



# VALUATION

FOR

## MERGERS AND ACQUISITIONS

SECOND EDITION

BARBARA S. PETITT

KENNETH R. FERRIS

# Valuation for Mergers and Acquisitions

Second Edition

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# Preface

Valuation is the essence of finance. It asks the question, “What is the ‘fair’ price to pay for an asset that has a set of uncertain future cash flows?” This book presents a practitioner-oriented view of the fundamentals of valuation in the context of mergers and acquisitions. Valuation is considered to be an art, not a science. Thus, the reader will find that there are many “rules of thumb” and few inviolable principles to guide them.

The metrics used for valuing companies are not well-defined, varying according to the objectives of the valuation, the characteristics of the company and its industry, and the preferences and expertise of the individual performing the valuation. Consequently, corporate executives and valuation analysts face many choices and dilemmas as they try to assess a company’s value. Throughout this book, we discuss a range of valuation methods, including multiples, discounted cash flow models, economic income models, and option pricing models. We offer practical solutions for helping the reader make informed choices and for dealing with common dilemmas. The valuation methods discussed are principally for use in non-financial companies; the topic of valuing financial companies is beyond the scope of this book.

To use this book effectively, the reader will need an understanding of the fundamentals of accounting and finance. Furthermore, a background in financial modeling with Excel is also beneficial.

*Barbara S. Petitt and Kenneth R. Ferris*  
*May 2013*



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# 1

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## Valuation: An Overview

### Market View

What do Daimler-Benz, Hewlett-Packard (HP), Microsoft, Quaker Oats, and Sprint have in common? They are all multinational companies with established brands and products. But they have something else in common: They have all made bad acquisitions! In 1994, Quaker Oats acquired Snapple for \$1.7 billion; it sold Snapple to an investment company for only \$300 million two years later. Daimler purchased Chrysler for \$36 billion in 1998; it got only \$7.4 billion when it sold 80 percent of Chrysler to a private equity firm nine years later. HP, Sprint, and Microsoft also failed to make their acquisitions of Electronic Data System, Nextel Communications, and aQuantive work. These companies had to write off a significant portion of the price they paid for their targets—58, 86, and 98 percent, respectively. Unfortunately, these examples are not exceptional. Bad acquisitions happen in all countries, in all industries, and during both bull and bear markets.

Acquisitions fail for different reasons, but one recurrent theme is that acquirers overpay for the target. They overestimate either the target's value, the expected synergies associated with the acquisition, or both. When the benefits of the acquisition fail to materialize, an acquirer has to write off part, and sometimes all, of the purchase price. Some companies, such as Quaker Oats and Daimler, might be able to recoup at least a small portion of the loss; others are not so fortunate and end up shuttering the business they acquired.

Do not conclude, however, that all mergers and acquisitions (M&As) are bound to fail. Some of the strongest companies as of this writing are the result of large M&As: The combinations of Exxon and Mobil in 1998, Vodafone and Mannesmann in 1999, Pfizer and Warner Lambert in 1999, and JPMorgan Chase and Bank One in 2004 created leaders in the oil and gas, telecommunication, pharmaceutical, and banking industries, respectively. Acquisitions that are well planned and well executed offer companies the opportunity to grow successfully.

One of the critical aspects of the planning stage is the valuation of the target and the expected synergies between the acquirer and the target. As this book illustrates, overestimating the target's value and/or the expected synergies associated with the acquisition is a sure path to overpaying and reducing the likelihood of making the acquisition a success.

\* \* \*

Probably no question in the financial community is asked more often than "What is this investment worth?" Whether the investment is a share of stock, a bond, or a company, assessing the value of an investment is often the ultimate objective of the corporate executive or analyst.

The fundamental tenet of valuation is well established in corporate finance: The value of an asset (or bundle of assets) today is the present value of the future cash flows that the asset is expected to provide its owners during its economic life. Thus, a significant aspect of valuation involves modeling the future cash flows associated with an investment and then deciding how to value those cash flows. Because financial modeling can be time consuming and often imprecise, analysts frequently turn to shortcut techniques that (they hope) yield similar results. Alternative valuation methods have also emerged because not all investments have sufficiently predictable cash flows to permit effective financial modeling. The chapters that follow consider a variety of valuation methods: discounted cash flow models, price and enterprise value multiples, economic value analysis, and real option analysis. We consider each of those valuation methods in the context

of corporate valuation for M&A purposes, although they can be used for a variety of objectives.

This chapter addresses the following key questions:

- What are the principal reasons companies merge with or acquire one another?
- Do M&As create shareholder value?
- Why do acquirers pay a premium to take control of a target?
- What are the typical steps to follow when valuing a company?
- What are the most frequently used valuation methods for assessing a company's value?

