
Accounting Principles

Graduate business students will virtually always begin their programs of study with an introduction to accounting principles. The reason for this is simple: Accounting provides quantitative information that enables managers to make informed business decisions. Without a basic understanding of financial statements, accounting methods, and accounting measurement issues, much of the data analysis and interpretation required of business problems would not be possible. Accounting is often called “the language of business,” and for good reason. It provides a structural framework and a quantitative vocabulary with which most business issues and their solutions may be expressed. Managers, investors, and countless others would find themselves virtually paralyzed without the information provided by the accounting process. With such information the foundation can be built for understanding most business issues.

The significant demand for relevant, reliable, and timely financial information by capital markets, managers, regulators, and others makes the understanding of the accounting process of critical importance to business. Accounting today is a highly developed field, complete with codified rules, regulatory bodies, and professional certifications that signify degrees of individual expertise. At its core, however, understanding the subject starts with understanding the end objectives of the output it generates: the financial statements. It continues with appreciating the myriad of measurement bases that can exist across accounts included on these statements. Only then can it conclude with the various forms of analysis and decision making that render knowledge of the subject so powerful.

With this in mind, this chapter has five overarching objectives. First, it provides an introduction to the framework of financial accounting. An emphasis on the balance sheet equation is taken, as from this equation the key relationships across the financial statements reported by most companies can be emphasized. Second, the chapter explores the notion of accrual accounting, particularly how the methods, estimates, and assumptions made in the preparation of the financial statements affect interpretation. Third, it offers a step-by-step guide to reading the annual report, the most commonly used document from the accounting process. Fourth, it introduces a systematic approach to analyzing financial statements, including the basics of how to assess the financial health of a company. Finally, it deals with the field of managerial accounting, particularly how variance analysis of a project or business unit can yield valuable insights for the operating manager.

The Framework of Accounting: The Balance Sheet Equation

The foundation, or building block, of accounting rests with this fundamental concept: The resources available to a firm are bound by the claims made on those resources. This concept mirrors what should be economic intuition about the firm: Those providing capital investments to the firm (i.e., investors) have claims equivalent to the assets standing behind those investments. In this sense there must be balance—a balance that can be expressed as assets equal liabilities plus owners' equity.

Consider the basic power of this equation. Increases in a firm's assets must be financed by increases in liabilities (e.g., a bank loan) or in equity (e.g., a sale of stock), or by creating value through operations. Decreases in assets (such as a debt payment or a dividend payment) must be offset with decreases in that corresponding type of capital (e.g., liabilities or owners' equity, respectively). Changes (or Δ) in an element of the accounting system must likewise be balanced out:

$$\Delta \text{Assets} = \Delta \text{Liabilities} + \Delta \text{Owners' Equity}$$

To illustrate, consider what happens when the firm borrows capital from a bank. The cash received represents a new asset to the firm, but there is now a new claim against the firm that must be recorded as a liability. So assets increase by the amount borrowed (i.e., cash), and so do liabilities, and together these changes force a balance of the fundamental accounting equation. As another illustration, consider what happens on the other side of this transaction—that is, from the bank's perspective. The bank has given up cash, but has a new asset that would be labeled as a receivable. The reduction of one asset, cash, is exactly offset by the creation of another, a receivable.

From the balance sheet equation and these two examples, one can readily see that even the simplest transaction must have at least *two sides*, for a minimum of two accounting effects necessary to capture the nature of balancing. Perhaps you have heard of the term *double-entry accounting system*. The previous balancing equation is the basis for that system.

The financial statements are the primary output from the accounting process. How these statements relate to the balancing equation is also not that complex. Consider the context of your own personal financial scorecards. Three very basic questions one would ask about personal wealth would be the following: How much does one have? How much does one earn? How well does one manage one's money? The answer to the first question would come from a balance sheet, the answer to the second from an income statement, and the answer to the third from a statement of cash flows. In a sense, then, these three main statements, found in virtually every firm's financial reports, have as objectives tackling three very fundamental financial scorecard objectives. Here are some more specifics about what each financial statement attempts to capture:

- *Balance sheet.* This financial report presents a snapshot of the assets of the firm, and the claims upon those assets, at a particular point in time (i.e., the end of the fiscal year). The balance sheet is grounded in the balancing equation summarized earlier and attempts to provide detail regarding the firm's assets, liabilities, and owners' equity.
- *Income statement.* This financial report is a measure of the flows of business over a period of time expressed in terms of *profit and loss*. Profits are expressed in terms

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of total revenue activities of the firm, reduced by the costs incurred to generate those revenues. Some of these flows must be adjusted (or matched) across periods to correspond with other flows that are economically related. The activity captured in an income statement is reflected as certain *changes on the balance sheet*. Because net profit belongs to the owners of the firm, it is in the owners' equity section of the balance sheet that profit will be reported. The individual account capturing profit and loss is commonly referred to as *retained earnings*.

- *Statement of cash flows*. Because the income statement and the balance sheet result from accruals and allocations made by accountants, it can be difficult to tell what really happened to the firm in terms of the actual flows of cash. Did the firm generate more cash this year than last? The statement of cash flows helps answer this question. It recasts the performance of the firm into cash-based accounting and helps the reader understand the changes in cash and the causes. This statement is also often viewed as supplemental, as it merely specifies in detail how the *cash on the balance sheet* changes from period to period. It further segregates these changes as those relating to operations, to investing, and to financing activities.

Contained within each of these statements is a series of *accounts*, into which the transactions within the firm are recorded. Individual accounts therefore only provide additional detail about the fundamental accounting equation that is expressed in terms of assets, liabilities, and owners' equity, as described earlier. Remember this basic use of accounts as we review the financial statements for PepsiCo later in this chapter.

