CHAPTER 1

Two Frameworks for Understanding Valuation Models

Benton E. Gup
Chair of Banking University of Alabama

There is a saying that if you don't know what to look for, you are not going to see it. That is especially true for readers of this book who have a limited background in finance and investments. This chapter provides two concepts that will help put the valuation models and concepts presented in this book in context. The two concepts are top-down/bottom-up analysis and the life cycle.[1]

TOP-DOWN/BOTTOM-UP ANALYSIS

The traditional approach to analyzing investments is commonly called *fundamental analysis*. That approach is represented in Exhibit 1.1 as the *top-down analysis* of securities. The basic idea of top-down analysis is to start with a company, such as Microsoft, and then examine the major factors that affect the firm now and are likely to affect it in the future. This includes but is not limited to information about the economic outlook, legislation that may affect the company, industry information, demographics, and other factors that may be important when estimating a firm's growth potential. Then analyze the firm and determine its intrinsic value. *Intrinsic value* is the theoretical value of a security, and it may differ from the market price. The simplified *dividend valuation model* is one method of determining intrinsic value, and it is shown here in equation (1.1). The equation states that the price of a stock is equal to expected dividends discounted by the rate of return required by investors.

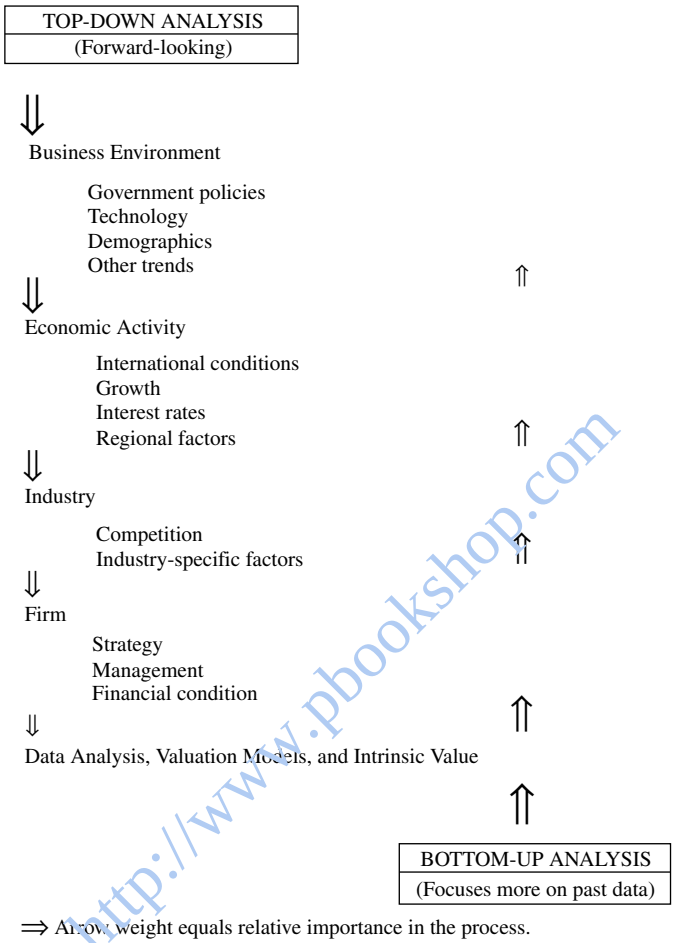

EXHIBIT 1.1 Top-Down/Bottom-Up Analysis

Because the model is simplified, it applies only to firms that pay cash dividends, and it covers only one time period. Thus, the model is shown here for purposes of illustration, and it is not known for its accuracy. Nevertheless, the model is useful in explaining fundamental analysis. For example, an increasing demand for a firm's products may lead to higher revenues and higher dividends. From the equation, it can be seen that higher dividends result in higher stock prices. Therefore, when considering the fundamental factors that are about to be discussed, think about

how they affect a firm's future revenues, its dividends, and the returns required by investors.

$$P_0 = \frac{D_1}{k - g} \tag{1.1}$$

where P_0 = current price (at time 0)
D_1 = cash dividend in time period 1
k = the rate of return required by equity investors
g = growth rate of cash dividends

Top-down analysis works well when analyzing a small number of firms. We examine top-down analysis first so that you understand the various factors affecting intrinsic value. Then we are going to reverse the process and do bottom-up analysis, which is more suitable for investors making extensive use of databases containing many firms' financial data.

