

Part II

Planning and Control

The 5th Wave

By Rich Tennant



“Have someone in accounting do a cost-volume-profit analysis, run a variance analysis, and finish this Sudoku puzzle for me.”

In this part . . .

Accountants love to plan, so plan on this part covering methods for creating a budget and getting budgets to fit together. I also lead you through a pleasant discussion on overhead costs and why they're often misused or ignored in cost analysis. You say you want to learn about inventory and how that may generate your largest costs? Well, you're in the right place . . . er, part.

Chapter 6

What's the Plan, Stan? Budgeting for a Better Bottom Line

In This Chapter

- ▶ Seeing the master budget and its component parts
 - ▶ Appreciating the importance of budgeting
 - ▶ Planning production, sales, and cash
 - ▶ Working costs into the budget process
 - ▶ Assigning responsibility, using a budget as a guide
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You need accurate information to make smart decisions about your business. A well-planned budget may be most important piece of information you use.

Budgeting is a proactive process. It's the thinking person's accounting. You anticipate future outcomes and can maximize them. You anticipate problems and may be able to minimize or eliminate them. That's a lot better than operating in ignorance and reacting to events as they come up.

In this chapter, you look at budgets, consider how to anticipate costs, and work through some essential budget documents.

Brushing Up on Budgeting Basics

As you know, a *budget* is a financial plan that includes both financial and non-financial information. Its most obvious features are a projection of revenue (how much you anticipate selling) and expenses (how much you anticipate spending). The budget can also contain non-financial information, such as how many employees you think you need.

A budget is a forecasting document, but businesses use it as a financial control tool, as well. A *financial control* is a tool to monitor activities in your business. One control is to review spending and ensure that you don't exceed your budgeted spending. Often, a company (or a division or department within it) isn't allowed to spend more than has been budgeted.

Budgets cover a specific period of time, most commonly a year. And a budget looks into the future. Although you use historical information to put together your budget, the activities you plan happen in the future.

When you budget, you're in good company. Businesses and governments, both large and small, create budgets. So do millions of people.

Seeing the master budget and its component parts

A *master budget* is a summary of your financial plan and your operating plan. The master budget gives you a "big picture" and sets your course of action for an upcoming period. It's critically important.

- ✓ The *financial plan* (financial statements, really) is what you share with outside parties who need your budgeted information. The bank where you have a loan may want to see your financial budget. In some cases, a government regulatory agency may want to review your budget. If you manufacture food, the Food and Drug Administration (FDA) is the federal agency that regulates food. The FDA might want to review your budget. Financial information comes from three financial statements: budgeted balance sheet, budgeted income statement, and budgeted statement of cash flows.
- ✓ The *operating plan* (also known as the *operating budget*) is used internally. Imagine sitting in a meeting with your managers. Your managers need to understand how much they can spend this year and how they are allowed to spend it. Managers also need to understand how much money the company is forecasting as a profit. The projected profit affects the manager's sales plans. These details are contained in the operating plan. You hand out the operating plan to each manager, and the managers implement the plan.

The master budget is a comprehensive picture of your plans for the future and how the plans will be accomplished.



Operating plans can contain non-financial information. Decisions about production, hiring, and selling effort are components of operating plans.

Why budgeting is important

To put it simply, when you put together a budget, you determine how you plan to use your resources. *Assets* are resources; cash is the most famous asset. Other property, like vehicles, for example, are assets, too. The reason you spend cash for materials and labor is to earn money for your business. The reason you buy a truck for use in your business? Same thing: to earn money for your business.

In theory, you could sell all your assets. Of course, then you wouldn't have a business, but that's what happens when you dissolve a business — the assets are used to pay off the company's liabilities. A *liability* represents a "claim" on your assets. A claim means that someone has a potential right to your assets if you don't pay him or what you owe. A bank loan is a company liability. So are your utility bill and other bills you need to pay. If you don't pay your bills, the companies you owe could file lawsuits. A court might force you to pay. That's what is meant by a claim on assets.

A budget helps you forecast how much of your assets you use and how much revenue (sales) the asset generate. If you use your assets (resources) wisely, you increase your profit.

Assets such as trucks *depreciate*. They're worth a little less every day as you use them up. The more you drive your company trucks, the more costs you recognize. Note that you can budget for operating costs and depreciation, such as what you'll see with a truck.

Take landscapers as an example. Landscapers are a smart bunch. They drive the wheels off their trucks until maintenance costs become too great. They milk all the revenue they can out of an asset before disposing of it. It's simple: A load of steer manure doesn't care whether it's being driven to the jobsite in a brand-new dually with crew cab or a 15-year-old junker. You have choices about using resources. If you choose to use resources to make product A (and generate revenue), you're giving up the opportunity to use those same resources to produce product B (which would have generated revenue, too). This is called *opportunity cost*. You make the decision to produce either product A or B in your budget.

Opportunity cost is the decision to go one way instead or the other. It's mainly about deciding how to allocate resources. Opportunity cost confronts you when you look at your product line (what you plan to sell), your expenses, your vehicles, and so forth. It even operates when you choose which restaurant to go to on Saturday night. Maybe the pricey place is close by and the cheaper place is a long way away, so what do you do? Either option gives you something and costs something.

Your budget also helps you figure out product mix. How much of each product or service will you sell? Take a look at Chapter 3 to see how to use sales mix to reach a target level of income.

Cash flow is the cash inflows and outflows your business generates. When you produce a product or perform a service, you spend cash (cash outflow). When you're paid for a sale, you get cash (cash inflow). You plan sales in your budget. As a result, you plan cash inflow and outflows, too. The key cash flow question is this: Does my budget include enough cash inflows to pay the outflows?

If an accountant recognizes revenue based on cash inflows, he or she is using the *cash basis* accounting. Cash basis accounting recognizes expenses when you have a cash outflow. Most companies use the accrual method of accounting, which is different. Both of these methods are defined in the "Budgeting with Cash Accounting or Accrual Accounting" section, later in this chapter.

Planning strategically

Businesses generally plan for the long term. Occasionally, you get existential and ask, "What's it all about?" Your strategic plan has the answer.

A *strategic plan* is your business's road map to the future. The plan reminds you, your employees, and third parties what you do, how you do it, the customers you do it for, and maybe even how you will do it in a superior way. "It" means making jet fighter aircraft, selling chocolates in a mall, or whatever the business does.

The plan summarizes where the business is, where it wants to go, and how it's going to get there. In theory, everything you do day to day contributes to advancing the goals in the strategic plan. Everything you do can affect costs, profits, and company growth.

Your budget, of course, is an important part of strategic planning. The budgeting process forces you to think, make decisions, and come up with reasonable forecasts. You can't sidestep potential negatives, either. That would be like a farmer pretending that a drought doesn't exist.



In the world of startup businesses and bank loans, you generally hear the question "Do you have a business plan?" A *business plan* is very much the same thing as a strategic plan. You probably won't get venture capital (VC) money or a loan without a plan that assures the investor or lender of your credit-worthiness.

VC firms buy equity (ownership) in companies that are just starting out. The companies that VC firms invest in typically don't have a track record of sales and profits. VC firms take large risks, because the investment in a startup firm may be lost if the company fails. If the new business succeeds, the VC firm can earn a large rate of return on the investment. You may have heard the term "Go big or go home." That describes what a VC firm does.

Strategic planning begins in a practical way but quickly requires you to be a visionary. A good example is the late Steve Jobs, considered to be a great business visionary of the 20th and 21st centuries. Jobs was able to imagine the types of technology products customers wanted long before other people could. Apple created lots of innovative products based on Jobs's vision.



Strategic planning methods exist in abundance and seem to be a thriving cottage industry. They contain more letters than ten cans of alphabet soup, and include SWOT, PEST, STEER, EPISTEL, ATM, and RCA. Be cautious, and use common sense before embracing a planning methodology. *Strategic Planning For Dummies*, by Erica Olsen (published by John Wiley & Sons) is a great resource for this topic.

Planning How to Plan: Factors That Impact Your Budgeting Process

Planning is time consuming, but it pays off. There's no single difficult part, so the biggest challenges are to bring the right information to the game and use your head. Good information comes from your experience, what you know about timing, the facts and figures your staff gives, and what you judge about sales projections.

Experience counts

Business owners without much experience in an industry often plan poorly, in part because they don't have much personal history to go on. Also, some people have trouble accepting the reality of their business prospects. For example, they really want the business to grow 30 percent but can't accept the fact that 10 percent is more realistic.

I worked with three brothers who were opening a pizza-parlor franchise. The franchise was successful in other parts of the county. The brothers were opening a store in a new area of town. All good. None of the brothers had any

restaurant industry experience. Two of the brothers sold business envelopes, and the third was a professional golfer. Not so good.

The four of us did an analysis and determined that the profit margin was only 5 percent. That profit margin was so small that a seemingly insignificant change from the budget (budget versus actual) could result in a loss.

The brothers went forward with the business in spite of the small profit margin. They wanted to start their own business very badly, so they were willing to take the risk that it wouldn't succeed financially. After a few years, the brothers closed the business. The pizza parlor never generated enough profit to pay the owners a reasonable salary.

The pizza-restaurant owners planned poorly. They didn't have any industry experience. If they had, they might have realized that the profit level they were projecting was not realistic. If they had agreed that the projected profit was too low, they might have passed on opening the restaurant.

Timing is everything

Different business decisions have different timelines. Those timelines depend, in part, on the dollar amount of the decision you're making. Understanding your timeline will help you make intelligent decisions about spending.

For example, if you decide to use a different supplier for your materials, you could start buying materials from that company immediately. No problem. On the other hand, completing a move into a newly constructed building might take a year or more. You need to consider timelines for your more expensive business decisions. If you're building a new office, determine how long the construction will take. Based on the timeline, you can plan your payments for the building and how you'll generate cash to make the payments.

Explain your timeline in your business plan. If you're providing financial statements (discussed later in this chapter) for one year, you may need to explain payments for a building (asset) that isn't yet completed. It's perfectly reasonable to expect a business to pay for major assets over a long period. Just make sure that it's explained to your investors or lenders. You may have a one-year *operating* budget, along with a *capital expenditure budget* for three to five years. The capital expenditure budget is the big-things-I'll-buy-and-pay-for-long-term budget. This budget helps you and others visualize your long-term plans and spending.

People get you headed in the right direction

The budgeting process isn't just about numbers; it also involves people. Part of planning your business involves talking to people — lots of people! A budget is something that a group of people typically reviews and eventually comes to an agreement on. Involve people and get their opinions, or there won't be agreement on the budgeted results. If the company's managers don't generally agree on where you're headed in your budget, you may need to revise.

Talk to your staff. If you're concerned about wasting material in the manufacturing process, talk to people on the factory floor. Maybe you'll find out that poor quality is the reason some material is wasted during production. Maybe some denim you use to make jeans tears too easily and has to be thrown out. The problem isn't the employees; it's poor-quality material from a supplier. You may never find that out unless you spend some time on the factory floor.

Talk with the sales staff to plan sales for the year. Good salespeople know their clients. They may know about a client's purchasing plans for next year. They may even know a client's budget to buy your product! Also, a good salesperson might know the financial condition of the customer. If the customer's business is growing, he or she might buy more from you. If the business is in financial trouble, that might mean decreased sales.

Have a conversation with the accountant during planning. She knows how cash flow turned out last year. You can look at the data on how quickly you collected cash for sales. Also, your attorney will remind you of any legal issues that might generate expenses during the year. There may be costs for legal services or costs to settle litigation. Those costs require cash, and you need to include them in your plan.

When your budget is in good shape, you can present it to your staff and explain where the company is headed. They'll feel more confident knowing the company's direction and prospects.

Sales projections pay off

Sales projections help answer the question of how you earn a reasonable level of profit. Of course, the answer is complicated if there are competitors selling the same product or service, because it suggests you might have to lower prices to stay competitive. If you want to cut prices to attract business, you need to plan your costs so your profit level remains reasonable. Another possibility is to improve the design of your products and not change prices. If you do that, you add the cost of design to product costs. But increased sales without cutting prices may offset the cost of design.

Company goals, employee compensation

Ideally, your employees can connect your budget goals to their proposed salary increases and bonuses. I once sat in a sales meeting with a company president and his sales staff. The salespeople were paid a bonus based on their individual sales, regardless of overall company results. The president was paid a bonus based on company profits. It was early November, and the president was trying to determine if enough sales would come in before year end so the company could reach its profit goal (which would be good for the president).

Keep in mind that the additional business would need to meet an accountant's defini-

tion of a legitimate sale. If you'd like to know more, check out the book *Financial Accounting For Dummies*, by Maire Loughran (published by John Wiley & Sons).

I knew that none of the salespeople were close to meeting the sales level for bonuses. They had no motivation to bring in sales before the end of the year (which would be bad for them). They wanted to close sales and get credit in the following year, when they counted toward their next year's bonus. Needless to say, the salespeople stayed quiet. The president didn't connect the company's profit goals with the salespeople's compensation.

Good planning is useful, and poor planning leads to projections (of profit, sales, and company growth) that aren't useful. If you use unrealistic plans, you use assets in ways that won't maximize your profits. Simply put, you end up spending time and money on the wrong activities.

Say you're a homebuilder with a 50 percent growth in sales last year. This year's budget assumes a 30 percent sales growth. You don't take a lot of time to analyze that assumption; you just figure that because last year was great, and expected orders for the beginning of this year look promising, why not 30 percent? That's no method of projecting sales growth.

Part of the answer is market research. It's a marketing concept but may be useful here. Assume that you're selling running shoes in the United States. The first step is to determine the size of the market, and you find that 10 million people buy running shoes each year. On average, they spend \$80 for a pair. Fortunately, you've priced your shoes at \$78, so you're right around the average.

Next, you estimate that your firm can capture 10 percent of the U.S. running-shoe market. That means a total sales volume of 10 percent of a 10 million-unit market, or 1 million units sold in a year. At \$78 a pair, you project your sales to be \$78 million. Finally, you consider whether the market is growing or shrinking. If the running-shoe market is growing at 10 percent per year, you could reasonably increase your sales projection by 10 percent each year, also. Of course, market growth is impacted by the economy overall and the specific industry (sporting goods, in this case). Competitors may also impact your growth. All of these issues would need to be projected before coming up with a reasonable sales forecast.

The sales growth rate drives decisions about spending, employee hiring, and cash planning. If you're selling 30 percent more, you can plan to increase your spending and hire employees to manufacture 30 percent more of your product. You also probably can expect a 30 percent increase in cash inflow as a result of growth, too.

But wait! If a more careful review indicates 10 percent growth, your 30 percent projection creates some problems for you. You increased your spending and hiring assuming the 30 percent level, but the sales and cash inflows will only come in at 10 percent. Put simply, you're planning on spending 20 percent too much. Whether you're building homes or selling running shoes, the numbers still apply.