## **1 Why Companies Merge or Acquire: A Historical Perspective**

Companies grow in two main ways: either organically or by merging with or acquiring other companies. Although the number and volume of M&As broke records in the first decade of the 21st century, these transactions are not a recent phenomenon. We begin our journey by identifying the periods that were characterized by a high level of M&A activity and then summarize the major reasons companies make acquisitions.

### **1.1 Mergers and Acquisitions Waves**

M&As come in “waves.” Martynova and Renneboog (2008) reviewed a century of transactions and identified six major waves of M&As: 1890–1903, 1910–1929, 1950–1973, 1981–1989, 1993–2001, and 2003–2007. Their research shows that the end of a wave typically coincides with a crisis or a recession—for example, the most recent wave ended with the subprime debt crisis in 2007. What triggers the start of a wave varies across time, but three factors have clearly driven M&A activity since the end of the 19th century: industrial and technological shocks, regulatory changes, and credit availability.

The 1890s and early 1900s witnessed what is considered the first wave of M&As. Companies in the United States tried to build monopolies in their respective industries by forming trusts—in essence, an extreme form of **horizontal integration**. Examples include the creation of Standard Oil Company of New Jersey in 1899, United States Steel Corporation in 1901, and International Harvester Corporation in 1902. After the government enacted laws prohibiting anticompetitive behavior, acquisition-oriented companies turned their attention to **vertical integration** as a means of growth. Vertical integration is perhaps best illustrated by the oil and gas industry; companies that began as pure oil exploration businesses eventually moved into refining, transportation, and, ultimately, retailing of oil and gas products.

Most of the M&As that took place during the second wave in the 1920s involved small U.S. companies that were left outside the monopolies created during the previous wave. Those companies merged with or acquired one another to gain economies of scale and to be able to compete with the dominant player in their industry. The 1929 crisis and the depression that followed put an end to this second wave of M&As. Because of World War II, M&A activity remained low until the 1950s.

The 1950s, 1960s, and early 1970s witnessed a third wave of M&As, during which companies tried to diversify their revenue streams and, in doing so, reduce their perceived riskiness. This trend led to the creation of **conglomerates** and holding companies composed of many unrelated businesses. General Electric Company is a typical example of this trend. However, today's capital markets no longer place a premium on highly diversified companies. In fact, the share prices of most highly diversified companies are subject to a **conglomerate discount** because equity markets struggle to see the benefits of these complex enterprises.<sup>1</sup> In essence, equity markets now prefer “pure plays”—that is, companies that operate in a single industry—to highly diversified companies, in large part because understanding and valuing pure plays is easier than conglomerates. This third wave of M&As peaked in 1968 and collapsed with the oil crisis in 1973.

The late 1970s and early 1980s were characterized by relatively high inflation rates and, consequently, high borrowing costs. To remain profitable, many companies sought ways to reduce both operating

and financing costs. Reaching a critical size was often viewed as *the* way to survive the industry “shake-outs” that inevitably characterize such economic periods, giving rise to the fourth wave of M&As. Many companies merged with or acquire one another to take advantage of the economies of scale associated with larger-volume producers. Moreover, some companies saw M&As as a means to reduce their riskiness and lower their financing costs, which reached as high as 25 to 30 percent in some instances in the late 1970s and early 1980s.

The 1980s were also marked by deregulation and the creation and development of new instruments and markets. One such example is the “junk” bond market, or the market for bonds issued by companies with poor credit quality.<sup>2</sup> The availability of credit to finance highly risky companies and transactions fuelled an increase in **leveraged buyouts (LBOs)** and leveraged recapitalizations.<sup>3</sup> Some companies that had bought unrelated businesses during the previous wave took advantage of the booming M&A market to sell their poorly performing divisions and refocus on their core business. The stock market crash of 1987 and the collapse of several highly leveraged companies put an end to this fourth wave of M&As.

The 1990s saw new justifications for acquisitions emerge, paving the way for a fifth wave of M&As. Some companies made acquisitions to gain access to knowledge-based assets, particularly in the late 1990s, when the “first mover” advantage became highly prized. The 1990s also witnessed an increase in the number and volume of cross-border acquisitions. With the evolution of the global economy, many companies saw M&As as the quickest and least expensive means of acquiring a presence in a foreign country and preserving their place in the global economy. This latter trend was largely driven by the formation of multination trade zones such as the European Union (E.U.), Mercosur, and the North Atlantic Free Trade Agreement (NAFTA).