Accrual Accounting

The notion of reporting over distinct periods of time is an important feature of financial accounting. Because financial statement users desire to evaluate performance over time, the accounting process must be closed as of a specific date (quarter- or year-end), and adjustments to some accounts become necessary. Consider that for all practical purposes the accounting process follows predictable mechanical cycles each period. This process entails two distinct activities: the everyday recording of transactions during the period, and adjustments of certain key financial statement accounts after the period has ended. For the former, management sets accounting policies and procedures, and chooses accounting methods consistent with required standards—generally accepted accounting principles (GAAP)—that govern how each identifiable event will be recorded. There are choices here, such as whether to depreciate equipment uniformly or use accelerated depreciation, but the decision should be made with an eye toward accurately reflecting the underlying economics of the activity under measurement. For the latter, the accounting cycle is structured such that many estimates and judgments are adjustments made after a reporting period is complete. There are again choices here, such as how long the remaining life is on that same piece of equipment.

To appreciate the difference in these two activities, note first that the income statements and balance sheets you will see prepared for public U.S. companies are based on the accrual basis of accounting. Loosely speaking, the underlying tenet of accrual accounting is that assets and liabilities can build and shrink over time, with or without an actual exchange of cash. With these changing assets and liabilities come related changes in the net equity of the corporation (i.e., shareholder wealth). Consider a sale made on

customer credit with the payment by that customer expected to occur sometime next year. This first activity is a day-to-day transaction that would increase the earnings and asset base of the firm. If the customer's account is still outstanding at the end the quarter when the books must be closed, the second activity, an adjustment, may take place. Specifically, an adjustment for this account *may be necessary* for an estimated amount the manager believes will be uncollectible. For this credit sale event, also note that accrual accounting would dictate that there has been earnings this year, but none next. How? An asset, accounts receivable, will be recorded that reflects an increase in the net earnings of the firm (top-line revenue). Why this year and not next? Because it was this year that the fruits of the firm's effort have been realized. As long as it is reasonably certain that payment will be made, the customer's financing decision should have little to do with communicating to outsiders how well the firm did this year, and likewise what the existing asset base should be.

Most entities of any complexity use the accrual basis of accounting, which recognizes the financial effect of an activity when the activity takes place, without regard to the timing of its cash effects. For its part, the accrual accounting process depends on various allocation and matching decisions. Consider that measuring financial success would be simple if an entity had only to summarize and report its activities at the end of its life. Cash results and accrual results would be exactly the same. We would measure results by simply asking whether the owners of the company had more cash at the end than they had at the start. However, both management and outsiders demand information about an entity's performance during interim periods of its life. Accounting rules and conventions are designed to allocate (or assign) the financial effect of an entity's activities to specific periods of time. Accounting standards and conventions are also designed to comprehensively report all of a transaction's financial effects in the applicable period. The objective of this matching principle is to report revenues in the period in which they are earned and to report all expenses related to those revenues in the same period.

Accounting Discretion and Financial Statement Quality

The recording of most transactions in the accounting process is relatively straightforward and accurately reflect much of the day-to-day activities of the firm. Accrual accounting is designed to provide the most relevant and reliable values relating to assets owned and controlled, liabilities owed, and profits generated. Embedded in virtually every primary account on the financial statement is some amount of preparer discretion, a measurement decision that must be made by management within the bounds of GAAP. Stated differently, to communicate economic activities effectively, managers often must make certain judgments regarding accounting estimates, methods, and assumptions that become part of the measurement of an account. To restrict them in this respect would be to restrict the relevance of information communicated, but of course not to restrict them opens up the opportunity to communicate only in their self-interest. Consider the aforementioned sale on account. What if the average pool of customers tends to pay only 98 percent of the time? If this were truly the case, it would be more informative to record income earned in the year of sale at 98 percent, not the overstated 100 percent. There is clearly some element of judgment in this recording process, even if the company employs controls such as strict aging schedules. But it certainly would convey more valuable information to outsiders to communicate the expected round-trip substance of the sale that occurred that year.

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Sales and receivables are not the only accounts subject to reporting discretion. Recorded inventory (and future gross margins) will be dependent on chosen inventory accounting methods and estimates of realizable sales values. Fixed assets are subject to depreciation method choice, estimates of useful lives, and judgments about possible impairments in value. Liabilities recorded (or not) depend on assumptions regarding how likely it would be that amounts will be paid. Unrealized gains or losses on investments held are sometimes dependent on the trading intent in place at the financial reporting date. Deferred taxes may be reduced if there is some reasonable expectation that the tax benefits will never be realized.

So how does one make sense of accounting systems and controls that are abused by unscrupulous managers who manage earnings? How does the accounting system allow firms to keep liabilities off-balance sheet and/or build reserves? The answers lie with both motive and opportunity. Motive has been well chronicled by the financial press. Be it the ability of a manager to cash in on lucrative stock options that indirectly depend on reported earnings, a bonus tied to reported net income, a debt covenant that might be violated, or the mere act of self-preservation through job retention, there are ample motives for why one may choose the path of intentional violation of the accounting system.

Opportunity is a bit more difficult for some to understand. Often it is difficult to appreciate how and why an accounting system that has evolved over time, with significant amounts of time spent by accomplished business professionals evaluating the merits of every proposed accounting rule, can have so many perceived areas for abuse. But consider that the flaw some see in the accounting model is also viewed by most to be its main strength—the reporting discretion described earlier.

Two necessary features of the financial reporting process should mitigate these concerns that intentional fraudulent reporting is pervasive: (1) the required presence of internal controls and (2) the required external verification of financial reports via the independent audit. More specifically, the Sarbanes-Oxley Act of 2002 requires that the CEO and CFO certify, quarterly and annually, to the fairness and accuracy of all financial reports filed. The certifications must state that the reports were reviewed, that they do not omit material facts, that they do not contain untrue statements, and that they fairly present the financial position, earnings, and cash flows of the firm. Further, the CEO and CFO must provide assurance that the company has designed and has in place a system of controls, that any deficiencies in these controls have been disclosed to the board of directors, and that any significant changes to controls are disclosed. The criminal penalties associated with these certifications are quite stiff, with personal fines in the high seven figures and up to 20 years' imprisonment.

The essence of internal control is a system that a company has in place to ensure that actions within the organization are consistent with company financial reporting objectives. From an accounting perspective, these controls include formalized methods and procedures for authorizing transactions, complying with GAAP, and ensuring the accuracy of records. Proper accounting controls would help minimize unintentional errors and outright fraud.