The Nuts and Bolts (and Washers) of Budgeting

Budgeting takes time. In fact, a well-designed budget can take a lot of time to create. The good news is that the process gets easier over time.

Begin by deciding what company entities require a budget. Also decide how detailed your budgeted data should be. The budget can be for the whole company, or maybe each of five company divisions should have its own budget. Maybe you want to produce budgets for each of three departments within each of the five divisions. The process takes time and involves people, so the benefit of having the budget must outweigh the cost of putting it together.

In budgeting, you begin with some assumptions. The assumptions are called *standard costs* and are the specific planned levels of cost and activity. For example, you might assume a standard labor rate (cost) of \$20 per hour for a sewing-machine operator. You might assume a standard material rate of \$75 per square foot for marble for kitchen countertops.

When you create your budget (based on reasonable assumptions) and start the year's business, you have actual costs and levels of activity to review. A difference between an actual cost and standard cost is a *variance* (see Chapter 7). A variance is a scorecard that tells you how close your budget assumptions were to actual results. Fortunately, you can make modifications to your budget to deal with variances.

Understanding the budgeting financials

Your budget becomes a set of *pro forma* financial statements. Pro formas are what-if statements, filled with budgeted, planned, and forecasted items. Unless you have a crystal ball, your budget is always a collection of educated best guesses about the future.

To keep things simple, there are three basic financial statements for budgeting: the balance sheet, the income statement, and the statement of cash flow (mentioned earlier in this chapter). Another aspect is an explanation of your source of funds.

Source of funds

Your budget determines if you have enough funds to run your business. Hopefully, you get all the money you need from selling products or services, but that's not always the case.

The *financial plan* (also loosely called the *business plan*) explains the source of funds to run the business. You can raise money by borrowing cash (debt) or by offering investors ownership in the business (equity) in exchange for cash.

If you borrow, you repay a creditor the original amount borrowed (principal) and interest on the loan, usually on a written schedule. The interest cost and principal repayment must be included in the budget.

You can also raise funds by selling ownership in your business, offering investors equity. Equity investors are rewarded in two ways: *stock appreciation* and *dividends*.

The most common way to sell ownership is to sell common stock. Investors expect you to explain (through your budget) how you plan to generate a profit for the year. If the company is profitable, the value of their ownership in your business increases. They could eventually sell their ownership interest to someone else for a profit.

You also need to think about whether or not to pay dividends. Dividends are a share of the profits earned by the company paid to equity investors. Of course, without any company earnings, you can't pay dividends.

Using the balance sheet

The *balance sheet* lists the company's *assets, liabilities, and equity* (essentially the difference between assets and liabilities) as of a certain date. Think of the actual balance sheet as a snapshot in time; think of the budgeted balance sheet as a pretty good estimate of the actual financial statement.

Liabilities are claims on your assets. A *liability* means that you owe someone money. Liabilities include items such as unpaid utility bills and payroll costs you have not yet paid. Future interest and principal payments on a loan are also liabilities. When you pay a liability, you use an asset (cash, in most cases) to make payments.

This gets you to the basic formula for the balance sheet:

$$\text{Assets} - \text{Liabilities} = \text{Equity}$$

I describe it this way: Assume you own a little shop. You sell all your assets — your inventory, furniture, and your building. You use the cash you receive to pay off all your liabilities — utility bills, payroll, and bank loan. Whatever cash is left after you pay off your liabilities is your equity. Equity is the true value of your business. Equity is the residual — after you use your assets to pay off all liabilities. So now you can see the logic behind the balance sheet formula: Assets less liabilities equals equity.

Working with the income statement

The *income statement* shows revenue, expenses, and net income (profit). For most business owners, the income statement is the most important report. The income statement shows if a business was profitable over a period of time (such as a month, quarter, or year), whereas the balance sheet shows assets, liabilities, and equity as of a specific date. The nice thing about modern accounting software is that it's pretty easy to instantly display and print an income statement. Think of the budgeted income statement as a pretty good projection of your company's sales, expenses, and profit.

The income statement formula is incredibly simple:

$$\text{Revenue} - \text{Expenses} = \text{Net Income}$$

Analyzing the statement of cash flows

The *statement of cash flows* analyzes your sources of cash (cash inflows) and your uses of cash (cash outflows) over a period of time. Cash flows are grouped into three categories: operating, financing, and investing activities. When an accountant puts together a cash flow statement, she reviews every transaction that affected cash. A very simple model is what's in your checkbook. If inflows are good, you probably have enough cash to operate. If the checkbook shows that you're overdrawn, outflows have exceeded inflows, and you've got trouble.

The goal is to assign every cash transaction to one of three categories, although most of your cash activity is in the operating activities section. I always suggest that people find financing and investing activities first because there are usually fewer transactions. The remaining transactions are operating activities.

The three cash flow categories are

- ✓ **Operating activities** occur when you run your business each day. You buy material, pay for labor, ship goods, pay interest on loans, and collect cash from customers.

- ✔ **Financing activities** occur when you raise money for your business, and when you pay lenders or investors. You receive cash when you sell equity, and you receive cash when you borrow. You pay cash when you pay dividends, and you pay cash when you pay down a loan (pay back some of the principal).
- ✔ **Investing activities** occur when you buy or sell assets. If you write a check for a new vehicle or receive cash when you sell equipment, those are investing activities.

The statement of cash flows lists the beginning cash balance; all the cash activity for the period, grouped into three categories; and the ending cash balance:

$$\text{Ending cash balance} = (\text{net cash flow of operating activities}) + (\text{net cash flow of financing activities}) + (\text{net cash flow of investing activities})$$

A simpler formula is

$$\text{Ending cash balance} = (\text{beginning cash balance}) + (\text{cash inflows for the period}) - (\text{cash outflows for the period})$$

The ending cash balance in the statement of cash flows equals the cash balance in the balance sheet (well, it's supposed to, anyway). For example, if the statement of cash flows is for March, the ending cash balance should equal the balance sheet cash balance for the last day of March.

When you create your budget, it should include all three financial statements (balance sheet, income statement, and statement of cash flows).

Reviewing revenue and production budgets

Revenue and production budgets, put simply, forecast how many units you plan to produce and how many units you plan to sell. For more info, check out the flow of manufacturing costs in Chapter 4.

Say you're budgeting to manufacture garage doors. You need to forecast how many sales you expect. Then you consider how many garage doors you already have in inventory and plan how many you need to manufacture to meet the sales forecast. Ta da! When you know the number of doors you need to make, you can budget for material and labor costs.

Direct costs are pretty straightforward, and you can use an activity level to assign indirect costs. See Chapter 5 for more on assigning indirect costs. Revenue, production, inventory, direct materials, direct labor, indirect costs (overhead), and cost of goods sold all are budgeted items.

Applying the revenue formula

Say you forecast selling 200 garage doors in March. Consider how many garage doors you need to manufacture. Assuming a sales price of \$300 per door, here's your revenue budget:

$$\text{Revenue budget} = 200 \text{ units} \times \$300$$

$$\text{Revenue budget} = \$60,000$$

Using the inventory formula

And now for the famous inventory formula:

$$\text{Ending inventory} = \text{beginning inventory} + \text{production} - \text{sales}$$

Your production will change based on how many garage doors you already have in inventory. So if you already have 75 completed garage doors in beginning inventory, it's clear that you won't need to manufacture all of the 200 units you plan to sell.

But wait! Do you want any garage doors in ending inventory? If you think you'll have orders during the first few days of the next month, you probably do. So maybe you decide on an ending inventory of 50 garage doors.

Take the inventory formula and calculate the garage door production you need. Assume x is production in units, and solve for x :

$$\text{Ending inventory} = \text{beginning inventory} + \text{production} - \text{sales}$$

$$50 = 75 + x - 200$$

$$x = 175$$

This simple algebra problem shows that production should be 175 units. Table 6-1 shows a production budget.

Table 6-1 Garage Door Production Budget			
<i>Cost</i>	<i>Quantity</i>	<i>Price</i>	<i>Total</i>
Direct material (wood)	80 square feet	\$1 per square foot	\$80
Direct labor (labor)	2 hours	\$25 per hour	\$50
Indirect costs allocated	1 hour	\$15 per hour	\$15
Cost per unit			\$145
	Units	Unit cost	Total cost
Production cost	175	\$145 (above)	\$25,375

The production budget includes direct materials, direct labor, and indirect costs (overhead). In this example, the indirect cost is allocated based on machine hours. Add the costs to get a unit cost. Then multiply units to be produced by the cost per unit. That amount is the total cost of production of \$25,375.

Assessing cost of goods sold

The goods you produce for customers end up in one of two places: You either sell them (cost of goods sold), or they're still on the shelf (finished goods inventory). Beginning inventory and production don't matter. For more info on cost of goods sold, see Chapter 4.

What costs should be attached to the goods you sell? How much did they cost to produce? (If you're a retailer, how much did they cost to get?) To continue with the garage door manufacturing example, assume that the first goods you sell are from beginning inventory. Because all 75 units of beginning inventory are sold, use a formula to determine how many units of the March production are sold:

$$\text{March production sold} = \text{total sales} - \text{beginning inventory}$$

$$\text{March production sold} = 200 - 75$$

$$\text{March production sold} = 125$$

Assume also that the cost per unit of beginning inventory is \$143. That cost is different from the March production cost of \$145. (Why the change? Because it seems like the costs of materials and labor to make a garage door go up all the time.) Table 6-2 displays the cost of goods sold budget.

	<i>Units</i>	<i>Cost Per Unit</i>	<i>Total Cost</i>
Beginning inventory	75	\$143	\$10,725
March production sold	125	\$145	\$18,125
Total	200		\$28,850

The total cost of goods sold is higher (\$28,850) than total production cost in Table 6-1 (\$25,375). That makes sense, because Table 6-1 deals only with producing 175 units. You sold 200 units, but 75 units were from inventory. Because of adjustments for beginning and desired ending inventory, you don't always need to produce in a month the number of units you sell in a month.

One more calculation. (There's always one more calculation.) Now calculate your ending inventory budget:

Ending inventory budget = units \times per unit cost

Ending inventory budget = $50 \times \$145$

Ending inventory budget = \$7,250

You've planned revenue, production, and inventory. Great! Now you need to figure out how to pay for it all. If you don't have a budget for an adequate cash amount to operate, you can't do business.

Budgeting with Cash Accounting or Accrual Accounting

Accounting was easier in the days of the cave dwellers. Og said to Gog, "I give you three spear points. You give me that deer." After that, accounting got more complex, and every civilization has kept business records in one form or another.

The credit for modern accounting goes to Italian mathematician Luca Pacioli, a Franciscan friar who hung out with Leonardo da Vinci. Pacioli developed double-entry accounting, which every business (except street merchants, and maybe some of those, too) uses.

There's a choice for small business: You can use cash basis accounting or accrual basis accounting. Both methods can be used for budgeting, but accrual is better and is used by all large organizations.

Cash basis accounting: Using your checkbook to budget

Cash basis accounting posts revenue and expenses to the financial statements based solely on cash transactions. Nothing happens until you take cash in or send it out. It's a simple way of doing things — no accounts receivable and no accounts payable.

By contrast, *accrual basis accounting* states that expenses are matched with revenue, regardless of when cash moves in or out of the checkbook. The accrual basis is a better method to account for cash, because revenue and expenses are matched more precisely. See the section "I accrue, you accrue, we all accrue with accrual accounting."

On a very basic level, your cash budget is a reflection of your checkbook. It's the sum of the deposits you make (revenue) and the checks you write (costs). The budgeting result of cash basis accounting is a *cash budget*.

Such a budget assumes that all your customers pay for sales in cash during the month of sale, and it assumes that you pay all costs during the month that the goods are sold. This is very unlikely for most businesses.

It's more likely that you write a check in February for materials for a product you sell in April. Similarly, you might pay an employee in December for work to make a product that's sold in January.

Assume you own a gift shop that sells greeting cards, flowers, and gifts. Your beginning cash balance for the month is \$100,000. Table 6-3 displays a cash budget for a gift shop.

	<i>Amount</i>
Beginning cash balance	\$100,000
Add customer payments for sales	\$50,000
Less:	
Inventory purchases	\$20,000
Payroll costs	\$10,000
Utilities costs	\$1,000
Lease cost	\$3,000
Ending cash balance	\$116,000

This cash budget has a \$16,000 increase in cash during the month (\$116,000 - \$100,000). You had \$50,000 in sales. If you hadn't collected any cash from customers during March, your cash balance would decrease by \$34,000, the total of all the cash outflows. If that happened, you'd start the next month with \$34,000 less cash. You need to consider if your April cash budget (next month) would work with a lower beginning balance in cash. You don't want to start in the red.

If you don't think you'll have enough cash for a period, you can consider how to get it.

The cash budget is similar to the statement of cash flows. Table 6-4 shows an example statement of cash flows for the gift shop.

Table 6-4 Gift Shop Budgeted Statement of Cash Flows

	<i>Amount</i>
Beginning cash balance	\$100,000
Cash flow from operations	\$16,000
Cash flow from financing	\$0
Cash flow from investing	\$0
Ending cash balance	\$116,000

Note that the beginning and ending cash balances in Table 6-4 agree with the cash budget (\$100,000 at the beginning and \$116,000 at the end). The cash flow calculation from operations is

Net cash inflow from operations = customer payments - cash outflows

Net cash inflow from operations = \$50,000 - \$34,000

Net cash inflow from operations = \$16,000

All the cash flows for the gift shop are related to day-to-day operations. None of the cash activity is related to financing or investing.

1 accrue, you accrue, we all accrue with accrual accounting

An effective budget applies the *matching principle*. The principle says you should match the timing of the expenses of creating and delivering your product or service with the timing of getting revenue from the sale. This is *accrual basis accounting* (as opposed to *cash basis accounting*).

Accrual accounting ensures that revenue is better matched with the expenses incurred to generate revenue. In simple terms, with accrual accounting you realize or recognize expenses when you incur them, not when you pay them. You realize revenue when you generate it, not when the customer pays.

When you create an invoice, the accounts receivable (A/R) system generates a *receivable*, even though the customer may not pay for, say, 30 days. When the payment comes in, the receivable *goes flat*, meaning it's been satisfied by the payment. Accrual accounting is considered to provide a more accurate reflection of business activity than cash accounting. By the way, the system still allows for straight cash sales — where you sell *now* and the customer pays *now*.

The same is true of purchases you make. When you buy now and pay later, you create a *payable*. When the bill comes and you pay it, the payable goes flat. Of course, the system allows you to make straight cash purchases — where you buy and pay your vendor *now*.

Say you manage a catering business. The food, preparation cost, and delivery expenses related to the Jones family reunion should be matched with the revenue from Jones family. Ideally, you want the expense and the revenue to be posted in the same time period. You wouldn't want the Jones expenses posted in March and the Jones revenue posted when they paid (say, in April). That's not the best reflection of your business activity.