In addition, some companies viewed M&As as an opportunity to consolidate industries characterized by excess market participants and, hence, low profitability. These “consolidators” recognized that not every participant could survive such economic conditions and fostered a mentality of “Acquire or be acquired.” Examples of industries affected by this global trend include the oil and gas industry (consider the mergers of British Petroleum [BP] and Amoco, and of Exxon

and Mobil), the pharmaceutical industry (for example, the creations of Pharmacia, the result of the merger of Pharmacia & Upjohn with Monsanto, and of GlaxoSmithKline, the result of the merger of Smith-Kline Beecham and Glaxo Wellcome), and the automobile industry (think of the merger of Daimler and Chrysler, and the acquisition of Volvo by Ford). The burst of the dotcom bubble in 2000 and the recession that followed marked the end of this fifth wave of M&As.

M&A activity soon recovered, with a sixth wave starting in 2003. This wave saw the continuation of the two trends initiated in the 1990s: cross-border acquisitions and industry consolidations. But it was also reminiscent of the 1980s, in that leveraged transactions made a comeback. The low-interest environment coupled with the seemingly endless credit availability fuelled an increase in LBOs, many sponsored by private equity firms. Investors went in search of diversification benefits and higher yields. As they poured money into new asset classes such as private equity, large amounts of funds became available to take companies private and purchase divisions for sale. This sixth wave of M&As came to an abrupt end following the sub-prime debt crisis of 2007.

As of this writing, M&A activity is picking up, and some market participants are suggesting that a new wave of M&As could be underway. However, it is too early to tell.

## 1.2 Motivations for Mergers and Acquisitions

Companies make acquisitions for a long list of reasons. Some of these reasons are good, in that the motivation for the transaction is to maximize shareholder value. Unfortunately, other reasons are bad, or at least questionable.

Theoretically, companies should pursue an acquisition *only* if it creates value—that is, if the value of the acquirer and the target is greater if they operate as a single entity than as separate ones. Put another way, a merger or acquisition is justified if **synergies** are associated with the transaction. Synergies can take three forms: operating, financial, or managerial.

**Operating synergies** arise from the combination of the acquirer and target's operations. A first type of operating synergies is revenue

enhancement. It includes gaining pricing power in a particular market or being able to increase sales volume by accessing new markets—for example, by leveraging one company’s sales force or distribution network, or by selling one company’s products to the other company’s customers. A second type of operating synergies is cost reduction. As mentioned earlier, many companies view M&As as a way to reach a critical size and, consequently, be able to benefit from economies of scale with lower production costs. An acquisition might also generate cost savings in advertising, marketing, or research and development. Revenue enhancement and cost reduction are more likely in cases of horizontal integration and can also play a role in vertical integration.

**Financial synergies** come from lower financing costs. Big companies usually have access to a wider and cheaper pool of funds than small companies. One rationale for the third wave of M&As was that diversifying into unrelated businesses enabled companies to reduce risk and, therefore, increase their debt capacity and lower their before-tax cost of financing. The risk reduction benefit is compounded by the beneficial tax treatment of debt relative to equity. Thus, the more debt a company has in its capital structure, the lower its cost of financing, net of taxes.<sup>4</sup> History has shown, however, that companies tend to overestimate the risk reduction and tax benefits associated with M&As. Although financial synergies are a source of value, particularly in the case of leveraged transactions such as LBOs, they should not be the only motivation for a merger or acquisition.

**Managerial synergies** arise when a high-performing management team replaces a poor-performing one. One advantage of acquisitions is that they give the acquirer the opportunity to remove incompetent managers, which could improve the target’s performance.

Unfortunately, not all M&As are motivated by the goal of creating shareholder value. Research has shown that some managers look after their own self-interest instead of shareholders’.<sup>5</sup> They might use M&As to build empires and diversify their human capital, even if little or no value is associated with the merger or the acquisition.<sup>6</sup> Managers also sometimes suffer from **hubris**; they are overconfident in their ability to negotiate a good deal for their shareholders and then run the combined entity.<sup>7</sup> Thus, they tend to overpay for their acquisitions. Last, some managers go through an acquisition spree to deliver



growth and earnings targets, even if the acquisitions are not strategically sound or have a negative effect on the company's profitability and ability to create shareholder value.

## 2 Do Mergers and Acquisitions Create Shareholder Value?

Although evidence clearly indicates that the shareholders of a target profit from a merger or acquisition, the same cannot be said for the shareholders of the acquirer. An abundance of studies show that the share price of almost all targets increases around the announcement of a merger or an acquisition. However, the share price of acquirers rarely follows the same trend; the average share price performance of acquirers around the announcement of a merger or an acquisition is slightly negative, and acquirers commonly experience a significant decrease in share price after announcing their intention to merge with or acquire another company. Kengelbach and Roos, from the Boston Consulting Group (BCG) (2011), studied approximately 26,000 transactions completed between 1988 and 2010. They showed that the average share price performance over a seven-day window centered on the announcement date was 15.5 percent for the target but -1.0 percent for the acquirer. The study revealed that acquirers perform better if they purchase a foreign target instead of a domestic one, if they pay in cash rather than in securities or a mix of cash and securities, if they make only one acquisition, and if the acquisition takes place during a downturn rather than an upturn. A follow-up study by Kengelbach, Kemmer, and Roos (2012) also indicated that some sectors fare better than others. For instance, the share price performance for an average acquirer was 1.9 percent in the manufacturing sector but -2.2 percent in the telecommunication sector.<sup>8</sup>