Major Factors Affecting Firms Are Beyond Their Control

An important insight from top-down analysis is that the major factors affecting firms are beyond their control. The major factors affecting the demand for firms' products and services include but are not limited to the business environment, economic activity, industry factors, and other factors such as global warming.

Business Environment *Government policies*, such as defense spending, environmental controls, and Medicare, will benefit some firms and harm others. By way of illustration, since federal spending is a limited dollar amount, an increase in spending on submarines will help defense contractors. But what is spent on submarines cannot be spent on Medicare.

Changes in *technology*, such as the development of the Internet and wireless communications, are driving the growth of telecommunications, creating new opportunities for e-commerce and new ways to invest funds.

Think about the industries affected by changes in *demographics*—the aging population, increased immigration, and more females in the labor force. These changes affect health care, housing, retailers, and many other industries.

Economic Activity The states' domestic and international economic activity affects the demand for firms' products and subsequently their revenues. If the economy is strong and growing, firms tend to prosper. When it falters,

companies fail. By way of illustration, in 2008, the high costs of fuel caused some airlines to go bankrupt.

Some products such as automobiles, clothing, and television sets that were traditionally made by U.S. firms are increasingly being imported, reflecting an increase in globalization. A related factor is that an increasing number of foreign companies are investing in U.S. firms. For example, India's Sterlite Industries bought the assets of Tucson-based copper miner Asarco; and France's Vivendi will acquire American video game maker Activision.

Changes in Federal Reserve interest rate policies have both short-run and long-run macroeconomic effects. We know from the dividend valuation model shown in equation (1.1) that in the short term an increase in interest rates will adversely affect stock prices. In the long term, it may reduce the demand for a firm's products, which would adversely affect its earnings, dividends, and stock price.

While the discussion has focused on global and macroeconomic changes, some companies are strictly regional. By way of illustration, small and medium-size banks tend to serve local markets. Thus, the floods in Iowa in June 2008 affected local banks, but not banks in California or Florida. Similarly, Hurricane Katrina adversely affected markets in New Orleans, but not markets in Chicago or New York.

Industry It is important to understand the economic structure of industries before investing in them. One type of economic structure is *pure competition*, with many firms competing and no single firm able to influence the prices. Wheat farming is a classic example of pure competition because no one farmer can influence the price of this standardized commodity. Also consider the restaurant industry. There are more than 504,000 eating and drinking places in the United States.[2] That is about one eating and drinking place for every 558 people, so it is a very competitive market.[3] Nevertheless, some firms such as McDonald's and Starbucks are able to differentiate their products.

Imperfect competition prevails in markets where various firms try to convince you that their products are better than those of competitors. The differences can be real or imagined. The dozens of brands of beer, cereal, shampoo, and toothpaste to choose from are examples of imperfect competition.

Next, there are *oligopolies* where a few large firms dominate a market. Oligopolies tend to be capital intensive, which means that large dollar amounts are required to produce products such as cars, jet engines, and steel. The high costs of entry and the complexity of production tend to restrict the number of firms in such industries.

Finally, there are *monopolies* where one firm controls the market. Local public utilities, such a power companies, have near monopoly power. Because they are government regulated, their monopoly does not guarantee them excess profits. Also consider the pharmaceutical industry. It consists

of a small number of large companies, in part because it costs so much to develop new prescription drugs. The developmental costs of a new drug may exceed $1 billion, and the process may take five years or longer. Once a drug is developed and approved by the government for general use, the pharmaceutical company holding a patent on it has a monopoly on that drug for 17 or more years. That may result in large profits, or profits may be short-lived because other companies can make competing products. Monopolies don't guarantee profits.