The downside of accrual accounting is that your income statement revenue and expenses rarely match your cash inflows and outflows. You can be rich in receivables and darned poor in cash. All companies still prepare a cash flow statement even if they are using accrual accounting.

Budgeting to Produce the Income Statement and Balance Sheet

A final step is to create a budgeted balance sheet and budgeted income statement. Your balance sheet and income statement, whether budgeted or actual, are the two great financials. They are the bottom line, showing how you're doing.

The well-balanced balance sheet

Your balance sheet is a fine indicator of business health. Table 6-5 shows a pretty darned healthy balance sheet.

Table 6-5	Budgeted Balance Sheet
	<i>Amount</i>
Assets	\$100,000
Less liabilities	\$50,000
Equals equity	\$50,000

As you review your balance sheet budget, keep in mind the goal is to maintain enough assets to run your business, which includes production (if you make things), buying inventory (if you're a retailer), or employing people (for manufacturing, retailing, or service businesses).

The balance sheet should include assets needed for selling and distributing your products. Managing your business generates liabilities, too (accounts payable, long-term debt, and so forth). That's okay, as long as you have a plan to pay them.

If revenue doesn't supply you enough of the best asset — cash — you need a plan to raise capital. Capital represents an investment in your business. If a business owner invests \$20,000 into his business, the \$20,000 is considered capital for the business. That means you likely are either issuing debt or selling equity.

The incredible income statement

Most business owners are most interested in the income statement. The owner will typically plan this budget document first.

Table 6-6 shows a nice income statement.

Table 6-6	Budgeted Income Statement
	<i>Amount</i>
Revenue	\$50,000
Less expenses	\$25,000
Equals net income	\$25,000

Here's the thought process: You figure out how much revenue the company can generate. Then you subtract likely expenses from the revenue, and the result is your net income. After that, think about how cash will "move" (the cash flow statement) and where your company will get sufficient assets to operate (the balance sheet).

As you move forward in managing your business, don't be surprised if cash flow becomes the most important budget item for you. Without enough cash flow, not much can happen.

Chapter 7

Constant Change: Variance Analysis

In This Chapter

- ▶ Comparing static and flexible budgets
 - ▶ Recognizing variances and why they're important
 - ▶ Using variance analysis to improve financial performance
 - ▶ Analyzing price variances to make decisions about spending
 - ▶ Reviewing efficiency variances to improve productivity
-

In Chapter 6, you review how to set standard (budgeted) prices and rates in the planning process. You budget at the beginning of the year and then review your actual results at year-end. Don't be surprised when your actual results are different from your standards. That difference is called a *variance*.

When you budget, you necessarily make assumptions about total costs and levels of activity (also known as standard costs). *Standard costs* are based on projected prices and your planned levels of usage. If you manufacture blue jeans, you'll determine the hourly rate you need to pay workers. You'll also estimate the total number of hours they will work during the year. No one (not even giant corporations) has a crystal ball, so reality (actual cost) is guaranteed to vary from assumptions (standard cost).

Variance analysis amounts to a series of techniques used to spot changes that can happen on both the revenue side and the expense side. These changes can occur for practically any reason. For example, if a disaster affects sales, revenue goes down. If the cost of materials spikes unexpectedly, expenses go up.

Business is risky. You often see unfavorable variances, results that are poorer than you wanted. But sometimes results are better than expected, and you see favorable variances.

In this chapter, I introduce several types of variances methods. I go over the concept of management by exception. This concept raises red flags that call attention to business problems, including variances. I identify variances using a flexible budget. When a variance is found, I show how to determine if the variance is favorable or unfavorable.

When you can identify a variance and understand why it occurred, you can make changes in your business to improve your productivity and your profit. The end result for you is a new, better set of assumptions, which operate until you do another variance analysis.

Variance Analysis and Budgeting

A *flexible (flex) budget* adjusts for changes in activity. A *static budget* assumes that the sale price, volume of sales, and all costs are fixed. The static budget does not change with any level of activity (like production or sales). In most situations a flexible budget is more useful than a static budget. That's because your actual production and sales levels will likely be different from your budget.

Using management by exception to recognize large variances

Management by exception is a variance analysis method that identifies the largest variances between actual results and standard plans. The largest variances need fixing; they are a priority for you.

Say your company makes leather coats that use a plastic zipper. As you review your actual and standard costs for the month, you notice that the actual price you paid for zippers is 20 percent higher than your planned price. None of your other variances for cost or revenue is greater than 1 to 2 percent. Something's going on! The variance doesn't tell you what happened, but it prompts you to investigate.

Management by exception is the red-flag method of variance analysis, and that 20 percent variance in the zipper price is a big red flag. It's a large difference that you need to investigate. It's not only statistically significant, but also, if your product is tightly costed (a small margin in the price for profit), the price increase is eating into your margins.

The increase may have happened because of a product shortage, meaning that your usual supplier couldn't meet your needs, and you had to go to another supplier and pay a lot more. Find out why the exception happened so you can make changes to prevent such a variance in the future.

Possible changes might be

- ✔ Find a different zipper that won't be subject to a product shortage.
- ✔ Find a different supplier who has a bigger inventory of the zipper you need.
- ✔ Find a cheaper zipper.
- ✔ Consider whether your business strategy is effective or not. Assume your leather coat's budgeted cost is \$75. If your actual cost is getting higher, maybe the \$75 cost per coat isn't a realistic budget amount.

Seeing the problem in using a static budget

A *static budget* (also referred to as a *master budget*) is a summary of operating and financial plans. After the budget is created, it doesn't change with the level of activity (sales, production) in your business.

A static budget is the starting point for determining a reasonable profit for your business. But a static budget assumes one level of output that never changes. This can create problems that are fixed by using flexible budgeting.

Table 7-1 shows a static budget for a toy manufacturer.

	<i>Per Unit</i>	<i>Total</i>
Units sold		120 units
Revenue	\$45	\$5,400
Variable costs		
Direct material	\$12	\$1,440
Direct labor	\$8	\$960
Indirect (overhead) costs	\$6	\$720
Contribution margin	\$19	\$2,280
Fixed costs		\$1,200
Operating income		\$1,080

Your static budget assumes only one level of production: 120 units. But direct material, labor, and indirect (overhead) costs are variable costs. They change as production changes. (Actually, you should keep in mind that indirect costs can be fixed or variable.) If you produce more or less than 120 units, you will have a variance that is caused just by volume (production). In fact, there are three major types of variances you might come across:

- ✔ **Volume variance:** You produce more or less than planned. That may mean that you use more or less material than budgeted. You may also use more or less labor than planned.
- ✔ **Price or rate variance:** The price you pay for materials, or that rate you pay for labor costs, is different than what you budgeted.
- ✔ **Sales variance:** You sell more or less than planned.

Note an important difference: Volume variances are all about *usage*. Price or rate variances relate to the *price* you pay — regardless of how much you use.

Operating with operating income

Operating income is your profit from the day-to-day activities of running the business. A growing operating income is a measurement of a successful business. In Table 7-1, you subtract fixed costs from contribution margin to get operating income.

If you make toys, your operating income is derived from just toy production and sales. Other types of income are not considered operating income. If your company happened to sell a building for gain, that gain wouldn't be part of operating income. The gain on sale of the building is a line in the non-operating income section of the income statement.

Table 7-2 lists the actual results for toy manufacturing.

	<i>Per Unit</i>	<i>Total</i>
Units sold		100 units
Revenue	\$50	\$5,000
Variable costs		
Direct material	\$10	\$1,000
Direct labor	\$8	\$800
Indirect (overhead) costs	\$5	\$500
Contribution margin	\$27	\$2,700
Fixed costs		\$1,000
Operating income		\$1,700

There are some differences between Tables 7-1 and 7-2. The actual units sold were less than budgeted (100 versus 120 units). The actual sale price per unit was higher than planned (\$50 versus \$45). There were also some differences in costs per unit that generated a higher actual operating income (\$1,700 versus \$1,080 budgeted).

You can breathe a little easier. It appears that your new Malibu Margi Beach House and Fun Set is selling pretty well and costs a little less than you expected to produce.

Table 7-3 is a static budget variance breakdown for the toy company. It shows what happens when real-life results differ from planned results.

	<i>Actual Results</i>	<i>Variance</i>	<i>Static Budget</i>
Units sold	100 units	(20 units)	120 units
Revenue	\$5,000	(\$400)	\$5,400
Variable costs			
Direct material	\$1,000	(\$440)	\$1,440
Direct labor	\$800	(\$160)	\$960
Indirect (over-head) costs	\$500	(\$220)	\$720
Contribution margin	\$2,700	\$420	\$2,280
Fixed costs	\$1,000	(\$200)	\$1,200
Operating income	\$1,700	\$620	\$1,080

Talk about management by exception! There's a giant variance in actual versus budgeted operating income. That's a nice surprise, but be careful. Surprises can go both ways.

Understanding favorable and unfavorable variances

Variances can be *favorable* or *unfavorable*. If you understand the differences, you can take action and improve your business.

Keep in mind that Table 7-3 displays *static variances*. These are variances between actual results and the static budget, and they suggest that a static budget has some limitations.

A *favorable variance* increases your operating income over the planned amount. A favorable variance occurs when actual spending is less than budgeted. That's a good thing. Also, a favorable variance occurs when you sell more units than planned (budgeted). That's a good thing, too.

The flip side is an *unfavorable variance* decreases your operating income over the planned amount. When actual spending is higher than budgeted, the variance is unfavorable. Also, when actual sales are less than budgeted, the variance is unfavorable.

You always put the actual results on the left. To compute a variance, subtract the actual results (left) from the budgeted amounts (right). For example, here's how you compute the Table 7-3 revenue variance:

Revenue variance = actual revenue – static budget revenue

Revenue variance = \$5,000 – \$5,400

Revenue variance = -\$400

Because this is a revenue variance, a negative number is unfavorable. You sold less than budgeted. If actual revenue were higher than budgeted, you'd get a positive number (more revenue than planned). For revenue or sales variances, a positive number is a favorable variance.

Yes, but now you're asking, "What about a cost variance?" It's the same process. Take the actual costs (on the left) and subtract the budgeted cost (right):

Direct material cost variance = actual material – budgeted material

Direct material cost variance = \$1,000 – \$1,440

Direct material cost variance = -\$440

Because this is a cost variance, a negative number is good; you spent less than planned. A negative variance is a favorable variance that increases your operating income over the plan.

You treat contribution margin and operating income in the same way as revenue: More actual activity is better (favorable). The positive variances for contribution margin and operating income in Table 7-3 are favorable.

Opting for a flexible budget

A flexible budget adjusts or changes for different levels of activity (sales, production volume, and so forth). To me, this is more realistic.

It's very unlikely that your budgeted sales volume will match the actual results exactly. Whereas you create a static budget at the beginning of a period, you put together a flexible budget at the end of the period, when actual sales volume results are known.

Put another way, the flexible budget is what your static budget would look like if you had a crystal ball and knew the actual level of sales in advance. So now, to create your flexible budget, you take all the budgeted per-unit amounts from the static budget in Table 7-3 and multiply them by actual sales volume (100 units) rather than static budget sales volume (120 units).

Handling fixed cost in a flexible budget

Fixed costs hold true within a range of production. If you go above that range, you need to revise fixed costs as you need more capacity, and that's likely to cost more. Understanding *relevant range* is critical if you want to plan investments in assets.

For example, if you use a machine that produces up to 15,000 units of product a month, the fixed costs for that machine are constant — as long as you don't need to produce more than 15,000 units. If your production goes higher, you need to buy another machine.

Working a machine to capacity is a little like redlining the engine when you're driving your car. Your car can run at 7,000 rpm for only so long. In time, it will break down because it's not designed for that sustained level of use. The same is true for machines, tools, and equipment you use in your business.



You're probably familiar with the relevant ranges for the equipment your company uses. And you very likely know that overworked machine tools wear out, and welding rigs must be "rested" to prevent failure. Computer printers specify monthly duty cycles in their sales literature.

For a flexible budget, use the static budget amount of fixed costs. If you go above your relevant range, you'll need to rethink the fixed cost amount. Consider if you need to invest in more fixed costs to maintain your higher level of production.

In Table 7-3, that is \$1,200. To justify using the static budget amount, consider that actual production (100 units) was obviously within the relevant range for the static budget (120 units).

Reviewing the components of a flexible budget

The next two tables show two variances that you use for flexible budget analysis. Table 7-4 shows flexible budget revenue and costs.

	<i>Actual Results</i>	<i>Variance</i>	<i>Flexible Budget</i>
Units sold	100 units	None	100 units
Revenue	\$5,000	\$500	\$4,500
Variable costs			
Direct material	\$1,000	(\$200)	\$1,200
Direct labor	\$800	none	\$800
Indirect (overhead) costs	\$500	(\$100)	\$600
Contribution margin	\$2,700	\$800	\$1,900
Fixed costs	\$1,000	(\$200)	\$1,200
Operating income	\$1,700	\$1,000	\$700

The actual results column is the same as Table 7-3. The flexible budget column uses all of the per-unit revenue and cost amounts from Table 7-1 and multiplies each item by 100 units, the actual sales in units.

The variance column in the middle of Table 7-4 provides the *flexible budget variances*. For example, the flexible budget variance for revenue is \$500. Because that's a positive number for revenue, it's a favorable variance. Contribution margin and operating income are also favorable variances because their variance amounts are positive.

The direct material variance is (\$200). Because the number is negative for a cost variance, it's favorable. The actual cost of \$1,000 was less than the flexible budget cost of \$1,200. The overhead cost and fixed cost variances are favorable variances. The variance for operating income is \$1,000 favorable.

Now compare the differences between the flexible budget and your original static budget. This is called the *sales volume variance*. Remember that all of the per-unit revenue and cost amounts were the same between static and flexible budget. The only difference causing the variance is sales volume.

Table 7-5 shows a sales volume variance.

Table 7-5 Toy Manufacturer — Sales Volume Variance

	<i>Flexible Budget</i>	<i>Variance</i>	<i>Static Budget</i>
Units sold	100 units	(20 units)	120 units
Revenue	\$4,500	(\$900)	\$5,400
Variable costs			
Direct material	\$1,200	(\$240)	\$1,440
Direct labor	\$800	(\$160)	\$960
Overhead costs	\$600	(\$120)	\$720
Contribution margin	\$1,900	(\$380)	\$2,280
Fixed costs	\$1,200	none	\$1,200
Operating income	\$700	(\$380)	\$1,080

If actual sales volume is less than planned, you have an unfavorable variance. Also note that revenue, contribution margin, and operating income amounts are all less than planned. As a result, each of these items has an unfavorable variance also. The sales volume variance in total, the variance for operating income, is \$380 unfavorable. You see the impact of selling less than you planned.

The formula for static budget variance is

$$\text{Static budget variance} = \text{flexible budget variance} + \text{sales volume variance}$$

$$\text{Static budget variance} = \$1,000 + (\$380)$$

$$\text{Static budget variance} = \$620$$

Keep in mind that the numbers are taken from the operating income variance at the bottom of each table. A \$620 static budget variance is a favorable variance because it relates to income.