This evidence suggests, among other things, that equity markets are skeptical about the ability of acquirers to create shareholder value. Whether offer prices are seen as excessive, the proposed synergies are thought unlikely to materialize, or current management is perceived as incapable of successfully merging two different cultures, equity markets doubt the value associated with most transactions. Sadly,

equity markets are correct: Few transactions achieve their anticipated gains. KPMG (2011) analyzed a large sample of M&As completed between January 2007 and July 2009 and showed that, in 44 percent of the transactions, the acquirer achieved either none or very little of the anticipated synergies. Moreover, Kengelbach, et al. (2012), observed that, in 2011, divestitures made up 45 percent of the number of M&As. As mentioned in the vignette at the beginning of this chapter, it is not unusual for companies to end up selling their poorly performing acquisitions.

To help understand why many M&As fail to create shareholder value, it is instructive to consider data on the premiums paid in these transactions. We turn to that topic now.

### 3 Merger and Acquisition Premiums

The **premium** in a merger or acquisition is defined as the difference between the offer price and the market price of the target before the announcement of the transaction. A substantial body of evidence indicates that M&A premiums average 20 to 30 percent above a target's preacquisition share price. For example, Kengelbach and Roos (2011) found that the average premium was 36 percent during the period 1990–2010. As conventional wisdom suggests, acquirers perform better when they pay a premium that is below average rather than above average. As mentioned earlier, a high premium is a sure path to overpaying and reducing the likelihood of making the acquisition a success.

M&A premiums are sometimes referred to as control premiums. In general, the target's shareholders demand them as compensation for transferring controlling interest in the target to the acquirer. Majority control in a company conveys many valuable rights and benefits, including control over all operating policies and decisions, the selection of management and the board of directors, and the distribution of cash to shareholders.

M&A premiums can also represent compensation for other economic benefits, such as the expected synergies associated with the transaction. They can reflect capital market pricing inefficiencies

as well, wherein a target is undervalued because the company or its industry is out of favor with investors.

If M&As yield these valuable economic rights and benefits, why do so many of them destroy value? The reasons are many, but the five principal explanations for value destruction appear to be the following:

- Overestimation of the target's value, primarily caused by an overestimation of the growth and/or market potential (a forecasting error problem).
- Overestimation of the expected synergies (another forecasting error problem).
- Overbidding and overpayment, which is often a consequence of management's hubris. The risk of overbidding and overpayment increases when several bidders are competing for the target because this heightened competition gives the target more bargaining power to negotiate a higher offer price and, thus, premium.
- Failure to undertake a thorough due diligence of the target.
- Failure to successfully integrate the target after the merger or the acquisition.

In essence, in about every other transaction, the acquirer's management commits some type of critical error—in the due diligence investigation, in the bidding process, or in the postacquisition integration of the target. How to avoid each of these pitfalls is beyond the scope of this book; instead, we focus on the process of assessing the target's value—namely, the specific accounting, finance, and taxation issues that the analyst must successfully deal with to estimate the value associated with a merger or acquisition.<sup>9</sup>

## 4 Valuation Process

Analysts frequently refer to five types of value: book value, break-up value, liquidation value, fundamental value, and market value.

- **Book value** refers to the accounting value of a company—that is, the value reported in the balance sheet. The book value of

equity, also referred to as the company's net worth, is equal to its total assets minus its total liabilities. It represents a company's residual value, assuming that assets can be sold for their reported values and that the proceeds are used to satisfy all liabilities at their recorded values.

- **Break-up value** refers to the amount that could be realized if a company were split into saleable units that could be disposed of in a negotiated transaction. This concept is especially relevant for companies composed of a variety of individual business units, divisions, or segments.
- **Liquidation value** refers to the amount that could be realized if a company were liquidated in a distress sale. A company's liquidation value is usually lower than its book and break-up values because assets that must be disposed of quickly are usually sold at a discount.
- **Fundamental value**, also called **intrinsic value**, refers to the value based on the after-tax cash flows that the company is expected to generate in the future, discounted at an appropriate rate that reflects the riskiness of those cash flows. It is a forward-looking concept and requires an assessment of a company's potential future cash flows.
- **Market value** refers to the value established in an orderly marketplace such as a securities market. For example, the market value of equity, also called the **market capitalization**, is equal to the share price multiplied by the number of shares outstanding.