Even with these controls in place, those not intimately familiar with the company who bear some risk of reliance on financial statement information will require some assurance of their validity. The Securities and Exchange Commission (SEC) requires that public companies each year file an audited fiscal year-end financial report. The auditor of the financial statements must be independent, and the accounting profession delineates certain minimum guidelines that must be followed: Procedures used must be designed

to detect illegal acts that would have a material effect on the financial statements, identify related-party transactions, and evaluate the company's ability to continue as a going concern. Furthermore, if an illegal act is suspected, including nonconformance with GAAP, the auditor is required to inform the appropriate level of management and assure that the audit committee of the issuer and/or the board of directors is adequately informed.

Even with required internal controls and independent external audits there have been notable breakdowns of the external auditing process. Over the past decade we have been witness to some of the largest corporate financial scandals in history, most of which had at their center financial statements that were grossly misleading by the very management entrusted with their care. WorldCom and Enron come first to mind. The accounting scandal at Enron, in particular, raised public awareness about the pitfalls of compromising auditor independence through relations with management and non-audit-related services. At the extreme, these cases are intentional accounting misstatement and outright fraud motivated by a desire to circumvent the integrity of the accounting process. Investors and other users should have confidence that the financial statements and related disclosures, when the accounting process is properly applied, strike the proper balance between providing information most relevant to decision making and information that is most reliably measured.

A Step-by-Step Guide to Reading Annual Reports

Reading financial statements is one of the best ways to gain an understanding of accounting and its significance to business. The annual report, however, is more than simply a means by which to provide accounting data. Companies often will use this document to communicate their organizational stories, both documenting the company's historical evolution and outlining future strategic plans. The following seven recommended steps illustrate one way to approach getting the most out of reading the typical annual report. The steps are illustrated using PepsiCo's 2008 Annual Report, which covers the entirety of the company's activities in fiscal year 2008, and its financial condition as of December 27, 2008.

Step 1: Pay Attention to the Themes in the Opening Letter to Shareholders

The letter to shareholders is usually the first item in the annual report and is valuable on many dimensions, but mainly for understanding at the start the *strategic intent* of the managers of the firm. The letter usually sums up performance during the past year, and expresses elements of the CEO's goals, values, and vision for the future. As an example, the letter in the 2008 Annual Report from Indra K. Nooyi, Chairman and CEO of PepsiCo, references the new strategic mission rolled out two years earlier, discusses how the company is delivering on objectives while navigating through the current recession, and highlights certain financial trends of importance to shareholders. The letter conveys a sense of practicality while emphasizing to shareholders that the company prevailed during tough times because "our teams of extraordinary people applied their can-do spirit and must-do sense of responsibility to meet the economic and market challenges head on." The letter closes as follows:

A great company is a place where people come together, with a purpose in common. By defining that purpose, by trying to bottle it, we are bound together. That is the message you see on every page of this report. It is full of stories and portraits that truly demonstrate

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the deeply personal, emotional connection our associates have made to Performance with Purpose. In any language, our associates will tell you, “We are Performance with Purpose.” Please join us on this trip around the globe, and see for yourself why I’m so inspired by the great things we’ve accomplished together—and so excited about the many opportunities that still lie ahead.

Through these words, a careful reader would get a hint of the issues to look for in the firm’s results for 2008, along with insights about directions to be taken during the next year. For instance, consider the following additional issues and insights gleaned from the letter:

- *Shareholder wealth and growth are key objectives.* The company has grown earnings per share and revenues and has increased dividends and share repurchases, and its stock has performed better than its peers’. A Productivity-for-Growth initiative was begun across all sections of the business.
- *PepsiCo has an international focus.* Significant new investments are highlighted in Brazil, India, Mexico, and China.
- *Sustainability is a corporate priority.* The company recognizes environmental and human capital responsibilities. The PepsiCo brand is a great asset, and with this comes a great responsibility.

In sum, critical thinking prompted by a close reading of the opening letter can lead to better analysis of a firm’s financial statements.

Step 2: Check the Auditor’s Letter

Investors in companies ordinarily require an annual audit of those companies’ financial statements. In fact, as described earlier for publicly traded companies, this is mandatory. The independent annual audit is one of the most basic protections intended to ensure compliance with GAAP. At the end of the financial report, one will find a letter from the firm’s independent auditors that explains what they did and what they concluded. Following the PepsiCo 2008 financial statements, the accounting firm KPMG Price Waterhouse wrote:

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of PepsiCo, Inc. as of December 27, 2008 and December 29, 2007, and the results of its operations and its cash flows for each of the fiscal years in the three-year period ended December 27, 2008, in conformity with U.S. generally accepted accounting principles. Also in our opinion, PepsiCo, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 27, 2008, based on criteria established in *Internal Control—Integrated Framework* issued by COSO.

This is a positive report, as most tend to be. Notably, the report does not just reference the accounting information reported, but also the firm’s internal controls designed to help prevent financial fraud from occurring. A negative opinion by an auditor might cite unfair or unacceptable presentation, nonconformance with GAAP, a material misstatement, or deficiencies in controls. In some cases, auditors must explain any material uncertainties affecting the financial statements—these uncertainties depend on the probability of loss due to uncertainty of such things as the “going concern” assumption¹ that underlies the preparation of most financial statements, uncertainty regarding the valuation or realization of assets, or uncertainty due to litigation. The astute reader of an annual

report will always check the audit report, because *anything but a positive report should, like a flashing red light, signal a major concern worth further investigation.*

Step 3: Review the Income Statement

The income statement is prepared using accrual accounting and summarizes the operating performance of the firm. It is organized on the principle that what customers buy (e.g., revenues), less what it cost to enable them to buy (e.g., expenses), results in profits. Recognizing this basic notion can help the reader sort out three concerns in looking at the income statement:

1. *The degree of profitability, and why.* Is the company making or losing money?
2. *The trend of profitability, and why.* Are profits increasing or declining over time? Are these due to changes in revenues, expenses, or both?
3. *The composition of profits.* Are the size and trend of profits due to ordinary operations, or to odd events that might distort the true profitability of the firm?