Investigating budget variances

Just like it says on the first page of this chapter, when you understand why you have a variance, you can make changes in your business to improve your productivity and your profit.

There are some likely reasons for variances, so after finding variances, you need to put on your thinking cap and figure out the causes.

Seeing the cause of a flexible budget variance

To understand why you have a flexible budget variance, keep in mind that both actual and flexible budgets use actual units sold. This means that the variance can't be due to a difference in units sold; the variance must be due to something else. There are two likely causes:

- ✔ **Price per unit:** The \$50 actual price per unit is higher than the \$45 flexible budget price per unit. The static budget prices and costs are used for the flexible budget. So what happened? Maybe you decided to raise your actual price, based on customer demand or competitor pricing. You were able to sell the same number of units (100 units) at a higher sales price! As a result, the revenue variance is a \$500 favorable variance.
- ✔ **Costs per unit:** Note the \$10 actual direct material cost per unit is lower than the static budget material cost of \$12. The actual overhead is also lower than budgeted overhead cost (\$5 versus \$6). The material variance (\$200) and overhead variance (\$100) are both negative. For cost variances, a negative number is a favorable variance.

Considering reasons for a sales volume variance

Analyzing sales volume variances is easier than analyzing flexible budget variances because the differences in the flexible budget and static budget are due only to the difference in sales. You use this analysis to see the impact of sales on other areas of your business.

In the toy manufacturing examples, the flexible budget was prepared with 100 units sold (actual sales). The static budget assumed 120 units sold.

The per-unit revenue and costs are the same for both actual and flexible budgets. Here are the primary reasons why actual sales may be lower than the static budget:

- ✔ **Product demand:** Overall product demand has declined. All sellers of the product (including you) see their sales go down.
- ✔ **Competition:** Increased competition has reduced your sales volume. Some customers now feel that your price is too high when compared with your competitors'.
- ✔ **Quality:** Clients are buying less because of a concern about product quality.
- ✔ **Unrealistic budget:** The per-unit budget numbers from the static budget don't reflect actual costs and accurate product prices.

The same previously listed factors can explain *higher* actual sales as well. For example, less competition, higher demand, or reduced competition can increase your sales.

Demand and competition are broader concerns. They relate to the outside world, such as events that are happening outside of your company. As a result, you have less control over demand and competition.

Quality and budgeting are areas that you can change more easily. You can improve the quality of your product or service. You can also do more research and improve the accuracy of your budgeting process.

Analyzing in Material Price and Efficiency Variances

This section separates material variance analysis from labor variances analysis. You find that your material variances are caused by differences in price (how much you pay) and by differences in usage (how much you use in production).

There is a similar pattern with labor variances. A labor price (rate) variance occurs when your actual price paid per labor hour is different from your plan. A labor efficiency variance occurs when you use more or fewer labor hours than planned.

If your analysis is more specific, you make better decisions. Those decisions help you reduce your costs or even eliminate them.

A *price variance* is the difference between actual and budgeted price for something you purchase. Here's the formula for price variance:

$$\text{Price variance} = (\text{Actual price} - \text{budgeted price}) \times (\text{actual quantity})$$

An *efficiency variance* is the difference between actual and budgeted quantities you purchased for a specific price. Here's the formula for efficiency variance:

$$\text{Efficiency variance} = (\text{Actual quantity} - \text{budgeted quantity}) \times (\text{standard price or rate})$$



A standard is a planned amount per unit. Note that there are two terms in the efficiency formula: standard price and rate. This is a distinction you need to remember for cost accounting. *Standard price* refers to material variances. You pay a certain price for materials. *Standard rate* refers to labor variances. When you pay an hourly rate, you're working with labor variances.

To summarize the distinction between the two variances, you either *paid* more or less than planned (price variance) or *used* more or less than planned (efficiency variance).

Applying price variances to direct materials

An obvious way to reduce your costs is to analyze the prices you pay for materials. Say you operate a bicycle factory, and you use aluminum to manufacture bike frames. During planning, you come up with a standard or budgeted price of \$5 per pound for aluminum. When you review your actual costs, you find that the real price paid was \$5.75 per pound. Assume you purchased 10,000 pounds of aluminum. Table 7-6 shows your material price variance for the year.

<i>Actual Quantity</i> × <i>Actual Price</i>	<i>Actual Quantity</i> × <i>Budgeted Price</i>
10,000 lbs.	10,000 lbs.
Multiply by \$5.75	Multiply by \$5.00
Equals \$57,500 (A)	Equals \$50,000 (B)
Material price variance (A) – (B) \$7,500	

The material price variance is \$7,500 unfavorable because your actual costs (\$57,500) were more than the actual quantity at budgeted price (\$50,000). The only difference in this variance is the price paid for aluminum.

Applying efficiency variances to direct materials

Another way to improve your business performance is to be more efficient — “to work smart,” as the business cliché goes.

Looking at budgeted input quantity

During planning, you also determined a *budgeted input quantity allowed for actual output* of 12,000 pounds of aluminum for bike production. (Wow! That’s the longest title for a concept in this whole book.) This term multiplies the number of units you plan to produce by some amount of material per unit. This is the calculation for amount of aluminum for the bikes:

Budgeted input quantity = budgeted units produced \times lbs. used in a unit

Budgeted input quantity = $2,000 \times 6$

Budgeted input quantity = 12,000

To produce 2,000 bikes, you plan to use 6 pounds of aluminum per bike, or a total of 12,000 pounds. Assume that for the same 2,000 bikes produced, you used only 5 pounds of aluminum per bike (because you were so efficient, of course). This means that you only used 10,000 pounds of aluminum. Your material cost would be lower, which would increase your operating profit.

Table 7-7 shows your material efficiency variance for the year.

<i>Actual Quantity</i> \times <i>Budgeted Price</i>	<i>Budgeted Quantity</i> \times <i>Budgeted Price</i>
10,000 lbs.	12,000 lbs.
Multiply by \$5.00	Multiply by \$5.00
Equals \$50,000 (A)	Equals \$60,000 (B)
Material efficiency variance (A) – (B)	
(\$10,000)	

A negative variance for a cost is favorable, so the material efficiency variance is favorable.

Look back at the price and efficiency variances in the last two tables. Here's the flexible budget variance calculation for direct materials:

Flexible budget variance = price variance + efficiency variance

Flexible budget variance = \$7,500 + -\$10,000

Flexible budget variance = -\$2,500

You have a \$7,500 unfavorable price variance and a \$10,000 favorable efficiency variance. Because this is a cost variance, a negative number indicates less actual spending than planned, and that's a good thing.

Laying out reasons for price and efficiency variances

The real reason you go through all of this analysis is to identify areas where you can improve. By "improve," you want to reduce costs, increase demand, or raise prices to generate a higher profit.

Here are some reasons you might find a material price or efficiency variance:

- ✔ **Material purchasing decisions:** You're able to negotiate a lower price per unit. You may find a new supplier with a larger supply of material. To reduce their inventory, that supplier may be willing to sell at a lower price. These decisions may create a favorable material variance. On the other hand, a shortage of the material in the marketplace may mean that you pay more for materials. The additional spending may create an unfavorable variance.
- ✔ **Personnel and hiring decisions:** Due to a slow economy, you're able to hire workers with the skill set you need, but for a lower hourly rate. Also, you may have a staff that's so productive they get work completed faster than you planned. Finally, you're able to plan production so that workers don't wait during setup time. Less setup time means more hours producing the product. Of course, higher wages, less productivity, and poor decisions may create an unfavorable variance.

Implementing price variances for direct labor

Use your price variance knowledge to improve operations. You manage a lamp manufacturer (you're done with leather coats, toys, and bicycles). You hire employees to run machinery and also perform more delicate tasks by hand.

During planning, you come up with a standard rate (the hourly pay rate) of \$25 per hour. Your actual labor rate is \$22 an hour. During the year, you use 20,000 hours of labor to produce lamps. Table 7-8 shows your labor price variance for the year.

Table 7-8 Labor Price Variance — Labor Hours for Lamps

<i>Actual Quantity</i> × <i>Actual Price</i>	<i>Actual Quantity</i> × <i>Budgeted Price</i>
20,000 hours	20,000 hours
Multiply by \$22	Multiply by \$25
Equals \$440,000 (A)	Equals \$500,000 (B)
Labor price variance (A) – (B) (\$60,000)	

A negative variance for a cost is favorable, so the labor price variance is favorable. The actual labor price (hourly rate) was \$22, versus \$25 budgeted. The actual quantity of hours is the same in both calculations.

Sizing up efficiency variances for direct labor

You can easily get a sense of whether your staff is efficient. Calculate budgeted input quantity allowed for actual output. Assume that you plan to use 7 hours of labor per lamp, and you actually produce 3,000 lamps. This is the labor hours needed to produce lamps:

$$\text{Budgeted input quantity} = \text{budgeted units} \times \text{hours per unit}$$

$$\text{Budgeted input quantity} = 3,000 \times 7$$

$$\text{Budgeted input quantity} = 21,000$$

To produce 3,000 lamps using 7 hours of labor per lamp, you expend 21,000 hours of labor (see Table 7-9).

Table 7-9 Labor Efficiency Variance — Labor Hours for Lamps

<i>Actual Quantity</i> × <i>Budgeted Price</i>	<i>Budgeted Quantity</i> × <i>Budgeted Price</i>
20,000 hours	21,000 hours
Multiply by \$25	Multiply by \$25
Equals \$500,000 (A)	Equals \$525,000 (B)
Labor efficiency variance (A) – (B) (\$25,000)	

You end up with a favorable flexible budget variance of \$25,000 for direct labor (hours):

$$\text{Flexible budget variance} = \text{price variance} + \text{efficiency variance}$$

$$\text{Flexible budget variance} = -\$60,000 + -\$25,000$$

$$\text{Flexible budget variance} = -\$85,000$$

The (\$60,000) price variance comes from Table 7-8, and the (\$25,000) efficiency variance) comes from Table 7-9. Together, they yield a (\$85,000) favorable flexible budget variance. Because this is a cost variance, a negative number indicates less actual spending than planned.

Using Your Findings to Make Decisions

The reason you analyze variances is to take action and reduce your costs. This section goes over the process of decision-making as it relates to variances. You decide when a variance is large enough to be considered important. The term accountants use for important is relevant.

In addition to lowering costs, you'll use variances to improve your entire production process. For instance, identifying a variance may help you reduce the number of defective products you produce. Successful companies make improvements continuously.

Your variance decisions lower your costs, improve your production process, and increase your profits.

Following up on variances

If you think investigating a variance is tough, try ignoring one sometime. Yes, following up takes time and may involve phone calls, discussions with your staff, or additional research into supplier relationships. But if the variance is relevant, you gotta do it.

Researching the relevant

In accounting, you see the term *relevance* used frequently. Relevance refers to something that's worth noticing. You need to decide what variances are important to you.



Here's some simple advice: If a variance amounts to a big percentage difference between actual results and plan, or if it amounts to a big out-of-pocket cash difference, you should investigate.

No waffling on the impact of defective products

If you produce defective products, you're spending production costs on goods that cannot be sold to customers. As you find later in the book, you may be able to repair the product and sell it, but that will require more costs, too. So defective products result in unfavorable cost variances. You spend more than you planned.

You also may see a decline in sales, as unhappy customers stop buying your product. The sales decline means an unfavorable sales variance. You sell less than you planned.

A defective product will kill you ten ways to Sunday. Any defect in any product qualifies. The impact won't be good. The first thing you don't need is diminished sales, and the last thing you need is dozens of bad comments on a consumer website.

This isn't just a matter of a cost accounting variance. A defective product is the core of ruined image, publicly aired complaints, and a general undermining of confidence in your entire product line.

Simple advice is for you to look at the defect, find the cause, correct the cause, and make things right with your customer base. And for that matter, take what steps are necessary to reduce the chances of producing defective products in the future. The time investment is worth the effort.



You don't have to spend a lot of time on the Internet to find stories about companies that were seriously damaged by making defective products and failed to handle the problem.

Picking a minimum dollar amount or percentage

For variances other than serious product defects, pick a dollar amount or percentage as a big red flare. That is, choose a guideline for investigating variances.

Say you're making watches. It doesn't matter whether you put out costly Rolex watches at \$15,325 or inexpensive Casio watches at \$6.95. Each line suggests a guideline for concern.

You might decide that a variance of 10 percent or more from your standard amount is an issue. If your standard direct materials cost (cost \times quantity) is \$50,000, a variance, either favorable or unfavorable, of \$5,000 or more ($\$50,000 \times 10\%$) should be reviewed. The same is true if your standard direct material cost is \$5,000,000. It's still 10 percent or more.



My personal opinion is that big-ticket items can absorb a variance better than small-ticket items. An affluent customer base is likely to accept price increases, which overcomes variances. The economic law is that consumers buy more of a good when its price is lower and less when its price is higher; however, that law doesn't seem to apply to luxury items.

Keep in mind that the standards you create in planning (costs, quantities, and so forth) are *only* an estimate. You can expect some difference between standard and actual amounts. You don't have a crystal ball to get the standards exactly right. Finally, your company should include the guidelines for variance investigation in your written accounting procedures. That way, everyone in your organization knows the ground rules for variances.

Moving on to continuous improvement and benchmarking

Continuous improvement is the process of continually improving your efficiency and thereby reducing costs over time. By reducing costs a small amount each year, you increase your profit over time. You can find areas to reduce costs by investigating variances.

Over time, it may be more difficult to find cost reductions. As with many things in life, you try to do the easy fixes first; you make those changes that are obvious. As time goes on, the changes make your production more efficient. Finding new changes gets harder, but great companies stay at it. They make the effort to find more ways to reduce costs without sacrificing product quality.

If you want to compete, it's a good idea to compare your performance to other companies in your industry. *Benchmarking* is the process of comparing your company's performance to that of similar companies. That performance could mean many things: how quickly you deliver a service or how well you produce a product that minimizes defects. If you do competitive benchmarking, you're in good company. Some of the largest corporations in the world have such programs.

The purpose of benchmarking is to suggest areas where you can make improvements. If, for example, you can produce and deliver a product faster or reduce costs without affecting product quality, your company can be more profitable.

What you measure relates to what you do. If you're in a service industry, you might benchmark how quickly you do things: how long a customer waits in line at your store or how quickly can you make a home delivery.

If you manufacture products, you might benchmark product quality. *Quality* might mean tracking the number of product defects or the percentage of sales that are returned by customers.

Judging the effectiveness of your employees

Variance analysis is one criterion you can use to evaluate employees (but of course it shouldn't be the only one).

As mentioned earlier, all of your managers should participate in the budget process. After your planning is complete, each manager should receive a budget for his or her department. A good manager communicates the budget expectations to each employee. So everyone should be in the loop on the budget plans.