Although all five types of value can be used for valuing a company, this book deals primarily with the assessment of *fundamental value* because it represents the “ongoing” value of a company. Thus, the value of a company is defined herein with reference to the future cash flows that a company is expected to generate.

The process of valuing a company usually involves five steps:

1. Identify and screen potential target candidates thoroughly to ensure that the proposed transaction is appropriate from a *strategic* standpoint.

2. Analyze the historical performance of the target to ensure that it is an appropriate partner from a *financial* standpoint, as well as to gain a thorough understanding of the target's business model, operations, and capital structure.
3. Forecast the future performance of the target by preparing pro forma financial statements. Nothing is more important in assessing a target's value than a complete and accurate modeling of the company's operations. This critical step requires a fine-grained understanding of the target's environment, its business model (including its revenue and cost drivers) and realistic assumptions about the target's future operations and, potentially, capital structure.
4. Apply one or several valuation methods to get an estimate or estimates of the target's value.
5. Assess the sensitivity of the key pro forma and valuation assumptions on the target's value.

Step 4 requires the analyst to select one or several valuation methods. In the next section, we present the most widely used valuation methods and give an overview of their main characteristics and uses.

## 5 Valuation Methods: An Overview

Several valuation methods are available, depending on a company's industry, its characteristics (for example, whether it is a start-up or a mature company), and the analyst's preference and expertise. In this chapter and the rest of the book, we focus on the mainstream valuation methods. These methods are classified into four categories, based on two dimensions. The first dimension distinguishes between direct (or absolute) valuation methods and indirect (or relative) valuation methods; the second dimension separates models that rely on cash flows from models that rely on another financial variable, such as sales (revenues), earnings, or book value.

As their name indicates, **direct valuation methods** provide a direct estimate of a company's fundamental value. In the case of public companies, the analyst can then compare the company's fundamental

value obtained from that valuation analysis to the company's market value. The company appears fairly valued if its market value is equal to its fundamental value, undervalued if its market value is lower than its fundamental value, and overvalued if its market value is higher than its fundamental value. In contrast, **relative valuation methods** do *not* provide a direct estimate of a company's fundamental value: They do not indicate whether a company is fairly priced; they indicate only whether it is fairly priced *relative* to some benchmark or peer group. Because valuing a company using an indirect valuation method requires identifying a group of comparable companies, this approach to valuation is also called the comparables approach.

Exhibit 1.1 provides an overview of the mainstream valuation methods.

### Exhibit 1.1 Overview of Valuation Methods

	<b>Direct (or Absolute) Valuation Methods</b>	<b>Relative (or Indirect) Valuation Methods</b>
Valuation methods that rely on cash flows	<p><i>Discounted cash flow models:</i></p> <p>Free cash flow to the firm model</p> <p>Free cash flow to equity model</p> <p>Adjusted present value model</p> <p><i>Option-pricing models:</i></p> <p>Real option analysis</p>	<p><i>Price multiples:</i></p> <p>Price-to-cash-flow ratio</p>
Valuation methods that rely on a financial variable other than cash flows	<p><i>Economic income models:</i></p> <p>Economic value analysis</p>	<p><i>Price multiples*:</i></p> <p>Price-to-earnings ratios (P/E ratio, P/EBIT ratio, and P/EBITDA ratio)</p> <p>Price-to-sales ratio</p> <p>Price-to-book ratio</p> <p><i>Enterprise value multiples:</i></p> <p>EV/EBITDA multiple</p> <p>EV/Sales multiple</p>

\* E stands for earnings; EBIT for earnings before interest and taxes; EBITDA to earnings before interest, taxes, depreciation, and amortization; and EV for enterprise value.

Academicians and practitioners are in relative agreement on what drives a company's fundamental value: its future cash flows. However, no consensus has settled on what drives a company's share price. In today's global economic environment, it would be naïve to suggest that any single factor drives share prices. Indeed, the proliferation of valuation methods partly reflects the financial community's inability to agree on exactly which factors are the primary drivers of share prices—cash flows, sales, accounting earnings, book value, or economic income. The dominant viewpoint is that changes in share prices are most closely related to changes in future cash flows, with all else being equal. This is the viewpoint this book endorses.

We now turn to a closer examination of the valuation methods presented in Exhibit 1.1.

## 5.1 Relative Valuation Methods

The notion that “time is money” or, stated alternatively, that “time is an expensive and limited commodity” is one of the principal reasons for relative valuation methods. Other reasons are that they are simple to apply and easy to understand. In essence, relative valuation methods give corporate executives and analysts a “quick and dirty” way to estimate the value of a company.