Bottom-Up Approaches

The top-down approach works fine when analyzing a small number of companies. However, today there are thousands of companies that can be analyzed in U.S. and foreign markets. The top-down approach is too time-consuming when dealing with large numbers of companies. Because of the availability of large databases containing financial and other corporate information, high-speed computers, and improved quantitative techniques, many analysts today begin by analyzing the financial data for a large number of companies. Then they make projections about the future prospects of selected firms. Some of these bottom-up techniques are discussed in the other chapters of this book.

Implications

Grow or Die What are the implications of the factors that we have discussed? First, *grow or die.* Everybody wants firms to grow and be more profitable. The chief executive officer of a firm wants it to make more money so that he or she can get a raise. The employees want higher salaries. The shareholders want their stock to appreciate and to receive higher dividends. The community and state where the firm is located want more tax revenue and want the firm to support community activities.

Firms must grow and respond to changes in the market or they will go out of business as competitors take over their markets. A firm can make an excellent product, be profitable in the short run, and then be driven out of business because its customers' preferences shift over time. Consider how covered wagons were replaced by cars, trains, and planes. Typewriters have been largely replaced by computers, and coin-operated telephone booths by wireless phones.

Limited Control Second, firms are limited as to what they can control. They cannot control the factors in the business environment or economic activity that were previously discussed. These are some of the most important factors driving the demand for their products and services, and subsequently their revenues.

They can control their assets (what they own) and their liabilities (what they owe), and can make management decisions (expansion, diversification, marketing, corporate structure, etc.). But such control in and of itself does not guarantee success. To paraphrase Charles Darwin, only the fittest firms will survive.

One key to survival and growth is to have a sustainable competitive advantage over other firms. A *sustainable competitive advantage* can take many different forms: Coca-Cola's and McDonald's *brand names* are a sustainable competitive advantage. Microsoft's *market power* is a sustainable competitive advantage. Wal-Mart's *size and distribution system* give it an advantage. *Patents* provide a competitive advantage.

A sustainable competitive advantage is something that is not easily copied by other firms. But it is not going to last forever. Oldsmobile was a great brand name for many years, but cars are no longer manufactured under that name. Montgomery Ward and W.T. Grant were two of the leading department stores in the United States; now they are out of business. Polaroid had a monopoly on instant photographs, but its competitive advantage ended with the development of one-hour film processing and the growth of digital photography.

The lesson to be learned is that having a well-managed, profitable firm is a necessary, but not sufficient, condition for survival. Markets are dynamic, and firms must respond effectively and evolve if they are to survive.

LIFE CYCLE

Understanding the life cycle provides unique insights into corporate growth, survival, and financial behavior. All products, firms, and industries evolve through stages of development called a *life cycle*. Exhibit 1.2 illustrates a typical industry life cycle that is divided into four phases: pioneering, expansion, stabilization, and decline.

Pioneering Phase

We begin with a single firm that has one new product line that either will be successful or it will fail. The price of the new product is high, and there are no profits in this phase of the life cycle because of low sales volume and high development and marketing costs. Because there are no profits, there are no dividends to be paid.

The risk to the firm, as measured by beta, is also high. *Beta* is a measure of systematic risk and volatility. *Systematic risk* is risk that is common to all stocks, and it cannot be eliminated by diversification. The average beta for all stocks is 1. A beta of 1.8 is considered high, and a beta of 0.5 is low. Betas tend to high during the pioneering phase and then diminish as the firms mature.