If the budget expectations are communicated effectively, you can use variance analysis to assess the performance of your employees. That's the purpose of this section.

Evaluating the purchasing manager

Good decisions by your purchasing manager can create favorable material price variances. If she purchases well, you may pay a lower material price, which can create favorable price variances.

The good purchasing manager not only makes good choices, but also tries to avoid bad choices. There are several key factors in making sound purchases:

- ✔ A low price is a low price if there aren't any strings attached.
- ✔ Quantity pricing can be a good thing in the short run. However, when you buy more, you're out of pocket more cash. And in the long run, there are other concerns. For example, the manager may have paid a lower price by buying more material than was needed. Eventually, you need to move that excess material into production. In the meantime, you have to store it somewhere.
- ✔ A reliable supplier is important. A good supplier should offer a quality product, in the quantities you need, delivered in a timely manner, at a reasonable price. The grass is not always greener on the other side of the fence. If you change suppliers to get a lower price, you may not get the same level of quality. You also might not get the same supplier response time when you need to resolve a problem.
- ✔ The quality of the material is vital. You often pay a price for buying cheap stuff, and you may ultimately spend more money than you save. Just think blemished leather, poorly produced denim, contaminated chemicals, and impure metal. Poor quality can result in waste, costly redos, or (worst case) defective products. Maybe most important, you may lose a client who is upset about the defective product or poor service.

If you're evaluating an employee, make sure it's based on the long-term result of their decisions, not a short-term gain to create a favorable variance. Short-term decisions to create favorable variances may create more cost and less profit in the long term. (Note that new CEOs at big corporations do this all the time, sometimes to the detriment of their companies.)

Here's another issue: Managers may set standards (budgeted amounts) artificially low. After all, they're being evaluated on outperforming a variance. If variance outcomes are only part of the evaluation, your staff won't be tempted to create unrealistic standards.

You may need to apply variance in evaluating your market research, design, and marketing departments. Customer tastes change, and your products may not be attractive to a retailer. The retailer may decide to buy less of a product (or not buy the product at all) because customers aren't interested. You might have a sales volume variance because actual sales to retailers are less than plan. (Technology products are great examples. That industry requires manufacturers to constantly change product design to meet customer demands.)

Tying supply chain concepts to variance analysis

A *supply chain* is the flow of goods, services, information — and, most important, costs — through a company. It's the entire process, from buying direct materials to delivering a completed good or service to the customer. Here is a simple supply chain:

Supplier to manufacturer to retailer to customer

You can envision how costs move through this chain.

Just in time manufacturing (JIT) is obsessed with shortening the supply chain. There are many benefits to JIT, and the methodology certainly reduces carrying costs for in-process inventory. Carrying costs represent the cost to store inventory. Not only do you need storage space for inventory, but you also need to insure it against damage or theft. However, it's a highly orchestrated ballet that might give you ulcers.

Attaching ABC costing concepts to variance analysis

You can allocate costs at different levels: unit level, batch level, and so forth. A batch is a group of units, just like a batch of cookies you bake in the oven. You can analyze how you produce batches (for example, batches of a simple, high-volume product compared to batches of a complex, low-volume product) and possibly reduce your costs. That's better than spreading costs uniformly, which can result in distortions.

Say you make glass bottles. You're in a great environment for cost allocation by batch. A machine shapes the glass into bottles and imprints your logo. Your static budget assumes that the cost of loading and unloading bottles is allocated based on a batch of 50 bottles. Table 7-10 shows an analysis of your loading costs.

Table 7-10 Glass Bottles — Labor Cost Allocation by Batch

	<i>Actual</i>	<i>Static</i>
Bottles produced (A)	10,000	12,000
Batch size (B)	50	48
Batches produced (A × B)	200	250
Labor hours per batch	3	2.5

	<i>Actual</i>	<i>Static</i>
Total labor hours (C)	600	625
Cost per labor hour (D)	\$22	\$21
Total labor costs (C × D)	\$13,200	\$13,125

You have just traced labor costs at a different level in cost hierarchy. Instead of tracing costs to a unit, you've traced costs to a batch.

Applying a flexible budget

It's not hard to apply flexible budget techniques to a batch. When you know how to apply the per-unit static budget amount to actual production, it's a short step to applying the per-batch static budget amount to actual production.

Table 7-11 calculates flexible budget cost.

Table 7-11 Glass Bottles — Flexible Budget Calculation	
Actual units	10,000
Divide by static batch size	48
Equals number of batches	208
Multiply by static labor hours per batch	2.5
Equals flexible budget labor hours	521
Multiply by static labor rate per hour	\$21
Equals flexible budget labor cost	\$10,938

Putting price and efficiency variances together

The best way to reduce costs is to analyze multiple variances (in fact, analyze as much data as you can). You see labor price and efficiency variances in tables earlier in the chapter. Now apply the concepts at the batch level.

Table 7-12 is a labor price variance calculation; Table 7-13 is a labor efficiency variance.

Table 7-12 Glass Bottles — Labor Price Variance	
<i>Actual Quantity</i> × <i>Actual Price</i>	<i>Actual Quantity</i> × <i>Budgeted Price</i>
600 hours	600 hours
Multiply by \$22/hour	Multiply by \$21/hour
Equals \$13,200 (A)	Equals \$12,600 (B)
Labor price variance (A – B) \$600	

Because the price variance relates to cost, the negative variance of \$625 is favorable. You spent less than planned in the static budget.

Table 7-13 Glass Bottles — Labor Efficiency Variance	
<i>Actual Quantity</i> × <i>Budgeted Price</i>	<i>Budgeted Quantity</i> × <i>Budgeted Price</i>
600 hours	625 hours
Multiply by \$21/hour	Multiply by \$21/hour
Equals \$12,600 (A)	Equals \$13,125 (B)
Labor efficiency variance (A – B) -\$525 Favorable	

The negative labor cost variance is favorable. You spent less than planned. Now calculate the flexible budget variance:

$$\text{Flexible budget variance} = \text{price variance} + \text{efficiency variance}$$

$$\text{Flexible budget variance} = \$600 + -\$525$$

$$\text{Flexible budget variance} = \$75$$

Chapter 8

Focusing on Overhead Costs

In This Chapter

- ▶ Understanding how overhead relates to other company costs
- ▶ Working with differences between fixed and variable overhead
- ▶ Applying variance analysis to overhead costs
- ▶ Reviewing typical fixed overhead cost variances
- ▶ Assessing variances in variable overhead costs

Indirect costs, also referred to as *overhead*, can be fixed or variable. For example, the salary of a foreman who manages the factory floor is a fixed overhead cost because the total cost does not change. Trucking costs to ship products to customers is a variable overhead cost. That's because shipping costs do change, depending on your production and sales. Both types of costs, however, relate to production. That's why both costs are considered overhead that is allocated to the cost of your product.

This chapter looks at how fixed and variable overhead costs are calculated and how you can use variance analysis (see Chapter 7) to reduce your costs and increase your profit.

Using Cost Allocation to Minimize Overhead

Most company managers don't spend enough time or thought correctly analyzing overhead costs; they have to think carefully about the activities that cause them to incur these costs. Because this process is time consuming, managers tend to rush the process of allocating costs. As a result, the costs aren't assigned to products properly. If the cost allocation isn't correct, there could be a problem in interpreting the true cost and profit margin of a product.

The best way to manage an overhead cost is to analyze it frequently. That way, you can start removing (or reducing) the cost sooner. Also, think carefully about new overhead costs, such as factory utility costs or an equipment lease, before you start incurring them!

A phrase to keep in mind for overhead costs is “Do only what you need to do to produce your product or deliver your service.” Accountants also use the phrase *essential costs*, or costs that add value. Recall that overhead costs are *allocated*, not *traced*, like direct costs (see Chapter 2 for more). Because you allocate costs, it’s difficult to get at how much overhead you really need in your business.

When you incur an overhead cost, it can be difficult to stop paying it! For example, if a fixed overhead cost is an employee, ending that cost by terminating the employee can be complicated. There are legal issues and human resources issues. And there are your own emotions to consider. A decision to let someone go is challenging.

If your variable overhead cost to repair machines is based on a contract, removing that cost is another legal issue. You may need to consult an attorney to determine when and how to end the contract.

In Chapter 5, I define a cost allocation base. To put it simply, the *cost allocation base* defines how you determine the amount of cost you assign; it’s your yardstick (or your tape measure) for costs.

The most common cost allocation base is to use labor hours or machine hours worked during the period. Assume you calculate a cost allocation rate of \$5 per machine hour for repair overhead. You then multiply the allocation rate of \$5 per hour by the number machine hours worked to make a product. That amount is your total repair overhead cost allocated to the product.

The following sections show you how to connect the cost allocation process to other overhead costs.

Paying for the Security Guard: Fixed Overhead Costs

Fixed overhead costs are costs that stay the same even as the level of activity changes. Your goal is to reduce fixed overhead costs and generate more profit.

Planning fixed overhead costs

The name of the game for overhead is to look at the activities that cause you to incur cost and decide if those activities are necessary for production. This section discusses planning techniques that can prevent and remove unnecessary fixed overhead costs.

Scheduling overhead costs reduces the chance that you'll pay more because of an emergency. For example, a well-managed manufacturer schedules repair and maintenance on the machinery, because it's better to maintain equipment rather than to fix it when it breaks down. Follow a program of *scheduled maintenance* (also known as *preventive maintenance*) to keep equipment running in top condition. If you're running production around the clock to fill an order, you don't want to lose time waiting for a machine to be fixed.

Scheduling your fixed overhead costs



You can use a schedule to reduce your costs and stick to your spending plan. Reducing your costs should help you maintain a reasonable profit level. When you maintain a schedule, you avoid spending money without fully considering the consequences.

You make better decisions about spending when you plan your spending. Buy only what you need to buy, and if possible, buy office supplies and similar items on a schedule.

At the least, develop a purchasing process. For example, perform a monthly review of your office supplies. Based on that review, make a month-end purchase of what you need. One monthly purchase will reduce the likelihood of frequent, unplanned impulse buys of items you don't really need.



I'm not much of a shopper. When I need to go to the mall, I find what I want online, call the store to see if they've got it, go buy it, and leave. My process eliminates the temptation to impulse-buy. I don't walk by something and buy it without any plan to do so.

Considering capacity needs

Any asset that you own (equipment, machinery, vehicles, and so forth) has a limit on its use. For example, a car can operate well for only so long. At some point, repairs become excessive. A machine can produce a product only for a certain number of hours per day. That's the *capacity or duty cycle*. If you try to operate beyond that level, similar to the car, the machine — or *asset* — eventually breaks down.

Relevant range defines the maximum amount that you can produce using the asset. Jump to Chapter 2 for more info. Obviously, when you plan fixed overhead costs, you need to consider the relevant range of your assets.



Capacity planning is the process of figuring the production capacity you need to meet changing demand for your products. You must have the necessary assets in place to meet production requirements. Assume you need to produce 20,000 shirts for the month. If your machinery can produce only 15,000 shirts, you've got trouble. But you have choices, each one with consequences.

You could buy or lease another machine (which costs some money), or you could turn away some business (which means less revenue). Maybe you find another manufacturer who can help fill the orders (which means more costs to you). As is often attributed to economist Milton Friedman, "There ain't no such thing as a free lunch." The better you anticipate production requirements, the better the decisions you make.

Allocating fixed overhead costs

The more accurately you allocate fixed overhead costs, the more accurately your product's total costs are reflected. If total cost is accurate, you can add a profit and calculate an accurate sale price. To more accurately allocate fixed overhead you use cost pools and cost allocations to compute a cost allocation rate (see Chapter 5).

Computing a cost allocation rate

Say you make car tires. Your cost pool for fixed overhead includes machine depreciation, utility costs, and salary costs for your security guard. The annual budgeted costs total \$120,000, and you have 20,000 total machine hours budgeted. Use these formulas and these numbers to compute your cost allocation rate:

$$\text{Budgeted cost allocation rate} = \$120,000 \text{ cost} \div 20,000 \text{ machine hours}$$

$$\text{Budgeted cost allocation rate} = \$6 \text{ per machine hour}$$

You determine that a budgeted quantity per unit (per tire) is 30 minutes. Here is your budgeted fixed manufacturing overhead cost per unit:

$$\text{Fixed overhead cost per unit} = .5 \text{ hours per tire} \times \$6 \text{ cost allocation rate per machine hour}$$

$$\text{Fixed overhead cost per unit} = \$3$$

Each tire has direct costs (steel belts, tread) and \$3 in fixed overhead built into it.

Applying actual costs and the static budget

Take the total cost pool of \$120,000 and simply divide it over 12 months. Your monthly static budget is $\$120,000 \div 12$ months. That's \$10,000 per month.

Calculating flexible budget variances

You can now calculate a *fixed overhead flexible-budget variance* (sometimes referred to as a *spending variance*). A flexible budget changes as activity levels (sales, production) change. Because fixed costs do not change within a relevant range, there is no adjustment of budgeted fixed costs from a static to a flexible budget. This holds true as long as actual costs are within the relevant range.

Bad news. The static budget simply took the annual cost pool amount of \$120,000 and divided by 12 months. But say total actual costs for April are \$11,000. You have a variance, and it is not favorable. Here's the formula:

Fixed overhead flexible budget variance = actual cost – static budget

Fixed overhead flexible-budget variance = \$11,000 - \$10,000

Fixed overhead flexible-budget variance = \$1,000 unfavorable variance

A fixed overhead flexible budget variance is also called a *spending variance*.

The variance is unfavorable because your actual spending (\$11,000) was more than the static budget (\$10,000). If you're dealing with a spending variance, a positive number is an unfavorable variance. You spent more than planned. See Chapter 7 for more on variances.

Using production volume variances

An efficiency variance means that you used either more or less of the input (material, labor) than you planned. The variance reflects how efficiently you used your inputs to create a product or service.

For fixed overhead, there isn't an efficiency variance. The fixed cost is what it is. You incur the same amount of fixed costs regardless of how efficiently you produce your goods. If your actual production is higher or lower than planned, it doesn't change your flexible budget total for fixed overhead variance.

Whatcha gonna do? Instead of efficiency variance, fixed overhead variance uses something called a *production-volume variance*. Because fixed costs are fixed, the production volume variance measures how much output you got for the fixed costs you put in. The focus is on the output, not the amount of costs you put in (the input). This variance reveals how efficient you were at producing goods using a fixed level of budgeted costs.

This variance compares budgeted fixed overhead and allocated fixed overhead, based on actual output. (That's a mouthful.) Here's another way of saying it: You take the budgeted fixed overhead and apply it to actual output.



For fixed overhead analysis only, budgeted fixed overhead, flexible budget, and static budget all mean the same thing. This is because fixed costs don't change as the level of volume changes. That relationship is true when you operate within the relevant range.

Assume actual tire production for April is 3,500. Table 8-1 shows budgeted fixed overhead applied to actual output.