Relative valuation methods rely on the use of multiples. A **multiple** is a ratio between two financial variables. In most cases, the numerator of the multiple is either the company's market price (in the case of price multiples) or its enterprise value (in the case of enterprise value multiples). The **enterprise value** of a company is typically defined as the market value of its capital (debt and equity), net of cash. The denominator of the multiple is an accounting metric, such as the company's earnings, sales, or book value. Multiples can be calculated from per-share amounts (market price per share, earnings per share, sales per share, or book value per share) or total amounts. Note that whether the analyst uses per-share amounts or total amounts does not affect the multiple, as long as the same basis is used in both the numerator and the denominator.

### 5.1.1 Price Multiples

The most popular price multiples are earnings multiples. The **price-to-earnings (P/E) ratio**, which is equal to a company's market price per share divided by its earnings per share (EPS), is the most widely used earnings multiple. It provides an indication of how much investors are willing to pay for a company's earnings. For example, a company whose P/E ratio is 15 is said to be selling for 15 times earnings; put another way, investors are willing to pay \$15 for each \$1 of current or future earnings. Companies with high earnings growth prospects usually carry high P/E ratios because these companies are expected to be able to reward investors with a quicker and larger return on their investment in the form of dividends, increase in share price, or both.

Because the earnings of a company are influenced to varying degrees by how the company is financed (with debt or with equity) and where it pays income taxes, some analysts have turned to a variant of the P/E ratio that removes the effect of a company's capital structure and income taxes on its earnings. This variant is the price-to-earnings before interest and taxes (P/EBIT) ratio. Still other analysts, worried about the distortive effect on earnings of accounting policies with respect to the depreciation of tangible assets and the amortization of intangible assets, prefer to use the price-to-earnings before interest, taxes, depreciation, and amortization (P/EBITDA) ratio. The P/EBITDA ratio is also popular because of the close relationship between a company's EBITDA and its cash flow from operations.

The P/E, P/EBIT, and P/EBITDA ratios all require positive accounting earnings. But not all companies are profitable—particularly young ones. For companies that are operating at a loss, analysts must find an alternative to accounting earnings. The most popular alternative is sales, which leads to the price-to-sales (P/Sales) ratio. The P/Sales ratio is useful in the early stages of a company's life cycle, when marketplace acceptance and growth in market share are considered to be the two best indicators of the company's likely future operating earnings and cash flows.

Another price multiple is the price-to-book (P/Book) ratio. It indicates the relative premium that investors are willing to pay over the



book value of their equity investment in a company. Unfortunately, a company's book value is highly sensitive to accounting standards and management's accounting decisions. For this reason, the P/B ratio is used selectively; realistically, it is neither a valid nor viable valuation method for most companies, except perhaps for financial institutions and insurance companies. These companies have highly liquid assets and liabilities on their balance sheets, which makes book values more realistic proxies for market values.

In contrast to the previous five multiples, the last one is based on cash flows. Because cash flows are less sensitive than earnings to accounting choices and potential accounting manipulations, some analysts prefer to base their valuation on the price-to-cash-flow (P/CF) ratio than on the P/E, P/EBIT, or even P/EBITDA ratios.<sup>10</sup> This approach is also consistent with the viewpoint that value is primarily driven by cash flows.

### 5.1.2 Enterprise Value Multiples

Price multiples are popular with buy-side and sell-side analysts interested in valuing a company's price per share—that is, the company's equity value per share.<sup>11</sup> In the context of M&As, however, corporate executives and analysts are often interested in assessing a target's total value, reflecting both debt and equity. In this case, the enterprise value is a better basis for the valuation, hence the reason enterprise value multiples are widely used when valuing an acquisition target.

The most popular enterprise value multiple is the EV/EBITDA multiple, although the EV/Sales multiple can be used for unprofitable companies. For example, an EV/EBITDA multiple of 8 indicates that the acquirer is willing to pay eight times the target's current or future EBITDA. Many analysts often check that the EV/EBITDA multiple offered to acquire a target is in line with the EV/EBITDA multiples paid in previous acquisitions. Offering an EV/EBITDA multiple that is substantially higher than the average EV/EBITDA multiple for comparable transactions is usually an indication that the acquirer is overpaying for the target.

## 5.2 Direct Valuation Methods

Unlike the relative valuation methods, direct valuation methods give investors an explicit equity value per share or share price objective. Preeminent among the group of direct valuation methods are the discounted cash flow (DCF) models.

### 5.2.1 *Discounted Cash Flow Models*

DCF models are premised on one of the most fundamental tenets of corporate finance: The value of a company today is equal to the present value of the future (but uncertain) cash flows to be generated by the company's operations, discounted at a rate that reflects the riskiness (or uncertainty) of those cash flows.