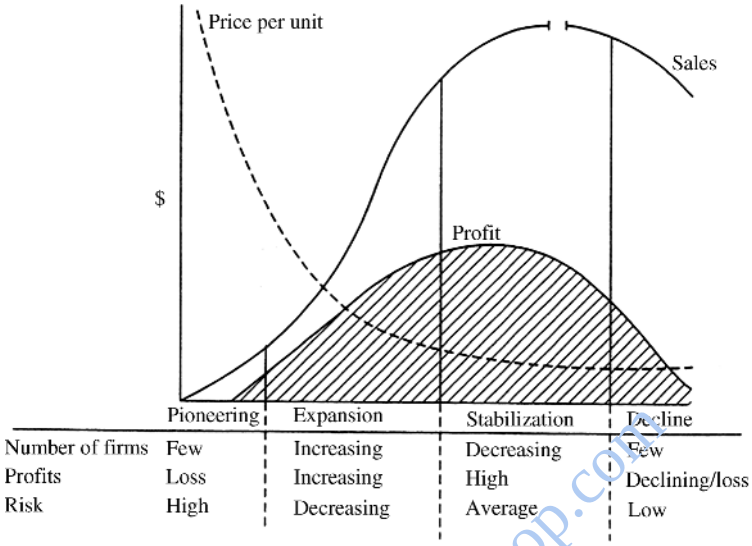

EXHIBIT 1.2 Life Cycle

Expansion Phase

The expansion phase of the life cycle is characterized by increasing competition, declining product prices, and rising industry profits. If the product is successful, other firms enter the market and competition drives the price of the product down. For example, the first wireless telephones cost $4,200 each when they were introduced in 1984, and now they are given away when you buy telephone service contracts.[4] Similarly, handheld calculators cost $120 when they were introduced in 1970, and now they, too, are given away. The point here is that the price of a commodity-type product tends to decline as a result of competition and changes in technology.

As shown in Exhibit 1.2, sales revenues are increasing, but at a decreasing rate. Industry profits are increasing as well, and beta is high, but not as high as it was during the pioneering phase. As profits rise, the firms begin to pay cash dividends.

The expansion phase is a period of spectacular successes and spectacular failures. Only the fittest firms survive. By way of illustration, consider the automobile industry. During the expansion phase of the life cycle, there were about 1,500 automobile companies in the United States.[5] Today, only Ford, General Motors, and Chrysler remain, and several foreign-owned companies are producing cars in the United States. The prices of the mass-produced cars are relatively low in real terms. The survivors dominate the industry in terms of total revenues.

Stabilization Phase

During the stabilization phase of the life cycle, total sales continue to rise, but at a slower pace, while prices decline and industry profits in real terms, though high, begin to fall. The number of firms continues to decline, and the *dividend payout ratio* (cash dividends/earnings) increases. Beta is about 1.

The surviving firms have the following four characteristics:

1. Sufficient *capital* to finance their operations.
2. Sufficient *technology* to produce a continuous stream of new products.
3. Sufficient *scale* or size so that the products can be mass-produced at the lowest possible cost.
4. Sufficient *marketing and distribution channels* to sell, service, and finance their products.

One way for successful companies to grow is by acquiring other companies. The acquisitions usually occur during the later part of the expansion phase or in the stabilization phase. For example, Cisco Systems and General Electric have acquired large numbers of smaller, faster-growing companies. Strategic alliances are another avenue for expansion. For example, Citigroup and Nikko Cordial formed an alliance in order to create one of Japan's leading financial services groups and to enable the combined franchise to pursue important new growth opportunities.[6] Strategic alliances are sometimes used as precursors to acquisitions.

Another aspect of firms in the stabilization phase of the life cycle is that they introduce new products to extend the duration of that phase. Consider the case of McDonald's Corporation, which was the innovator of fast-food restaurants. Its first product was a hamburger. As shown in Exhibit 1.3, when the growth rate of sales of hamburgers slowed, McDonald's introduced the Big Mac. When the growth rate of Big Mac sales slowed, the company introduced Egg McMuffin, Chicken McNuggets, and other new products, and began to enter new markets such as Europe and Asia to increase revenues. The point here is that even major brands, such as McDonald's, must be reinvigorated with new products and services if they are to survive. However, not every new product is going to be a success. For example, deep-fried zucchini was a loser.