Table 8-1 Budgeted Fixed Overhead — Applied to Actual Output

Budgeted cost allocation rate (A)	\$6 per unit
Budgeted machine hours per tire (B)	0.5 (30 minutes)
Actual tires produced (C)	5,000
Budgeted overhead applied (A × B × C)	\$15,000

Production volume variance = budgeted fixed overhead - budgeted fixed overhead applied

Production volume variance = \$10,000 - \$15,000

Production volume variance = (\$5,000) favorable variance

The negative variance is favorable because this is a *cost* variance. Spending less is what you want to do.

What this variance tells you is that even though you planned to spend only \$10,000 in fixed costs, you were able to produce more tires for the same budgeted amount of money. In theory, producing 5,000 tires should have cost you \$15,000 in budgeted fixed costs. However, you made them within the \$10,000 budget. This saved you \$5,000, because you were more efficient at producing your goods than you planned.

What you saw for fixed overhead analysis were two variances: the flexible budget variance and the production volume variance.

Assessing potential causes of fixed overhead variances

Fixed overhead variances determine if you measured the amount of required fixed costs accurately. You probably didn't, or you wouldn't have a variance. During the budgeting process, you made a judgment on the amount. Either you judged wrong, or something changed.

When you find an unfavorable cost variance, it means that you've spent more than you planned or that you were less efficient than you had hoped. Your estimate of fixed overhead costs was too low. A favorable cost variance means that you spent less or were more efficient than planned; your estimate of fixed overhead costs was too high. You completed production while spending less than you expected.

Those Vexing Variable Manufacturing Costs

Now shift your thinking from fixed costs to variable costs. *Variable manufacturing costs* (or *variable overhead*) increase as your activity levels (that is, production) increase. You may find variable manufacturing costs easier to visualize than fixed costs. Examples of variable manufacturing costs are

- ✓ Utility costs may vary with individual machines, how many machines are in use, and how long they run. Some costs are strictly proportional. Costs vary according to power consumption and amount of use.
- ✓ Repair and maintenance costs may vary according to the amount of time a machine uses. More use suggests more frequent maintenance.
- ✓ Design-engineer labor, sometimes referred to as *expert costs*, can vary from product to product, depending on the level of effort required to develop the products.

When you analyze variable manufacturing costs, chances are good that you find ways to reduce costs and increase your profit.

Working with variable overhead costs

You plan variable overhead costs using a process similar to planning fixed overhead. Your goal is to plan overhead costs, compare your plan (budgeted) amounts to actual spending (real life), and review any variances. When you understand the variances, you may be able to make changes to reduce costs.

Considering variable overhead in planning

Think (try always to think, think, think) about variable overhead costs in the planning stage before you start writing checks. The idea is to avoid a knee-jerk decision that may result in false allocation of costs, causing you to spend more than necessary. You saw this in the fixed overhead section of the chapter: Any time you fail to plan or schedule, you may end up reacting to a situation when you should have implemented a plan. You run the risk of overspending; then you have to work twice as hard just to put out the fire. Trust me: Poor allocation of overhead costs gives you gray hairs, and constant hassles shorten your life span.



There's good news with variable overhead: It's easier to spot and fix variable overhead overspending than fixed overhead overspending. By definition, variable overhead changes (being variable) with the level of activity, so if you think you're overspending on variable overhead, you may be able to slow — or stop — the production process and investigate.

You're less concerned with your required capacity when you plan variable overhead. You can start and stop production, which means that you can start and stop variable overhead spending. If for some reason you need to increase production by 10,000 units, you can add variable overhead as needed.

Figuring budgeted costs and activity levels

Say you manage a business that produces tires for cars. You need to compute a cost allocation rate for your tire production. This rate explains how much variable overhead you've budgeted, based on some measurement of activity (see the "Computing a cost allocation rate" section, earlier in this chapter). In planning, you determine that the cost pool for variable manufacturing overhead is repair and maintenance costs for the machinery. The annual budgeted cost is \$36,000. Your cost allocation base is machine hours, the same basis as for fixed overhead. The total budgeted machine hours are 20,000.

Compute a cost allocation rate:

$$\text{Budgeted cost allocation rate} = \text{cost} \div \text{machine hours}$$

$$\text{Budgeted cost allocation rate} = \$36,000 \div 20,000$$

$$\text{Budgeted cost allocation rate} = \$1.80 \text{ per machine hour}$$

The \$1.80 per machine hour is also the *flexible budget variable manufacturing overhead per machine hour*. This says that you are planning to spend \$1.80 on repair and maintenance for every hour the machine runs. A flexible budget applies actual production to budgeted costs and activity levels.



Keep in mind that the allocation base for fixed and variable overhead isn't always the same. In this case, using machine hours for both types of overhead makes sense. That activity is driving both fixed overhead (utility cost, for example) and the variable overhead (repair and maintenance costs). The more the machines run, the more utility and maintenance costs you are likely to have.

Say the actual tire output for the period was 5,000 units (tires). You can now compute *flexible budget machine hours per output*. This is a new term that was not used for fixed overhead.

$$\text{Flexible budget machine hours per output} = \text{machine hours} \div \text{units (output)}$$

$$\text{Flexible budget machine hours per output} = 20,000 \text{ hours} \div 5,000 \text{ units}$$

$$\text{Flexible budget machine hours per output} = 4 \text{ hours}$$

Each tire (unit) produced requires 4 hours of machine time. You use budgeted machine hours (from the cost allocation rate) and actual units produced.

Now pause for just a minute and consider the two previous formulas:

- ✓ Budgeted cost allocation rate: Total cost divided by total machine hours
- ✓ Flexible budget machine hours per output: Total machine hours divided by units produced

A cost allocation rate is always a total cost divided by some level of activity. In this case, it's machine hours. Machine hours per output is calculated as a level of activity (machine hours) divided by units produced. Read the bullet points and this paragraph a second time, if you need to. It's a difficult concept but an important one.

Adding in actual costs and activity levels

You need data from actual costs and activity levels to perform your variance analysis. Your actual variable overhead costs totaled \$38,000. You used 18,000 hours of actual machine time.

Actual machine hours per output explains how many machine hours you used per actual unit produced:

$$\text{Actual machine hours per output} = \text{actual machine hours} \div \text{actual units (output)}$$

$$\text{Actual machine hours per output} = 18,000 \div 5,000$$

$$\text{Actual machine hours per output} = 3.6 \text{ hours}$$

In the “Figuring budgeted costs and activity levels” section, you note a flexible budget of 4 hours per unit. The actual hours, 3.6, are less than you planned. Using fewer hours will generate a favorable variance. You used less than you budgeted.

You can calculate the cost for each machine hour by applying *actual variable manufacturing overhead per machine hour*:

Actual variable manufacturing overhead per machine hour = budgeted cost ÷ budgeted machine hours

Actual variable manufacturing overhead per machine hour =
\$38,000 ÷ 18,000

Actual variable manufacturing overhead per machine hour = \$2.11 per machine hour

Implementing variance analysis

This section dives into variance analysis as it relates to variable overhead. I cover spending and efficiency variances, the two components of a variable overhead variance. A spending variance occurs when the rate or price you pay different from your budget. An efficiency variance is incurred when you use more or less than you plan.

You implement variance analysis to understand differences between planned and actual costs. You hope to learn from the analysis and reduce your costs moving forward.

Comparing the use of the term flexible budget variance

Flexible budget variance is used in the fixed overhead costs section earlier this chapter. However, flexible budget variance has a different meaning for variable overhead.

Refer to the section “Calculating flexible budget variances,” earlier in the chapter. That’s where you see that for *fixed overhead*, the spending variance is also the flexible budget variance. For *variable overhead*, the flexible budget variance is the sum of two variances.

Here’s a variance formula for variable overhead:

Flexible budget variance (also variable overhead variance) = spending variance + efficiency variance

To keep this straight in your head, flexible budget variance refers to *one* variance for fixed overhead. Flexible budget variance is the *sum of two* variances for variable overhead.

Computing spending variance and efficiency variance

Spending and efficiency variances relate to other concepts you see in this book. In Chapter 7, you see the formula for price variance:

$$\text{Price variance} = (\text{actual price} - \text{budgeted price}) \times (\text{actual units sold})$$

The price variance formula is similar to the *variable overhead spending variance*. You already calculated both an actual and a budgeted cost in earlier sections of this chapter. You also see (in an example) the actual production in units (tires). Instead of actual units sold, this variance uses actual units *produced*. That's because you're applying overhead to production. You use actual and budgeted costs instead of prices. All that being said, here's the formula:

$$\text{Variable overhead spending variance} = (\$2.11 - \$1.80) \times (18,000)$$

$$\text{Variable overhead spending variance} = \$5,580$$

It's an unfavorable variance, because you spent more than you planned. Once again, if you get a positive number for a cost variance, it's unfavorable.

Now consider the variable overhead *efficiency* variance. If you have an efficiency variance, you used more or less than you planned. You need two calculations for this variance; then you compute the difference between the two amounts.

Here's the first calculation:

$$\text{Actual quantity} \times \text{budgeted price} = 18,000 \text{ units} \times \$1.80$$

$$\text{Actual quantity} \times \text{budgeted price} = \$32,400$$

The second calculation is *budgeted variable overhead applied to actual output*. Way back in Table 8-1, there's similar calculation for fixed overhead, Table 8-2 displays a related calculation.

Table 8-2 **Budgeted Variable Overhead —
Applied to Actual Output**

Flexible-budget machine hours per output (A)	4
Actual output (units) (B)	5,000
Flexible-budget overhead per machine hour (C)	\$1.80
Budgeted variable overhead applied (A × B × C)	\$36,000

$$\text{Variable overhead efficiency variance} = \$32,400 - \$36,000$$

$$\text{Variable overhead efficiency variance} = (\$3,600).$$

Because this is a negative cost variance, it's favorable. Now, you had a hint that this variance might be favorable earlier in the chapter. Roll back to the "Adding in actual costs and activity levels" section. You see that the actual machine hours per unit is a rate of 3.6. That rate is less than the budgeted amount of 4 hours. So, it makes sense that the efficiency variance would be favorable. You used less than you budgeted.

The variable overhead variance is the sum of the spending variance and the efficiency variance. Here's your variance calculation:

$$\text{Variable overhead variance} = \$5,580 + (\$3,600)$$

$$\text{Variable overhead variance} = \$1,980$$

Because the positive cost variance is unfavorable, that means your costs for variable overhead were more than planned.



One point bears repeating: You have a variance because you spent more or less than planned (the price or rate you paid had a variance), or you used more or less than planned. You can apply that thought to just about any variance in cost accounting.

Finding the reasons for a variable overhead variance

You want to know why variances occur so you can make changes to your business. Those changes (have you heard me say this before?) can lower your costs and improve your profit.

The spending variance was the difference in per unit cost (actual versus budgeted), multiplied by actual units produced. So you should consider why actual variable overhead costs would differ from your flexible budgeted cost.

There's one factor to put out there right up front: The variance can't be due to a difference in units produced. Both the budgeted and actual calculations used 5,000 (actual) units produced. Think about the check you wrote for variable overhead. In this case, your budgeted variable overhead was \$36,000, but your actual cost was \$2,000 higher (\$38,000):

$$\text{Variable overhead spending variance} = (\$2.11 - \$1.80) \times (18,000)$$

$$\text{Variable overhead spending variance} = \$5,580$$

You should also consider machine hours. Actual machine hours used were less than budgeted (18,000 versus 20,000). That means the higher actual cost was spread over fewer units ($\$38,000 \div 18,000$ units). As a result, the actual overhead per machine hour was higher than budgeted (\$2.11 versus \$1.80). You have an unfavorable spending variance, because the \$2.11 actual rate per machine hour is higher than the \$1.80 budgeted.

You can consider several reasons for the difference. You had to pay a higher total amount than planned (\$38,000). Maybe the hourly rate for machinery repair was higher than budgeted.

Finally, the favorable efficiency variance is due to using 2,000 fewer machine hours than you planned (18,000 versus 20,000). Think about it. You used fewer hours than budgeted, so you spent less than budgeted. Variable costs change as total machine hours change.

Chapter 9

What's on the Shelf? Inventory Costing

In This Chapter

- ▶ Determining what costs are included in inventory
 - ▶ Understanding the methods for recognizing cost of sales
 - ▶ Comparing variable and absorption costing
 - ▶ Deciding on a method to determine production capacity
 - ▶ Reviewing common problems in inventory accounting
-

If you're starting a retail business, one of your largest investments is inventory. Say you start a gift shop. To attract customers and meet their needs, you need to stock the products they want; you need to spend money to fill your shelves. Decisions you make on accounting for inventory have a huge impact on pricing your products and ultimately on your profit.

This chapter presents the types of costs that are inventory-related. The idea is to assign a dollar amount as the total cost for each product. That sounds obvious (of course every item has a cost), but there are different methods for assigning costs. Your inventory value decision affects your cost of sales, and that (of course) affects other things, like your operating profit.

This chapter also looks at capacity. For this book, *capacity* is the maximum amount of production and sales that you can generate, using all of the assets you currently have. Those assets include equipment, factory space, your staff, and your salespeople. Consider how much business (in terms of sales and production) you can realistically handle. As a businessperson, you should consider activity levels that are reachable, not just “pie in the sky.”

Working with Inventoriable Costs

Inventoriable costs are all of the costs of your inventory item and are not immediately expensed. They first become assets — inventory. In a nutshell, inventoriable costs should include all costs to prepare the goods for sale. You need to know which costs are attached to inventory so you can price your product based on the total product costs. If you know your total cost, you can better compute a sale price that includes a reasonable profit. Later in this chapter, you see that inventoriable costs can remain with the inventory item for months.

Using the matching principle to calculate profit on sale

Profit is defined as revenue less expenses. To measure profit accurately, you need to match revenue with related expense. When you sell an item (create revenue) you need to account for or match the expenses you incurred for that sale. Applying this *matching principle* allows you to calculate an accurate profit on your sale.

Some textbooks talk about the matching principle, and by that they mean that there's a cause-and-effect relationship. If you write a check for inventory, you should include that amount as an inventory cost (of course), but there are other costs, too that you should include in inventory. Hard to say, but easy to demonstrate.

Checking out inventoriable costs

Say you own a gift shop and sell greeting cards. You write checks for greeting cards, which you enter into inventory. You also pay shipping costs and an insurance premium to insure against damage during shipment. All of these costs are part of your inventory (greeting cards) and should be included in the inventory cost.

Inventory is an asset account. Asset accounts are defined as having a future benefit. With inventory, the future benefit is that you can sell the inventory item and generate revenue.

As already mentioned (but worth stating again), inventoriable costs should include all costs to prepare the goods for sale. You couldn't put goods on your shelf without paying shipping and insurance costs. Those costs, in addition to the product cost, moved the inventory from your supplier to your gift shop's shelves.