The most widely used version of the DCF model is sometimes referred to as the **free cash flow to the firm model**, or weighted average cost of capital model. It provides an estimation of the company's total value, based on its free cash flows (FCFs) to the firm discounted at the weighted average cost of capital (WACC). The FCFs of the firm are the cash flows from operations available to all capital providers, net of the required capital investments necessary to maintain the company as a going concern. The WACC reflects the hurdle rate that providers of capital require, based on the risk they face from investing in the company. The equity value per share—that is, the value accruing to the common (or voting) shareholders—is given by the operating value of the company minus the value of any claims on the company's cash flows by debt holders, preferred shareholders, noncontrolling (minority) interest shareholders, and any contingent claimants.

A variant is the **free cash flow to equity model**, which provides a direct estimate of a company's equity value per share. Instead of relying on the FCFs available to all capital providers, it considers the FCFs available to equity holders: the FCFs to the firm minus all the cash flows owed to claimants other than common shareholders. Because the focus is on equity holders, the discount rate is the cost of equity, or the hurdle rate for common shareholders.

The FCF to the firm and FCF to equity models are highly effective valuation methods, particularly when the capital structure of a target is expected to remain stable over time. Some acquisitions, however, are predicated on material changes in capital structure, as in the case of an LBO. In these situations, the **adjusted present value (APV) model** is easier to implement than the other DCF models. Under the APV model, the value of a target is decomposed into two components: the value of the company assuming that it is financed entirely with equity, and the value of the tax shield (benefits) provided by a company's actual (or expected) debt financing. Because interest is tax deductible, using financial leverage increases a company's value by reducing its cash outflow for income taxes. As a company's capital structure changes over time, the first component (the unleveraged, or unlevered, value) is unaffected; the change in financial leverage affects only the second component (the interest tax shield), which is relatively straightforward to estimate.

### 5.2.2 *Non Discounted Cash Flow Models*

**Real option analysis** is another valuation method that relies on cash flows, although it is grounded in option-pricing models instead of DCF models. Analysts rarely use real option analysis to value an entire company. However, this valuation method proves useful when a company has investment opportunities that have option-like features; these features are usually difficult, if not impossible, to capture using DCF models. For example, a company might have rights (but not obligations) to delay investments, expand into new markets, redeploy resources between projects, or exit investments. These rights are valuable options, particularly in an uncertain environment. Real option analysis, which applies to real assets some of the techniques used for valuing financial options, enables analysts to value the wide range of rights a company has.

**Economic income models**, also called **residual income models**, differ from DCF models and real option analysis, in that they rely not on cash flows, but on earnings to estimate a company's fundamental value. However, in contrast with price and enterprise value multiples that are based on accounting earnings, economic income models rely on economic income. **Economic income** is

usually defined as net income minus a charge for using equity—one of the issues with accounting earnings such as net income is that they include a charge for using debt (interest expense), but not for using equity. The principle behind economic income models is that a company that produces positive economic income creates shareholder value. Consequently, it should be rewarded with a higher share price. The most popular economic income model is economic value analysis, although other versions are also available.

Academicians agree that, in theory, the FCF to the firm, FCF to equity, APV, and economic income models are equivalent, provided, of course, that the models use the same assumptions. In practice, however, differences arise, primarily because of implementation issues. Thus, as we review the different valuation methods in Chapters 3, “Traditional Valuation Methods,” and 4, “Alternative Valuation Methods,” we address the major issues an analyst faces when using relative and direct valuation methods.

### 5.3 The Use of Valuation Methods

Imam, Barker, and Clubb (2008) conducted semi-structured interviews with sell-side and buy-side analysts in the United Kingdom to determine which valuation methods analysts used, why they used them, and how they used them. Their results showed that

- The two most widely used valuation methods are the P/E ratio and the FCF to the firm model. In contrast, few analysts used economic value analysis, multiples based on book values (whether price or enterprise value multiples), or the P/Sales ratio.<sup>12</sup>
- Approximately 60 percent of the analysts expressed a strong preference for cash flow–based valuation methods, particularly buy-side analysts. However, most analysts admit that they often complement their cash flow–based analysis with a multiples-based analysis.
- Some valuation methods are sector specific. For example, the P/B ratio and EV/Sales ratios are rarely used, except to value financial institutions and retailers, respectively.

The results of this survey are consistent with our own experience. This is the reason we have classified the FCF to the firm model and the P/E ratio as “traditional” valuation methods in this book, and we cover them both thoroughly in Chapter 3. Although other valuation methods are less often used, they are part of the analyst toolbox. Thus, we also discuss these “alternative” methods in Chapter 4, albeit less thoroughly.