To illustrate, consider PepsiCo’s 2006 to 2008 income statements given in Exhibit 1.1. The company had over \$5 billion in profits during each year presented, but has experienced a modest decline, to \$5,142 during 2008 from \$5,658 million during 2007. Earnings per share similarly declined during this period. This trend by itself, all else equal, is not good news for investors. To what can we attribute this? The mathematical answer is simple: Revenues were up, but unfortunately costs went up at a faster rate. Observe that

Exhibit 1.1 PepsiCo Income Statements

**Consolidated Income Statement, PepsiCo, Inc. and Subsidiaries
 (in millions except per share amounts)**

<i>Fiscal years ended December 27, 2008, December 29, 2007, and December 30, 2006</i>	2008	2007	2006
Net Revenue	\$43,251	\$39,474	\$35,137
Cost of sales	20,351	18,038	15,762
Selling, general, and administrative expenses	15,901	14,208	12,711
Amortization of intangible assets	64	58	162
Operating Profit	6,935	7,170	6,502
Bottling equity income	374	560	553
Interest expense	(329)	(224)	(239)
Interest income	41	125	173
Income before Income Taxes	7,021	7,631	6,989
Provision for Income Taxes	1,879	1,973	1,347
Net Income	\$ 5,142	\$ 5,658	\$ 5,642
Net Income per Common Share			
Basic	3.26	3.48	3.42
Diluted	3.21	3.41	3.34

Source: 2008 PepsiCo, Inc. Annual Report.

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while top-line revenue grew at a healthy 9.6 percent, PepsiCo's two largest costs grew even faster. Cost of sales, which represents the costs directly associated with creating the vast array of products sold to the end consumer, rose by 12.8 percent. Selling, general, and administrative expenses rose by just under 12 percent. Together these relationships helped drive down PepsiCo's net income.

Step 4: Review the Balance Sheet

For most balance sheets, the major categories of assets are classified and ranked according to their liquidity, with cash, short-term investments, and other current assets (those that should be converted to cash within one year) at the top, and less liquid assets at the bottom.² For the remainder of the statement, current liabilities (those due within one year) are listed first. Next come debt and other liabilities, and toward the bottom is shareholders' equity, the residual claim on the firm. For a company such as PepsiCo, most components of the balance sheet are reported at the lower of *historical cost* or *market value*. Not all assets and liabilities of the firm are reported, only those that are *measurable, reasonably certain, and relatively easy to value*. Contingencies (potential assets or liabilities arising from past events such as a lawsuit) can be both difficult to measure and uncertain. The values of some patents, trademarks, and, in PepsiCo's case, its strong brand, are not based on identifiable past transactions and cannot be measured reliably. Thus many are not reported. In reading the balance sheet, one should aim to satisfy four questions:

1. *Is the firm solvent?* Solvency is the ability to pay liabilities as they come due. The back-of-the-envelope test of this is to first observe by how much the value of assets exceeds the value of liabilities.
2. *Are the firm's assets sufficiently liquid?* Liquidity measures the ability to meet near-term cash obligations—these might be liabilities that need to be repaid, or they might be a forthcoming payroll or the need to purchase raw materials in advance of a sudden surge in demand.
3. *What is the mix of assets?* The reader should look for unusual concentrations or categories of assets. Concentration of the firm's resources into a speculative venture would be a cause for concern. Concentration in cash might suggest undue risk aversion or the lack of investment opportunities with attractive return potential. Also, asset categories that seem to have no relevance to the firm's business purpose should raise a red flag.
4. *What is the mix of financing?* Most mature firms finance their businesses with *some* debt. The absence of debt or a very high proportion of debt should raise questions about the outlook of senior management, and/or the bets they are making. Again, odd categories of capital (e.g., exchangeable subordinated bonds) may indicate managerial creativity, or they may indicate desperation on the part of management—either way, they should invite the thoughtful reader of the annual report to dig deeper.

The balance sheet of PepsiCo as of December 27, 2008, is given in Exhibit 1.2. The firm clearly appears to be *solvent* in general terms, since the assets (about \$36 billion) handily exceed liabilities (about \$24 billion). The firm appears to be *liquid* as well: Current assets (totaling \$10.8 billion) exceed current liabilities (accounts payable,

Exhibit 1.2 PepsiCo Balance Sheets

Consolidated Balance Sheet, PepsiCo, Inc. and Subsidiaries
(in millions except per share amounts)

*Fiscal years ended December 27, 2008, and
 December 29, 2007*

	2008	2007
ASSETS		
Current Assets		
Cash and cash equivalents	\$ 2,064	\$ 910
Short-term investments	213	1,571
Accounts and notes receivable, net	4,683	4,389
Inventories	2,522	2,290
Prepaid expenses and other current assets	1,324	991
Total Current Assets	10,806	10,151
Property, Plant, and Equipment, net	11,663	11,228
Amortizable Intangible Assets, net	732	796
Goodwill	5,124	5,169
Other nonamortizable intangible assets	1,128	1,248
Nonamortizable Intangible Assets	6,252	6,417
Investments in Noncontrolled Affiliates	3,883	4,354
Other Assets	2,658	1,682
Total Assets	\$ 35,994	\$ 34,628
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current Liabilities		
Short-term obligations	\$ 369	\$ 0
Accounts payable and other current liabilities	8,273	7,602
Income taxes payable	145	151
Total Current Liabilities	8,787	7,753
Long-Term Debt Obligations	7,858	4,203
Other Liabilities	7,017	4,792
Deferred Income Taxes	226	646
Total Liabilities	\$ 23,888	\$ 17,394
Commitments and Contingencies		
Preferred Stock, no par value	\$ 41	\$ 41
Repurchased Preferred Stock	(138)	(132)
Common Shareholders' Equity		
Common stock, par value $1\frac{2}{3}$ per share (authorized 3,600 shares, issued 1,782 shares)	30	30
Capital in excess of par value	351	450
Retained earnings	30,638	28,184
Accumulated other comprehensive loss	(4,694)	(952)
Repurchased common stock, at cost (229 and 177 shares, respectively)	(14,122)	(10,387)
Total Common Shareholders' Equity	\$ 12,203	\$ 17,325
Total Liabilities and Shareholders' Equity	\$ 35,994	\$ 34,628

Source: 2008 PepsiCo, Inc. Annual Report.