Each greeting card in the gift shop should include a portion of all three costs — merchandise, shipping, and insurance. That way, the revenue from the greeting cards sales is matched with the related expenses. The inventory cost process is discussed later in this chapter.



FOB stands for *free on board*. It goes back to the days when goods shipped “on board” a vessel. *FOB* specifies which party (buyer or seller) *pays* for shipping and loading costs. It also describes who has title (ownership) to the goods during shipping — and, therefore, who bears the *risk of loss* due to damage or destruction. If the truck blows up on the freeway, either you or the seller bear the risk. If you are the buyer, specify “*FOB destination*” in your purchase orders. Say a seller’s in Chicago, and your store is in St. Louis. Most likely, you’ll pay shipping, and the order will say “*FOB destination*” or “*FOB St. Louis.*” This means that you are not liable for damage to the goods until you receive them — which is what you prefer.

Working with non-inventoriable costs

By contrast, utility cost (such as the cost of heating and cooling, your water bill, sewer bill, and so on) isn’t an inventoriable cost because it isn’t a direct cost that you can trace to a product. While utility cost is certainly a business expense, it doesn’t directly relate to inventory.

It’s also difficult to allocate utility costs as an indirect cost. The activity (such as heating and cooling) doesn’t relate to inventory sales. (See Chapter 2 for direct and indirect cost info.) If you can’t trace or allocate the cost, you expense it as you incur it. A utility cost paid in May is expensed in May. Recording the expense immediately reflects the *principle of conservatism*. More on this principle in the next section.

When it comes to the matching principle, your utility bill is handled differently. You just saw that utility costs are expensed as they are incurred. To calculate profit, your May sales are matched with the utility costs for May. Here’s a summary:

- ✓ Inventoriable costs are traced to the inventory item. The costs are expensed when the item is sold. So the revenue from the sale is matched with the cost of the sale.
- ✓ Non-inventoriable costs (like utility costs) are expensed each month as they are incurred. The costs are not traced to the inventory item. The expense is matched with the revenue for the month.

Erring on the conservative side

Because inventory is often your biggest asset account, the decisions you make about inventory are critical. When you make decisions, you should keep in mind the principle of conservatism. Applying this principle helps you generate financial statements that are not overly optimistic. The principle of conservatism helps the statement reader understand the true condition of your business.



Accountants stick to several principles. One of them is the principle of conservatism. Many actions an accountant takes involve judgment. Conservatism directs you to err on the conservative side of a decision. Consider which decision would make your financial statements look less attractive:

- ✓ If you're making decision about expenses, recognize the expense sooner than later. As a result, your profit will be lower. If you have to make a judgment, err on the side that shows less profit.
- ✓ If you have to make a judgment call about revenue, delay posting the revenue until you know you've earned it. Less revenue means less profit.

That's the big picture of conservatism at this point.

Costing Methods for Inventory

You buy inventory over time, not all at once (except, of course, when you first stock a store). How much you buy depends on customer demand and the amount of inventory you already own. Over time, the price you pay for inventory changes, both up and down. You need to select a method that best recognizes the cost of your inventory.

There are four methods: *first-in, first-out*; *last-in, first-out*; *weighted average*; and *specific identification*. After you understand and apply a method, you can attach an accurate cost to each inventory item. After you select a method, you need to stick with it, which is called the *principle of consistency*.



When you apply a consistent inventory cost method, your financials will be consistent. Someone reading your financial statements will see an apples-to-apples comparison of inventory costs. If you change from one method to another, you risk distorting your financial statements. At the least, you have to explain the change of method in the financials; it's only fair to those reading the information, such as investors.

For this analysis, you should assume that prices increase over time. That's normally what happens in real life. *Inflation* is defined as the overall increase in retail prices over time. *Overall* means the prices of a representative list of goods that people buy all the time, such as food, energy, medical services, and so forth. Those basic items are used to measure inflation. You can see a typical Consumer Price Index at the U.S. Bureau of Labor Statistics website, <http://www.bls.gov/news.release/cpi.nr0.htm>.

The effect of prices increasing over time is that your older inventory costs less than your more recent purchases. You use this assumption for all three inventory methods.

Say you own a hardware store. Table 9-1 displays purchase and sale dates, number of units, and prices for a rubber mallet.

<i>Date</i>	<i>Units Purchased</i>	<i>Price Per Unit</i>	<i>Total</i>
10/1	100	\$10	\$1,000
10/15	150	\$12	\$1,800
10/17	75	\$15	\$1,125
Total Units	325	Total Cost	\$3,925
<i>Date</i>	<i>Units Sold</i>		
10/25	50		
10/31	50		



You need the info in Table 9-1 for all three inventory methods.

Here are a few keys things to remember for inventory costing:

- ✓ The number of units purchased and sold is the same for all methods.
- ✓ The units don't change. Only the cost placed on the units changes.
- ✓ The goods put on the shelf and then sold are the same in all cases.

There's a total cost at the lower-right corner of Table 9-1 (\$3,925). That total cost ends up in one of two places. You either sell the inventory (cost of sales), or it stays on the shelf (ending inventory).

The cost of sales and ending inventory adds up to \$3,925. This is true, regardless of which inventory method you choose. If you remember to account for all the units — and all the dollars — you correctly account for inventory.

Using the first-in, first-out (FIFO) method

The *first-in, first-out (FIFO)* method assumes that you sell the oldest items first. You can safely assume that inventory prices increase over time. In Table 9-1, the unit prices increase during the month (from \$10 to \$12 and then to \$15). That means your older inventory items are less expensive.

At the grocery store, the stockers usually put the oldest milk (the milk that's closest to expiration) at the front of the cold case. The new milk is in the back. The store wants you to buy the oldest milk before it expires. You don't have to go that far with your inventory, but that's how you should think about FIFO. It's *as if* the oldest items are sold first. If prices increase over time, the oldest items will also be the least expensive.

Your goal is to account for your inventory cost accurately, so you know your total costs. Table 9-2 shows your cost of sales for the FIFO method.

<i>Date</i>	<i>Units Sold</i>	<i>Price Per Unit</i>	<i>Total</i>
10/25	50	\$10	\$500
10/31	50	\$10	\$500
Total Units	100	Total Cost	\$1,000

Here's how your units moved using the FIFO method:

Units in ending inventory = total units – units sold

Units in ending inventory = 325 – 100

Units in ending inventory = 225

This calculation shows the movement of dollars:

Ending inventory = dollars to account for – dollars for units sold

Ending inventory = \$3,925 – \$1,000

Ending inventory = \$2,925

With these calculations, you account for all the units and cost in Table 9-1.



Notice that the top of Table 9-1 starts with the oldest purchases (10/1). As you move down, you move later into the month. This layout helps you choose the correct units for figuring the cost of sales.

For FIFO, you sell the oldest units first. Start at the top of Table 9-2 and work your way down. On 10/25, you sold 50 units. You start with the oldest purchases. The units you sold on 10/25 were from the 10/1 purchases. You take 50 of those 100 units purchased on 10/1 and move them into cost of sales. On 10/31, you sold another 50 units. For FIFO, start looking at the top of the table. You use 50 of the remaining units purchased on 10/1 and move them to cost of sales.

Table 9-2 displays the two sales at the 10/1 \$10 purchase price. If you had sold any more units, you'd take units from the 10/15 purchase at \$12 per unit. That's because all 100 units of the 10/1 purchase have already been sold.

Accounting with the last-in, first-out (LIFO) method

The *last-in, first-out* method assumes that you sell the most recent inventory items first. Take another look at Table 9-1. Because prices increased during the month, the last items purchased are more expensive than the first items purchased.

For LIFO, you start at the bottom of Table 9-1 and work your way up. You sell the most recent purchases first. With LIFO, you sell the 75 units you bought on 10/17 at \$15 first. When you sell all 75 of the 10/17 units, you're "movin' on up." The next units are the units you bought on 10/15 at \$12.

Table 9-3 shows cost of sales using the LIFO method. The sales dates and number of units sold are the same as FIFO (Table 9-2).

<i>Date</i>	<i>Units Sold</i>	<i>Price Per Unit</i>	<i>Total</i>
10/25	75	\$15	\$1,125
10/31	25	\$12	\$300
Total Units	100	Total Cost	\$1,425

Start at the bottom of Table 9-1. On 10/25, you sell 50 units. These are units you bought for \$15 on 10/17. On 10/31, you sell another 50 units. For the remaining 50 units sold, you first sell the remaining 25 units at \$15 (the 10/17 purchases). Then you move up one spot in Table 9-1. You sell 25 of the units you bought for \$12 on 10/15. To fill the entire sale order of 100 units, you pulled units from two different purchase dates.



You're not selling the *actual* physical units from a particular purchase date. They all look the same in the stockroom or on the shelf. You're just using a costing method, *assuming* that the units sell *as though* they were from a particular purchase date.

The number of units sold (100) was the same whether you're using FIFO or LIFO. The inventory method you choose has no impact on the movement of units; however, your cost of sales is different. FIFO cost of sales was \$1,000 (Table 9-2). LIFO cost of sales totaled \$1,425 (Table 9-3). That's a big difference, but it's to be expected. Because LIFO sells the more recent (and more expensive) units first, you'd expect the LIFO cost of sales to be higher.

Here is the movement of dollars for LIFO. Note that you need to account for the same total dollar amount of inventory that you did with FIFO. That is, the sold and unsold items still total \$3,925:

Ending inventory = dollars to account for – dollars for units sold

Ending inventory = \$3,925 – \$1,425

Ending inventory = \$2,500

Because LIFO's cost of sales is higher, the ending inventory is lower (\$2,500 versus \$2,925). What's left on the shelf is less valuable.

Weighing the merits of weighted-average cost

The *weighted-average* method for inventory takes total inventory costs and divides it by total units. That cost per unit is assigned to every unit sold. This method simplifies your bookkeeping for inventory. Here's an example, using the same total cost and total units in Table 9-1:

Weighted-average cost per unit = inventory cost ÷ units

Weighted-average cost per unit = \$3,925 ÷ 325

Weighted-average cost per unit = \$12.08

FIFO and LIFO are difficult, because you're required to keep track of each purchase — the number of units and the cost. You also have to monitor each sale and the purchase price of the items you used to fill that sale. With either FIFO or LIFO, sometimes you have to fill orders by selling units from two (or more) purchases at two (or more) different prices. That's a lot to track!

Think of the benefit-cost ratio (BCR). There are cost versus benefit discussions throughout the book, and here's another one. You need to decide if the extra work of using the FIFO or LIFO method (cost) is worth it (benefit). The FIFO or LIFO method lets you see the impact of selling cheaper or more expensive goods first. The "impact" is the effect on profit.

If you decide that the extra information isn't worth it, you can simply use weighted-average cost per unit.

Considering specific identification method

The *specific identification* method puts a very fine point on your inventory cost. With specific identification, you select an inventory item sold. You use the exact cost of the item for cost of sales. You track inventory and cost of sales *by item*.

For example, if you're in the luxury or custom item business (expensive clothing, jewelry, cars, and so forth), you may want to track each individual item in inventory. If an item in inventory is expensive, you want to know where that item is at all times. By contrast, FIFO and LIFO account for purchases and sales by groups of items — lots.

Analyzing profit using FIFO and LIFO

The FIFO and LIFO methods use different ways to determine the cost of inventory sold. Cost of sales is different for each method (see Tables 9-2 and 9-3) and generate different levels of profit.

Table 9-4 uses the cost of sales from Tables 9-2 and 9-3. In each case, you sold 100 units. Assume you sold each unit for \$20. Here's the profit calculation for FIFO and LIFO.

	<i>FIFO</i>	<i>LIFO</i>
Sales revenue (\$20/unit)	\$2,000	\$2,000
Cost of sales	\$1,000	\$1,425
Profit	\$1,000	\$575

FIFO generates a higher profit because it sells the older, less expensive units first. Your cost of sales for FIFO is lower. So after 100 units sold, you show a bigger profit using the FIFO method.

You've heard several times by now that the total units and total cost are the same with any inventory method. To explain it, Table 9-5 assumes that you sell the entire ending inventory (check out Table 9-1). Here's your ending inventory in units:

Ending inventory in units = units purchased – units sold

Ending inventory in units = 325 – 100

Ending inventory in units = 225

Assume that the remaining 225 units then sell at the same \$20 each. Your revenue is 225 units × \$20 per unit, yielding \$4,500. Table 9-5 shows the profit earned by selling the ending inventory. In other words, the ending inventory moved to cost of sales.

Table 9-5 Profit on 225 Units Sold — FIFO and LIFO		
	<i>FIFO</i>	<i>LIFO</i>
Sales revenue (\$20/unit)	\$4,500	\$4,500
Cost of sales	\$2,925	\$2,500
Profit	\$1,575	\$2,000

The LIFO method sells the newer, more expensive goods first. The LIFO ending inventory is made up of less expensive goods. So it's not surprising that the cost of sales (ending inventory) for LIFO is less than FIFO (\$2,500 versus \$2,925).

It all comes out the same in the end (see Table 9-6).

Table 9-6 Total Profit- FIFO and LIFO		
	<i>FIFO</i>	<i>LIFO</i>
First 100 units	\$1,000	\$575
Next 225 units	\$1,575	\$2,000
Total profit	\$2,575	\$2,575

Because you purchased 325 units overall and sold them all for the same price (\$20 per unit), the total profit is the same. Sure, FIFO generated more profit when you sold the first 100 units (see Table 9-4). But that evened out when you sold the rest of the inventory. Over time, you end up with the same total profit.

FIFO and LIFO inventory methods create the same level of profit and cost of sales. The only difference is the timing of recognizing profit and cost levels. Table 9-6 proves that point. For any group of items purchased, there is no difference in profit and costs once all of the units are sold. That assumes that the same selling price is used for each costing method.

In fact, the same is true of weighted-average costs. That calculation generates the same total profit as FIFO and LIFO.

What's important is to select an inventory method and stick with it. This is the principle of consistency. (See the "Costing Methods for Inventory" section, earlier in this chapter.) If you stick with the same method, the financial statement reader can see how profits and cost of sales are generated.

So why the different methods? Different industries use different inventory methods. It's critical that you understand the financial impact of using one method or another. FIFO method means you will recognize profit sooner; LIFO recognizes more profit in later periods.

To judge the true profitability of a business, you need to understand when each inventory method recognizes profit.

Using Variable and Absorption Costing to Allocate Fixed Manufacturing Costs

You see a theme throughout this book: Determine how much you spend on an activity (a job, an hour of machine time, and so forth); then *trace* or *allocate* the cost to a product so you can calculate a sale price and a profit on its sale. Next, consider why you spent those dollars.

Variable costing and absorption costing both relate to how fixed manufacturing costs are dealt with on the income statement. Each method treats the fixed costs differently. *Variable costing* expenses the fixed manufacturing costs as incurred. *Absorption costing* attaches the fixed manufacturing costs to inventory. The cost isn't expensed until the inventory item is sold. At that point, the inventory becomes cost of sales.