Declining Phase

The declining phase of the life cycle is similar to old age in human beings. The firm or industry is over the hill and on the way out. However, there is one significant difference between humans and firms or industries. Once humans have matured, it is unlikely that they can be rejuvenated and be young again, but *rejuvenation* is possible with industries. For example,

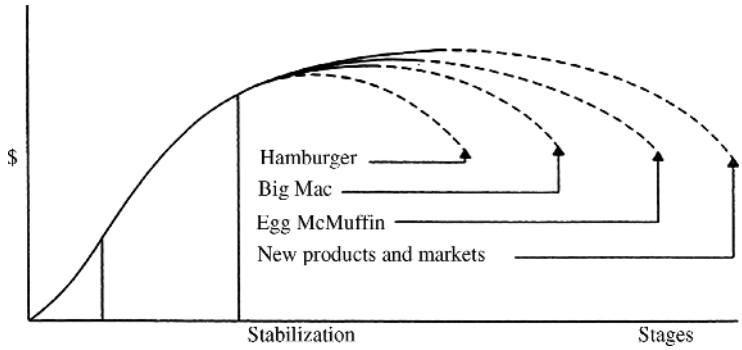

EXHIBIT 1.3 Extending the Life Cycle of McDonald's

higher energy costs have contributed to the rejuvenation of the coal industry. Similarly, ceiling fans were a common means of cooling homes before central air-conditioning became widespread. Then they went out of style. But when energy prices soared in the late 1970s and early 1980s, people sought ways to reduce their energy costs and once again turned to ceiling fans. Note that an external economic factor—higher energy prices—is the force that is driving the demand for coal and ceiling fans.

Similarly, high oil prices in 2008 increased the demand for hybrid vehicles. The use of ethanol in gasoline drove up the price of corn, and subsequently the price of food. Thus, *external factors*, such as the cost of energy, oil, and corn, have had a major impact on the demand for selected products and the companies that produce them.

FIRMS

At the firm level, we need to understand their strategies and current developments. Many firms have web sites that provide access to their annual reports, Securities and Exchange Commission (SEC) filings, press releases, news stories, and current research reports. Firms also provide financial guidance. These forward-looking statements include projections about the expected growth rates, sales forecasts, and other specified financial items. A word of caution is in order. No forward-looking statement can be guaranteed, and actual results may differ materially from those projected. Despite these limitations, such information is required reading, and is particularly useful in monitoring investments.

By way of illustration, Merck & Co., Inc. explains its strategy in its annual report, which is available online.[7] Simply stated, research and

development (R&D) is the key to Merck's success. Other companies may or may not be as explicit about their strategies. Merck's strategy is to discover important new medicines through breakthrough research. Furthermore, its financial goal is to be a top-tier growth company by performing over the long term in the top quartile of leading health care companies.

We also need to understand the financial condition of the firm, with particular emphasis on profitability, financial leverage, and other factors that are beyond the scope of this chapter.

Finally, we use all of the information obtained in various valuation models that are explained in the other chapters of this book. The valuation models are used to determine the firm's intrinsic value.

CONCLUSION

Traditional security analysis begins with a particular company in mind. The top-down approach then examines the major factors influencing the demand for that firm's products and services. Those factors include the business environment, economic activity, and industry factors including the life cycle. These are factors over which the firm has no control, but they can make or break the firm. Then the firm itself is analyzed. This technique is suitable when analyzing a small number of companies. However, the bottom-up approach is better when evaluating a large number of companies. The bottom-up approach takes advantage of large databases and quantitative techniques to estimate intrinsic values.

NOTES

1. For additional information on the life cycles, see Benton E. Gup, *Investing Online* (Malden, MA: Blackwell Publishing Ltd., 2003).
2. U.S. Bureau of the Census, NAICS 722110, www.census.gov/econ/census02/data/industry/E722110.HTM. Data are for 2002.
3. Data are from the U.S. Bureau of Census, U.S. Census 2000, www.census.gov/main/www/cen2000.html.
4. Juan Enriquez, *As the Future Catches You: How Genomics & Other Forces Are Changing Your Life, Work, Health & Wealth* (New York: Crown, 2001).
5. Donald L. Kemmerer and C. Clyde Jones, *American Economic History* (New York: McGraw-Hill, 1959), 325.
6. "Citigroup and Nikko Cordial Agree on Comprehensive Strategic Alliance," Citigroup press release, March 6, 2007.
7. www.merck.com/finance/annualreport/ar2007/pipeline.html.