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accruals, and taxes payable, totaling about \$8.8 billion). PepsiCo's mix of assets doesn't seem unusual—certainly the concentration in fixed assets is understandable because of the capital intensity of that business. Finally, the financing mix of the firm shows a modest increase in the use of debt financing from 2007 to 2008—long-term debt has increased by \$3.6 billion. Overall, the balance sheet raises no red flags.

Step 5: Review the Statement of Cash Flows

The statement of cash flows reports the cash receipts and outflows classified as operating, investing, and financing activities—this breakdown helps the reader determine where changes in cash emerge. The key questions a reader should ask include:

- Was the firm a net user or generator of cash for the year?
- What operational, investing, or financing elements proved to be major drivers of cash flow?
- Are there any major departures in the trends of the cash flow items?

Exhibit 1.3 gives PepsiCo's statement of cash flows from its 2008 Annual Report. This shows that the firm was a net generator of cash from operations in 2008 (about \$7.0 billion), which was in line with prior years. Net investing and financing activities are significant uses of cash, totaling \$2.7 billion and \$3.0 billion, respectively, in 2008. The individual line items suggest a couple of noteworthy points: (1) capital spending has been consistently high, and modestly rising each year, and (2) the company has been increasing the spend rate for both dividends and share repurchases. Both of these dynamics are consistent with the CEO's message of growth and returns to shareholders highlighted earlier. Overall, the statement of cash flows does not give any reason for concern, and in effect shows strong cash management.

Step 6: Read the Footnotes to the Financial Statements

A set of footnotes immediately follows the financial statements, typically spans many pages, and is considered by regulators to be an integral part of the financial statements. The footnotes tend to amplify and clarify information not readily apparent from reference to the statements themselves. For instance, the footnotes to PepsiCo's report offer, among others, the following important information:

- A breakdown of revenue, operating income, capital expenditures, and depreciation expenses by PepsiCo's unique divisions.
- A detailed analysis of a \$543 restructuring charge taken in 2008.
- A summary of significant accounting policies adopted by PepsiCo.
- Expanded detail of specific line items contained in the financial statements, including income taxes, fixed assets, and pension obligations.

Footnotes can be very technical and difficult for the novice to understand. But most users of annual reports would tell that they contain many important insights about a company not found elsewhere. At a minimum, footnotes should be referenced as necessary when questions arise in your review of the financial statements.

Exhibit 1.3 PepsiCo Statement of Cash Flows

**Consolidated Statement of Cash Flows, PepsiCo, Inc. and Subsidiaries
 (in millions)**

<i>Fiscal years ended December 27, 2008, December 29, 2007, and December 30, 2006</i>	2008	2007	2006
Operating Activities			
Net income	\$ 5,142	\$ 5,658	\$ 5,642
Depreciation and amortization	1,543	1,426	1,406
Other adjustments, net	532	(84)	118
Deferred income taxes and other tax charges and credits	573	118	(510)
Change in net current assets	(424)	25	(569)
Other, net	(367)	(209)	(3)
Net Cash Provided by Operating Activities	\$ 6,999	\$ 6,934	\$ 6,084
Investing Activities			
Capital spending	\$ (2,446)	\$ (2,430)	\$ (2,068)
Sales of property, plant, and equipment	98	47	49
Proceeds from (investment in) finance assets		27	(25)
Acquisitions and investments in noncontrolled affiliates	(1,925)	(1,320)	(522)
Cash restricted for pending acquisitions	(40)		
Cash proceeds from sale of PBG and PAS stock	358	315	318
Divestitures	6		37
Short-term investments	1,282	(383)	2,017
Net Cash Used for Investing Activities	\$ (2,667)	\$ (3,744)	\$ (194)
Financing Activities			
Proceeds from issuances of long-term debt	\$ 3,719	\$ 2,168	\$ 51
Payments of long-term debt	(649)	(579)	(157)
Short-term borrowings, net	445	(395)	(2,341)
Cash dividends paid	(2,541)	(2,204)	(1,854)
Share repurchases	(4,726)	(4,312)	(3,010)
Proceeds from exercises of stock options	620	1,108	1,194
Excess tax benefits from share-based payment arrangements	107	208	134
Net Cash Used for Financing Activities	(3,025)	(4,006)	(5,983)
Effect of exchange rate changes on cash and cash equivalents	(153)	75	28
Net Increase/(Decrease) in Cash and Cash Equivalents	\$ 1,154	\$ (741)	\$ (65)
Cash and Cash Equivalents, Beginning of Year	910	1,651	1,716
Cash and Cash Equivalents, End of Year	\$ 2,064	\$ 910	\$ 1,651

Source: 2008 PepsiCo, Inc. Annual Report.

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Step 7: Read Management's Discussion of the Year's Performance

Finally, an annual report will contain a detailed discussion of the year just completed, called the Management Discussion and Analysis (MD&A). The management discussion can reflect management's efforts to influence the reader's assessment of the company, and PepsiCo's MD&A is no exception. For that same reason, however, the MD&A helps the reader cultivate a critical frame of mind necessary for fully understanding the financial statements.

The formal, defined purpose of the MD&A is "to provide to investors and other users information relevant to an assessment of the financial condition and results of operations of the registrant as determined by evaluating the amounts and certainty of cash flows from operations and from outside sources" (SEC Reg S-K, Item 303). Ideally, it should be management's perception of its finances and operations, and it provides an opportunity to disclose known trends and uncertainties, to present detailed analyses of important year-to-year changes that are material to operations, and to clarify and provide context to its operation that are not readily apparent through reference to the financial statements. Many readers of annual reports contend that this is the most important section of the document. As one small example, a review of PepsiCo's MD&A reveals that 2008 profits were adversely impacted by both unfavorable commodity price hedges and higher raw materials costs. While higher costs were observable from the trends in financial statement values, management has now put context around these results that could not be found elsewhere.