## Summary

In this chapter, we considered the principal reasons companies merge or acquire one another, whether M&As create shareholder value, the size and reasoning behind the presence of premiums, and the typical steps in a merger or an acquisition. We also gave an overview of the mainstream valuation methods.

As mentioned, a sound valuation process starts with a thorough analysis of a company’s historical and forecasted performance. In Chapter 2, “Financial Review and Pro Forma Analysis,” we take a closer look at the important processes of financial review and pro forma analysis. In Chapters 3 and 4, we examine traditional and alternative valuation methods, respectively. In Chapter 5, “Accounting Dilemmas in Valuation Analysis,” we discuss a number of accounting dilemmas that analysts face when valuing companies. In Chapter 6, “Financial Reporting and Tax Considerations for Mergers and Acquisitions,” we investigate the financial reporting and tax considerations associated with M&As. In Chapter 7, “Some Final Thoughts,” we bring closure to the journey.

## Endnotes

1. Berger and Ofek (1995) were the first researchers to quantify the conglomerate discount. They showed that the average conglomerate discount is 13 to 15 percent. Although subsequent research has questioned whether the conglomerate discount is attributable to diversification only or is driven by other factors, conglomerates fell out

of favor in the 1980s, and many companies have been refocusing on their core activities since.

2. Credit rating agencies such as Moody's Investors Service, Standard & Poor's, and Fitch Ratings assign credit ratings to debt issuances. Corporate debt that is rated Baa3 or higher by Moody's and BBB- or higher by Standard & Poors' and Fitch is considered investment grade. Debt rated below these levels is considered non-investment grade and is also called high yield, speculative, or junk.
3. *Leverage* refers to financial leverage, or the amount of debt relative to equity in a company's capital structure. LBOs and leveraged recapitalizations are transactions that increase a company's financial leverage. An LBO is an acquisition in which the acquirer uses a high proportion of debt relative to equity to purchase the shares of the target. After the transaction, the target's cash flows are used to pay down the debt. A leveraged recapitalization does not involve a change in control. The company borrows money to repurchase (buy back) shares and then uses its cash flows to pay down the debt.
4. Debt is typically less expensive than equity, for two main reasons. First, the risk associated with investing in a company's debt securities is lower than the risk of investing in the same company's equity securities because debt ranks higher than equity in the event of default. To compensate for the additional risk, equity holders require a higher return than debt holders. In addition, in most cases, interest payments on debt are tax deductible, whereas dividend payments on equity are not. The lower risk and beneficial tax treatment of debt versus equity make the former a less expensive source of financing than the latter.
5. The agency theory shows that the separation between ownership and management creates potential agency conflicts between managers (agents) and shareholders (principals). In theory, agents should act in the principals' interest. In practice, this is not always the case.
6. Amihud and Lev (1981) were the first researchers to point out that investors can diversify their financial capital, but managers cannot diversify their human capital. Thus, managers sometimes engage in M&As to reduce the company's riskiness, increase its likelihood of survival, and, consequently, protect their employment, even if the transaction does not create shareholder value.
7. We owe the hubris hypothesis to Roll (1986).
8. For a comprehensive review of the literature about the performance of M&As and the factors affecting this performance, see Bruner

(2004) or Martynova and Renneboog (2008, 2011). In their most recent article, Martynova and Renneboog list the factors that have been shown to affect the share price performance of acquirers around the announcement of a merger or an acquisition. These factors include the following:

- The characteristics of the transaction, such as its timing (before versus after the peak of a M&A wave), its geographical scope (domestic versus cross-border), the type of acquisition (full versus partial), the legal status of the target (public versus privately held), the form of and attitude toward the transaction (friendly versus hostile), and the means of payment (all cash, versus all securities, versus mix of cash and securities).
  - The characteristics of the acquirer, such as its size, past operating and share price performance, cash flows, and financial leverage.
  - The relationship between the acquirer and the target, such as the industry relatedness between the two companies, the relative size of the target compared to the acquirer, and the acquirer's toehold in the target before the transaction.
  - The legal environment (common versus civil law), corporate governance regime (market based versus block holder based), and ownership structure (concentrated versus dispersed).
9. For a comprehensive analysis of the M&A process, see Bruner (2004).
  10. However, do not assume that cash flows cannot be manipulated. For example, Mulford and Comiskey (2005) identify a number of choices a company has regarding the classification of cash flows among the operating, investing, and financing sections. Companies that engage in accounting manipulation often overstate their cash flow from operating activities, which is viewed as the principal driver of a company's value and share price.
  11. Analysts are referred to as sell side or buy side depending on the type of firm for which they work. Sell-side analysts typically work for firms that sell securities and investment services, such as brokerage firms. In contrast, buy-side analysts work for asset- or investment-management firms.
  12. Imam, et al. (2008) did not include the APV model and real option analysis in their study.

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