The two methods reflect two different views of fixed manufacturing costs. The absorption costing view is that the costs are inventoriable. On the other hand, the variable costing view is that fixed manufacturing costs are incurred every month. The costs should not be attached to inventory.

The method you select to address fixed manufacturing costs has an impact on your inventory's value. If you choose absorption costing, your fixed manufacturing costs are attached to inventory. As a result, your inventory value is higher — and your immediate expenses is lower.

You'll delay recognizing the fixed manufacturing costs as an expense until the inventory is sold. The method you choose can have a large impact on your inventory value and your recognition of profit.

Defining period costs and product costs

According to Generally Accepted Accounting Principles (GAAP), a *period cost* is to be expensed immediately as it's incurred. A *product cost* “stays with” the product and first becomes inventory until the product is sold. Imagine that the cost is attached to your product or service. It's expensed when you sell the product to your customer. At that point, all of the product costs are expensed. GAAP requires this treatment of period and product costs on all external financial statements of public companies.

Variable costing, which is used only for internal financial statements (used to make decisions), considers fixed manufacturing costs as period costs. Under variable costing, these costs are expensed as incurred. Absorption costing (required by GAAP) treats fixed manufacturing cost as a product cost. Those costs are part of inventory and later become cost of goods sold. On the income statement, cost of sales and net income results are different, depending on which costing method you use.



If you have ending inventory, you have a difference in total costs and profit (net income). Recall that absorption costing “attaches” fixed manufacturing costs to inventory, so some of the cost is sitting on the shelf until you sell the item. Variable costing expenses that cost immediately. If you sell your entire inventory, no problem. All the expense has gone out the door under either method. It's all cost of sales, and both methods result in the same amount of income.

The problem comes in when you have ending inventory sitting on the shelf. If you use absorption costing, that inventory has fixed manufacturing costs attached. So that cost isn't expensed until you take the product off the shelf and sell it.

In the short term, you have less immediate expense with absorption costing. Less expense results in a higher profit. When your entire inventory is sold, your total costs and profit are the same, regardless of which method you choose.

Applying variable and absorption costing

Because variable and absorption costing generate different levels of cost and net income, you need to understand the differences so you can select a costing method to use internally for decision-making.

Say your business manufactures handsaws. Table 9-7 shows a summary of production, sales, and costs in Year 1

Production (units)	3,000
Sales (units)	2,500
Sales (at \$25 per unit)	\$62,500
Fixed manufacturing costs	\$21,000
All other product costs	\$33,000

Because you didn't sell all of your production, you created ending inventory:

$$\text{Ending inventory} = \text{units produced} - \text{units sold}$$

$$\text{Ending inventory} = 3,000 - 2,500$$

$$\text{Ending inventory} = 500$$

Your fixed manufacturing costs are \$7 per unit produced ($\$21,000 \div 3,000$ units). Absorption costing requires you to assign \$3,500 of fixed manufacturing costs to ending inventory ($\$7 \times 500$ units). Table 9-8 outlines the profit in Year 1, comparing variable and absorption costing.

	<i>Variable Costing</i>	<i>Absorption Costing</i>
Sales (at \$25 per unit)	\$62,500	\$62,500
Fixed manufacturing costs	\$21,000	\$17,500
All other costs	\$27,500	\$27,500
Total costs	\$48,500	\$45,000
Profit	\$14,000	\$17,500

Absorption costing deferred \$3,500 of fixed manufacturing costs. The fixed manufacturing costs are only \$17,500. You see that absorption costing has a \$3,500 higher profit (\$17,500 versus \$14,000).

In Year 2, assume that your sales and sales price are the same. You also sell all your production, plus the 500 units that were in ending inventory. Your sales (2,500 units) are 500 units more than your production (2,000 units). Because you produced less in Year 2, the all-other-cost number declines to \$22,500. Less production means less cost. Check out Table 9-9.

Production (units)	2,000
Sales (units)	2,500
Sales (at \$25 per unit)	\$62,500
Fixed manufacturing costs	\$21,000
All other costs	\$22,500

Variable and absorption costing are the same if you sell all of your production. You don't produce any ending inventory, so you don't defer any fixed manufacturing costs into inventory items. Table 9-10 displays the profit in Year 2.

	<i>Variable Costing</i>	<i>Absorption Costing</i>
Sales (at \$25 per unit)	\$62,500	\$62,500
Fixed manufacturing costs	\$21,000	\$24,500
All other costs	\$27,500	\$27,500
Total costs	\$48,500	\$52,000
Profit	\$14,000	\$10,500

Five hundred units from Year 1 ending inventory are sold in Year 2. In Table 9-9, production of 2,000 is 500 units less than sales of 2,500. You had 500 units available for sale at the beginning of Year 2.

Fixed manufacturing costs for Year 2 are the same for both methods (\$21,000). However, absorption costing added the \$3,500 fixed manufacturing cost that was deferred in Year 1. The fixed manufacturing cost is \$24,500 (\$21,000 + \$3,500).

The variable costing profit in Year 2 is \$3,500 higher than the absorption costing profit (\$14,000 versus \$10,500). In Year 1, variable costing profit was \$3,500 lower than the absorption costing. When Year 1 ending inventory is sold in Year 2, absorption picks up the fixed manufacturing cost that was deferred.

Over two years, all the production is sold. The total profit over two years is the same for both costing methods.

So I'm sure you're wondering about which method to use. Your profit *eventually* is the same under either method. In the long run, there is no advantage to using one method over another.

You should select a method and stick with it. By doing so, you're applying the principle of consistency. For a financial statement reader to compare your results year by year, you need to use the same method. It's the old idea of an apples-to-apples comparison. This principle comes up throughout the book.

Relating Capacity Issues to Inventory

Capacity refers to how much you can do, based on the assets (equipment, machinery, vehicles, and so forth) you have. In business, determining your true capacity level is a balancing act. You want to avoid investing too much and then find that the capacity isn't needed. The money you invest in unused production capacity could be better spent elsewhere.

On the other hand, you want to invest enough to fill every possible customer order. Your realistic capacity is somewhere in the middle. You want the ability to fill orders without biting off more than you can chew.

This section discusses four types of capacity. The first two types focus on production: *theoretical capacity* and *practical capacity*. Consider how much you could produce if customer demand was unlimited. The second two types focus on customer demand. *Normal capacity utilization* and *master budget capacity utilization* are driven by customer orders. Select a capacity method that makes sense to you, and use that as a tool to plan production and spending.

Reviewing theoretical and practical capacity

Theoretical capacity assumes that nothing in your production ever goes wrong. Accountants describe this capacity as working at full efficiency all the time.

Consider what your pie-in-the-sky or perfect-world capacity would be. It's a world in which everything runs perfectly and no machines or equipment ever break down. It's utopia where no worker ever makes a mistake. That would be great, wouldn't it? That's theoretical capacity, and you can't reach it. It seems silly, but you need to see this level of capacity to understand the others.

Say you own a business that makes athletic running shorts and other clothing. At maximum capacity, you can make 200 pairs of shorts per shift. You run three 8-hour shifts per day, 365 days a year. Based on those numbers, here is your theoretical capacity:

$$\text{Theoretical capacity} = \text{shorts} \times \text{shifts} \times 365 \text{ days}$$

$$\text{Theoretical capacity} = 200 \times 3 \times 365 \text{ days}$$

$$\text{Theoretical capacity} = 219,000$$

Unfortunately, this level of capacity isn't attainable. You need to take into account the unavoidable. That gets you to practical capacity.

Practical capacity is the level of capacity that includes unavoidable operating interruptions. Another description is unavoidable losses of operating time. Consider maintenance on equipment, employee vacations, and holidays. You're willing to accept a good, rather than perfect, capacity level.

The people in your company can help you determine your practical capacity. Your production and engineering staff can answer questions about machine capacity and repair time. Your human resources staff can forecast employee availability, based on vacations and holidays.

You determine that 250 days is a more realistic number of production days, given unavoidable operating interruptions. Also, you decide that two shifts per day are realistic. Here's the practical capacity calculation:

$$\text{Practical capacity} = \text{shorts} \times \text{shifts} \times \text{days}$$

$$\text{Practical capacity} = 200 \times 2 \times 250$$

$$\text{Practical capacity} = 100,000$$

The practical capacity is 100,000 units (pairs of shorts) per year.

Using normal and master-budget capacity

Normal capacity utilization is the level of capacity needed to meet customer demand over several years. *Master-budget capacity utilization* is the expected level of capacity needed for your current budget. You use both measurements to control costs.

Add the term *utilization* to the discussion. In this case, utilization means the amount of capacity you need to meet customer demand. That level may be less than the capacity levels you just reviewed.

Any available production capacity beyond the customer demand level isn't needed. You don't have customers to buy the extra products produced.



Consider whether your business is seasonal. Certain seasons produce more demand for certain product; then, when the season's over, retailers clear out merchandise. This is the clearance-sale concept. My friends who are smart shoppers always buy at the end of a season. They buy winter coats in April and swim suits in September. Stores are cutting prices to clear inventory that is no longer in season.

A lot is riding on your understanding this issue. You need to crank up production before your busy time of year. That means you need machinery, materials, and labor to be available during that heavy production time. Consider your cash position. You produce more goods, sell more goods, and collect more cash during your busy season. When things slow down, you produce less, and you need to plan your cash use to get through the slow times.

A two- or three-year period includes the impact of the seasonality of your business each year. If you sell outdoor athletic equipment, you have a busy spring and summer, and maybe a slowdown in winter. If you manufacture outdoor athletic equipment, you have a busy autumn and winter making products for retailers. An analysis over several years may pick up changes in the overall economy. Think about normal capacity as on-average capacity.

A *cyclical stock* is a term used in the investment business. This type of investment is affected by changes in the overall economy. Cyclical stock prices do well in good times and poorly in bad times. Picture companies that make or sell goods that are discretionary purchases. When the economy goes down, consumers buy fewer luxury items. Sales of expensive clothing, jewelry, and cars generally decline.

Master-budget capacity utilization is the expected level of capacity needed for your current budget. (Check out Chapter 7 for more on master budgets.) In planning, you make assumptions about costs and sales, and then you use the data to come up with a capacity level of production.

A word of caution: This year's budget may not reflect the same level of capacity needed over two to three years. Your master-budget capacity may reflect a great current economy and a high level of sales. Normal capacity might reflect an average economy over two to three years. The economy is like a roller coaster; there can be big highs and lows, and the changes can happen quickly. Keep your time period in mind as you make capacity decisions.

Choosing a capacity level

Your capacity-level decisions affect a product's total cost, pricing decisions, and financial statements. The process for evaluating employee performance is also affected by capacity. Capacity decisions have a ripple effect through your business.

If your decisions result in excess capacity, you spend more than you need to. If your decisions result in too little on capacity, you won't be able to fill all customer orders.

Costing your product

The concept of cost allocation is everywhere in this book. Cost allocation may spread a fixed cost over a level of activity. Your capacity is a level of activity, and it might impact your cost allocation decisions. If your capacity level isn't realistic, your cost allocation will be incorrect and impact your product's cost.

The section "Reviewing theoretical and practical capacity" shows that theoretical capacity is unattainable. Assume you use machine hours to allocate a \$50,000 fixed manufacturing cost. Theoretical capacity calls for 5,000 machine hours. First, do a fixed manufacturing cost allocation:

Fixed manufacturing cost allocation (theoretical capacity) = fixed cost ÷ machine hours

Fixed manufacturing cost allocation (theoretical capacity) =
\$50,000 ÷ 5,000

Fixed manufacturing cost allocation (theoretical capacity) = \$10 per hour

Next, take into account downtime for machine repair, holidays, and vacation time for your machine operators. You determine a practical capacity for 4,500 hours. Here's your fixed manufacturing cost allocation for practical capacity:

Fixed manufacturing cost allocation (practical capacity) = fixed cost ÷ machine hours

Fixed manufacturing cost allocation (practical capacity) = \$50,000 ÷ 4,500

Fixed manufacturing cost allocation (practical capacity) = \$11.11 per hour

Theoretical capacity's cost allocation is lower than practical capacity (\$10 versus \$11.11). Using theoretical capacity allocates too little fixed manufacturing cost to the product because the theoretical capacity was based upon perfect-world machine usage of 5,000 hours. You determine that 4,500 machine hours is more realistic.

Pricing decisions and capacity

The *downward demand spiral* is a bad thing. Say your company isn't willing to meet lower prices offered by competitors. By not lowering prices, you lose business. As you lose business, you have to spread the same costs over fewer products. Your per-unit cost increases. To maintain a profit, you raise prices. As prices increase, you lose more business. The more business you lose, the higher you must raise prices, which makes the situation worse.

You may have seen this type of scenario in a movie. A character makes a bad decision, and to fix things, the character makes even worse decisions, digging himself into an even deeper hole.

Okay, that sounds scary. So here's how you can prevent it from happening to you. When you're asked to meet a competitor's price, take a long, hard look at your cost assumptions.

Look at your capacity level. The downward-demand spiral is based on an *increasing decline* (how do you like that phrase?) in demand. To avoid the problem, use the practical capacity level.

Practical capacity is a capacity level based on production you can supply. If you use a capacity level based on *demand*, and it's too high, you have a problem. You're allocating a fixed cost based on too much capacity. As demand falls, the fixed costs are allocated to fewer units.

Now you're stuck in a downward demand spiral. As demand falls, the fixed costs allocated to each unit increases. The higher fixed cost forces you to raise your prices to maintain a profit.



If you make a small quantity of a costly product, it's easier to take that long, hard look at cost assumptions. If, for example, you own a rapid-prototype machine shop, you're probably dealing with one client who has a very special need. And you may be able to offer a well-thought-out lower price.



If you produce 100,000 pairs of running shorts per year, you're in a very competitive industry, and you may already have squeezed out costs from the product. Not to name names, of course, but the world's largest retailer demands cuts in price from vendors year after year. Those demands can run your business into the ground.

Capacity levels and employee evaluation

Assume you're a manager getting your annual review. You're accountable for cost variances in your department. If actual costs are more than budgeted (an unfavorable variance), it may count against you. Your boss considers the unfavorable variance to be a sign of weak cost control.

The trouble is, this scenario isn't an apples-to-apples comparison. The capacity cost was forecasted over several years; your review is for one year. To be fair, your company should use an annual capacity cost measurement. The master-budget capacity utilization is for one year. The company should use that one.

Focusing on uncertainty

In business, as in life, no amount of planning can remove all uncertainty. (I like the phrase “embrace the unknown” to feel better about it, but uncertainty is still unnerving.) Any capacity level you choose may result in unused capacity. Your estimate of production may be too high; your forecast of demand may also be too high. The good news is that you can analyze and correct.

However, unused capacity may not be all bad. That extra capacity can help you meet a sudden or unexpected demand for a product. Extra business is a nice surprise — *if* you're able to fill the orders. Although the unused capacity has a cost, it may pay off over time.