Assessing the Financial Health of the Firm

Simply reading an annual report does not always give one the basis to conclude whether a firm is ultimately healthy. Further analysis can reward the reader with fresh insights. Financial analysts and academic researchers have developed an array of ratios found to be particularly useful in providing a deeper understanding of the firm. This collection of ratios includes methods for analyzing operating performance, financial condition, cash flow, liquidity, capital structure, and risk. Although there is no fixed set of such metrics and individual analysts typically will rely on their own personal set of assessment tools, there is a core set commonly used.

In this section, certain key ratios are illustrated in the context of how further information can be extracted from financial reports. As you consider the metrics illustrated, remember that each is just one piece of the mosaic that builds a more complete picture of the firm. A simple piece of data, by itself, does not tell us much. At the end of 2008, for instance, PepsiCo had \$36 billion in assets and over \$5.1 billion in earnings. Do these magnitudes matter? These numbers seem large, but how large are they really? Only when one analyzes the relative relationships of these amounts, compared to appropriate benchmarks, can one see the whole picture. An astute analyst looks for patterns, changes, unusual relationships, and values that seem to defy explanation.

Examining sets of key ratios, through comparisons of the same firm across time and/or against its peers, can help identify strengths and weaknesses of a company, and where management focuses its efforts. Financial ratios show the performance of the firm in four important areas:

1. *Profitability* is measured both in terms of profit or expense margins and as investment return. Investors typically will focus on *return on assets*, *return on equity*, and *profit margin*.

2. *Leverage* ratios measure the use of short-term and long-term debt financing by the firm. In general, higher usage of debt increases the risk of the firm, and is of particular concern during times of economic recession. Higher ratios of *debt to total capital invested* suggest a company seeking higher net returns, but one also willing to take on higher financial risk. The ratio of *times interest earned* measures the ability of the firm to cover its interest payments; lower levels of this ratio suggest high risk and poor relative operating performance.
3. *Asset efficiency and utilization* ratios measure how well the firm deploys its assets. For instance, the *asset turnover ratio* (sales over assets) indicates how many dollars of sales are generated per dollar of assets in use; a higher figure suggests more efficiency. Over the long term, differences in the *growth rates* of sales and assets can lead to production problems of over- or undercapacity. *Days receivables* and *days inventory* together indicate how quickly the firm converts its manufacturing or purchasing activities to cash from the customer. The longer this process, the less efficient the firm.³
4. *Liquidity* ratios measure the resources available to meet short-term financial commitments, should that be required. The *current ratio* answers the question of whether the company has enough current assets to cover all current liabilities. The *quick ratio* is even more restrictive on this dimension, and is the ratio of only cash and short-term investments (i.e., those assets that can be liquidated quickly) to all current liabilities.

Often it can be difficult to assemble a unified view of the firm from these ratios. Fortunately, the *DuPont system of ratios* can help analysts integrate their insights. The DuPont system was developed during World War I when the financial officers of E.I. du Pont de Nemours and Company sought a system to assess the health of their firm, and of the segments within the firm. This system decomposes *return on equity* into several constituent pieces: *profit margin*, which measures the profitability of each dollar of revenue; *sales turnover*, which measures the dollars of sales produced by each dollar of assets; and the ratio of *assets to equity*, which measures the *financial leverage* of the company, or the dollars of assets carried by each dollar of equity. Algebraically, the product of these three components is the return on equity:

$$\begin{aligned}\text{Return on Equity} &= \text{Profit Margin} \times \text{Sales Turnover} \times \text{Financial Leverage}^4 \\ (\text{Profit/Equity}) &= (\text{Profit/Sales}) \times (\text{Sales/Assets}) \times (\text{Assets/Equity})\end{aligned}$$

By examining the DuPont system for comparative years, it is possible to determine the sources of changes in return on equity.

Exhibit 1.4 summarizes example ratios from each of the four broad groupings for PepsiCo. You will observe from this summary particularly strong levels but declining trends in profitability during 2008. The one exception is return on equity, consistent with PepsiCo's stated dividend payout and share repurchase program, activities that reduce the equity base and increase this ratio, on average. The company has expanded its leverage during the year, and also has become slightly less efficient in its use of assets. The increased leverage is certainly no cause for alarm, as the interest coverage ratios indicate that PepsiCo easily has the ability to cover current interest charges. Net liquidity has remained somewhat constant. On the whole, the levels and trends in these ratios indicate a financially strong company, but one impacted by the economic recession that

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Exhibit 1.4 PepsiCo Ratio Analysis

Ratio Analysis of Financial Statements, PepsiCo, Inc. and Subsidiaries

*Fiscal years ended December 27, 2008, and
 December 29, 2007*

	2008	2007	2006
<i>Profitability</i>			
Return on Equity (%) (Net Income/Stockholders' Equity)	42.1%	32.7%	—
Return on Assets (%) (Net Income/Assets)	14.3%	16.3%	—
Return on Net Assets (%) (Net Income/Assets—Payables and Accruals)	18.6%	21.1%	—
Return on Sales (%) (Net Income/Revenues)	11.9%	14.3%	16.1%
Operating Profit Margin (%) (Operating Profit/Revenues)	16.0%	18.2%	18.5%
<i>Leverage</i>			
Debt-to-Equity (%)	67.4%	24.3%	—
Debt-to-Total Capital (%)	22.9%	12.1%	—
Times Interest Earned (EBIT/Interest Expense)	22.3	35.1	30.2
<i>Asset Efficiency and Utilization</i>			
Asset Turnover (Assets/Revenues)	0.83	0.88	—
Revenue Growth (%)	9.6%	12.3%	—
Asset Growth (%)	3.9%	—	—
Days Receivable ($365 \times \text{Receivables/Revenues}$)	39.5	40.6	—
Days Inventory ($365 \times \text{Inventory/Cost of Sales}$)	45.2	46.3	—
<i>Liquidity</i>			
Current Ratio (Current Assets/Current Liabilities)	1.23	1.31	—
Quick Ratio ((Cash + Short-Term Investments)/Current Liabilities)	0.26	0.32	—

Source of data underlying the ratios: 2008 PepsiCo, Inc. Annual Report.

Source of ratios: Author's analysis.

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began in 2007. There appears to be no cause for concern, but net trends have been on the decline. The careful analyst would examine both the *size* and the *trend* of each of these ratios over longer periods and, if possible, compare them to the same ratios for peer firms (the Coca-Cola Company, for instance).

Managerial Accounting: Assessing Performance Against a Plan

The financial accounting process described earlier presents data in a form useful to outsiders such as investors, creditors, analysts, and regulators. The financial statements produced from this process are, unfortunately, often too coarse and too historically based

to be of much use to operating managers concerned with driving future performance. The field of study called *managerial accounting* is designed to help provide the data that aids most directly in this task. This section briefly illustrates the application of some managerial accounting concepts frequently used by firms. Note, however, that this field is by its nature one with enormous flexibility and diversity of practice. It is not governed by codified rules and regulations, but rather by established conventions and practices that have evolved over time.

Managerial accounting, broadly speaking, embraces many of the tools and concepts of financial accounting, but the objective is typically to assess *performance against a plan or a standard*. The ultimate goal is to help the operating manager understand his or her division's business dynamics so that improvements, efficiencies, and growth opportunities can be identified. A plan, or budget, is a target or forecast of performance, expected but uncertain. A standard, such as a standard cost, is similar but here suggests an accepted norm against which an actual figure may be compared. For instance, one can assess performance of a project or business in terms of *variance* from the benchmark. A *favorable variance* is either actual revenues higher than expected or actual costs lower than expected. An *unfavorable variance* is the reverse.

Variances in revenues and costs can be decomposed into variances due to price (or cost) changes and variances due to volume changes. Whether a variance arises because of variances in prices or variances in volumes is extremely valuable information for the manager. As one example, this information helps both to remedy problems and to reward certain behaviors. Consider the following simple hypothetical case regarding the DVD release of an animated children's movie by Backyard Production, Inc. (BPI).

Backyard Production, Inc.: DVD Release

At the beginning of 2009, DVD sales for the year of BPI's animated movie were expected to realize revenues of \$80 million. This was based on an assumed sale of eight million units at an average price of \$10 each. At the core of BPI's sales strategy was a plan to aggressively market the DVD through an array of national discount retailers. The expected \$10 per unit revenue was a net "best guess" based on how substantial the concessions demanded by those retailers would be. The DVDs were to be manufactured in Beijing, China, at an expected unit cost of \$3.00. The initial production contract specified a production volume of eight million units for the year. Changes in the production volume, up or down, would entail price increases to BPI because of substantial human resource and setup costs incurred by the manufacturer.

At the end of the year, BPI's marketing manager could hardly control her excitement as she reported that revenues on the DVD release would be \$85 million. Units sold were 10 million at an average net price of \$8.50. She pointed out that the submission of cash rebate coupons had been higher than expected, as had been the concessions made to retailers, but this was more than offset by the increase in sales volume. BPI's purchasing manager was not as happy. He reported that the increased volume had prompted the supplier to impose surcharges on the price to BPI: The average unit cost of the DVDs was \$4.00. BPI's president was also disappointed that the project had earned only \$45 million, instead of the budgeted \$56 million. What had gone wrong and why? What part of this process contributed most to the missed profits? Can this be quantified?

The answers to these questions lie with conventional managerial accounting tools that help illustrate some of the internal processes used by the firm. In this simple case, profits

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Exhibit 1.5 BPI Budget versus Actual Profits

	Budget	Actual
Revenue	\$80,000,000	\$85,000,000
Costs	24,000,000	40,000,000
Net Profit	\$56,000,000	\$45,000,000

were missed, and by definition this would relate to either revenue or costs, or both. Exhibit 1.5 summarizes the original budget versus actual results.

There are just four levers at work that would describe the profit miss: price received, quantity sold, quantity produced, and manufacturing cost. Intuition should tell you that together they describe the \$11 million missed profit. Variance analysis will tell you exactly by how much. These calculations are illustrated as follows:

Total Revenue Variance: Price Received and Volume Sold

$$\begin{aligned} \text{Sales Price Variance} &= (\text{Actual Price} - \text{Standard Price}) \times (\text{Actual Units Sold}) \\ &= (\$8.50 - \$10.00) \times (10,000,000) = -\$15,000,000 \end{aligned}$$

The sales price variance was unfavorable to BPI.

$$\begin{aligned} \text{Sales Volume Variance} &= (\text{Standard Price}) \times (\text{Actual Volume} - \text{Expected Volume}) \\ &= \$10.00 \times (10,000,000 - 8,000,000) = \$20,000,000 \end{aligned}$$

The sales volume variance was favorable to BPI.

Overall, the special price discounts and promotions produced an increase in volume that more than compensated for the lower average price realized. The revenue variance analysis shows that the promotional effort paid off:

$$\begin{aligned} \text{Total Revenue Variance} &= (\text{Volume Variance}) + (\text{Price Variance}) \\ &= \$20,000,000 + -\$15,000,000 = \$5,000,000 \end{aligned}$$

The pickup in volume had been more than enough to compensate for the decline in price.

Total Cost Variance: Price Paid and Volume Produced

Regarding the cost to BPI of producing the DVDs by the manufacturer, we can analyze variances of actual from budget using similar formulas:

$$\begin{aligned} \text{Price (or Cost) Variance} &= (\text{Actual Unit Cost} - \text{Budgeted Unit Cost}) \\ &\quad \times (\text{Actual Unit Volume}) \\ &= (\$4.00 - \$3.00) \times 10,000,000 = \$10,000,000 \end{aligned}$$

The unit cost variance was unfavorable to BPI, given that it cost more to have the DVDs made than had been originally budgeted. The increase in cost was not unexpected, due

to the clause in the supply contract that permitted the supplier to increase prices if the production volume was modified.

$$\begin{aligned} \text{Volume Variance} &= (\text{Budgeted Unit Cost}) \times (\text{Actual Volume} - \text{Budgeted Volume}) \\ &= \$3.00 \times (10,000,000 - 8,000,000) = \$6,000,000 \end{aligned}$$

The volume variance was also unfavorable to BPI. This stands to reason since it had to buy more units than expected, thus paying more in total costs.

Overall, the total cost variance was unfavorable by \$16 million:

$$\begin{aligned} \text{Total Cost Variance} &= (\text{Price Variance}) + (\text{Volume Variance}) \\ &= \$10,000,000 + \$6,000,000 = \$16,000,000 \end{aligned}$$

The DVD release project turned out worse for BPI than expected. Putting the variance analysis of sales (revenue) and costs together as in Exhibit 1.6 helps better show the exact contributions of the different levers and highlights the source of BPI's disappointment. Remember that price decreases and cost increases are unfavorable outcomes (U) and that volume increases are favorable outcomes (F) for sales activities but not for production.

The row totals show that the \$11 million shortfall in budgeted profits was due to the fact that production costs rose faster than sales revenues. But before we criticize the purchasing manager, consider that part of the rise in costs is due to the fact that BPI simply ordered more units than it had budgeted. Also, look at the column totals. The columns show that the unhappy news originates in the price areas, and that culpability is *shared* between the purchasing manager (who negotiates the supply contracts) and the marketing manager (who handles sales policy): 60 percent of the unfavorable price variance of \$25 million originates in sales, and the remainder in production.

A general manager can use analysis such as this to take thoughtful action. One possibility is that BPI should stiffen its spine in negotiations with suppliers and customers. Perhaps the managers of purchasing and marketing should be sent to a negotiation skills workshop. Maybe the purchasing manager should be assisted by a skillful lawyer who could draft an agreement limiting the supplier's ability to hike the unit price. BPI might consider searching for suppliers with more flexible production operations for which a change order is not an expensive proposition. And finally, BPI should reconsider the strategy of selling through discounters—they imposed internal turbulence (in the form of higher-than-expected volume) that rippled backwards through the supply chain, and left BPI earning \$11 million less than had been budgeted.

Exhibit 1.6 BPI Variance Analysis of Budget versus Actual

	Price Variances	Volume Variances	Total Variances
Sales	\$15,000,000 (U)	\$20,000,000 (F)	\$ 5,000,000 (F)
Production	10,000,000 (U)	6,000,000 (U)	16,000,000 (U)
Total	\$25,000,000 (U)	\$14,000,000 (F)	\$11,000,000 (U)

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Accounting in MBA Curricula

The field of accounting as taught in MBA programs tends to embrace four distinct areas: (1) financial accounting, (2) managerial accounting, (3) taxation, and (4) financial statement analysis. Introductory courses in financial accounting are virtually always required, although some MBA programs allow course waivers for certified public accountants (CPAs) and others with extensive professional experience. Over the past decade, business school students' interests have tended to shift more toward finance-related career tracks, and with this shift the demand for financial accounting–related electives has grown. These courses most commonly are those related to advanced financial accounting theory.

Managerial accounting is defined by the development of accounting information with a focus on the internal use of that information by managers and executives to operate their businesses. The field is centered on the study of accounting as a tool for managerially relevant decision making within the organization. A managerial curriculum typically includes the topics of strategic and financial planning/budgeting, management control and performance measurement, management incentives, capital expenditure planning, evaluation and budgeting, transfer pricing, and strategic costing. Courses in managerial accounting are required in most MBA programs (but not all). For instance, of the top six programs as ranked by *BusinessWeek* in 2008, four required a specific stand-alone managerial accounting course, one blended both financial and managerial topics in a single course, and one other offered managerial accounting as an elective course.

Taxation is a discipline focused on understanding tax law. While the field itself is quite broad, within the bounds of graduate business education it can be more tightly defined as understanding the motives and managerial strategies related to the imposition of tax law. The curricula of MBA programs typically offer only electives in the field of taxation, with these courses focused on understanding how tax issues are incorporated in general management strategies (e.g., mergers and acquisitions).

Finally, financial statement analysis is a course offered in all MBA programs, in virtually all instances as an elective. The approaches for this course will vary considerably, but the objective is virtually always the same—to develop tools pertaining to how to use external financial reports in the analysis of the firm. Most courses include topics on screening, forecasting, and valuation techniques, with the ultimate goals of assessing firm performance and determining firm value.

Concluding Remarks

A basic mastery of accounting is absolutely essential for the success of the modern manager. Such mastery should include an ability to read financial statements and derive basic insights about the health of the enterprise from them, and to assess the performance of a business or project relative to a budget or standard using variance analysis of prices, costs, and volume.

Perhaps more importantly, a basic mastery of accounting will instill in the manager a general sense of irony about performance measurement. On close examination, one sees that the process of preparing a presentation about the condition of the firm is heavily laden with judgment. Financial accounting is nuanced, and as such requires careful attention to detail and enhance disclosures that help increase transparency. Managers

need to recognize and understand the many alternatives they face in presenting financial results, and make faithful, ethical choices in that presentation. Investors and creditors need to read financial statements with thoughtful caution, recognizing that accounting reality is sometimes an abstraction from true economic reality.

Finally, accounting presents an extremely important framework for thinking about the internal workings of the firm. Assets must equal liabilities and owners' equity, and transactions must balance. Relationships across accounts must be understood, and from this an assessment of performance, risk, and overall financial health can begin. Viewed from this standpoint, accounting is not a narrow and technical specialty, but rather an essential tool for corporate renewal and transformation.

Notes

1. The "going concern" assumption holds that the firm will operate for the foreseeable future, and that its assets will not be liquidated hastily in a fire sale. For instance, hasty liquidation of inventory ordinarily realizes lower values than will the regular conduct of business.
2. In the balance sheets of many companies headquartered outside the United States, the order of priority differs greatly. Don't let the differences confuse you. Just remember that $\text{Assets} = \text{Liabilities} + \text{Owners' Equity}$.
3. *Days receivables* is calculated as the ratio of accounts receivable divided by annual sales, multiplied by 365 days. *Days inventory* is inventory divided by annual cost of sales, multiplied by 365 days.
4. *Financial leverage* generally refers to the use of debt financing. A highly levered firm has a high proportion of debt in its capital structure. There are numerous ratios that measure leverage, but one of the most telling is the ratio of assets to equity. High leverage would be associated with a high ratio.

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Exhibits 1.1–1.4: PepsiCo Financial Statements and Financial Ratios