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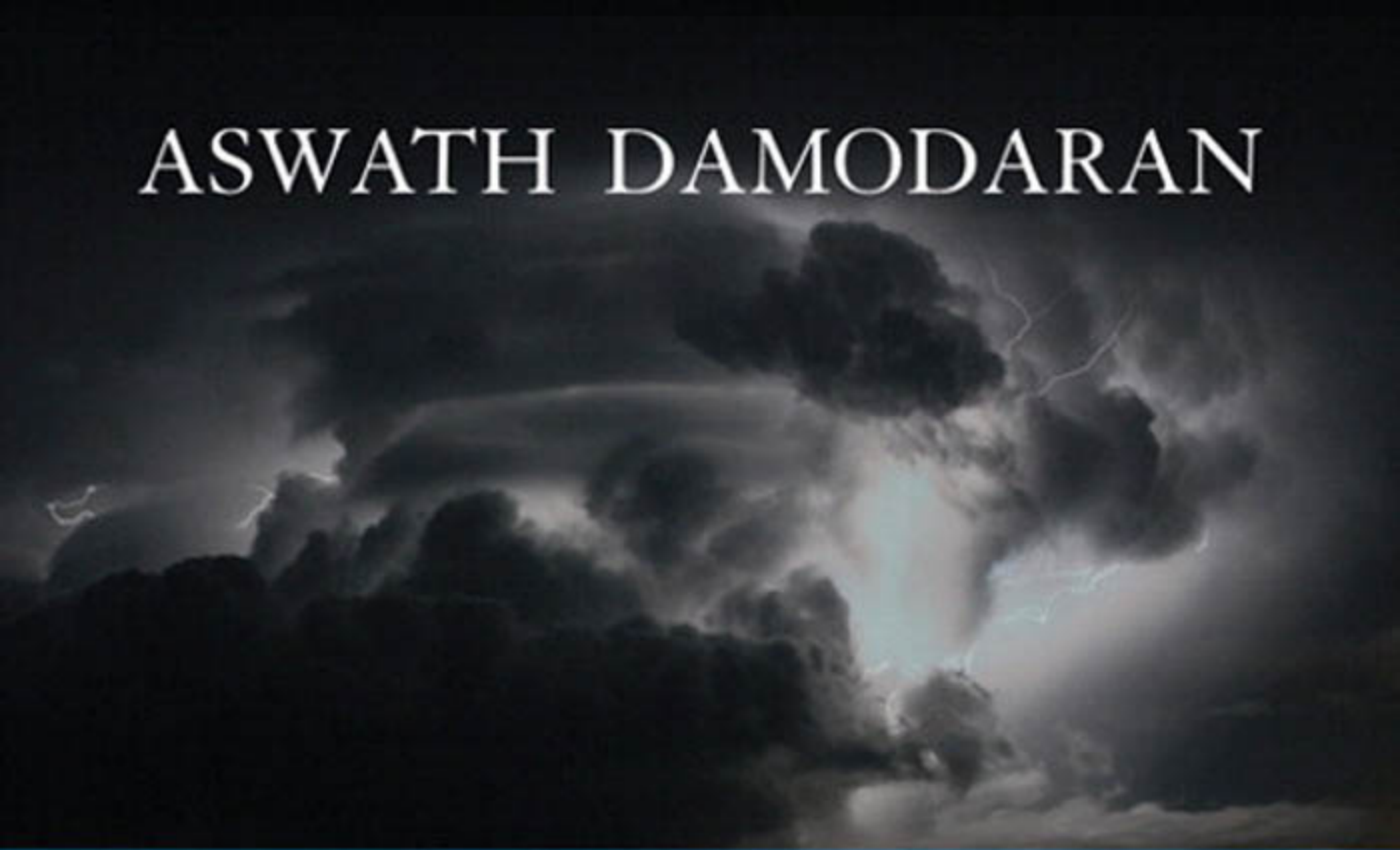

THE DARK SIDE OF VALUATION

SECOND EDITION

VALUING YOUNG, DISTRESSED, AND COMPLEX BUSINESSES

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PREFACE

The Dark Side of Valuation, Second Edition

The first edition of this book is showing its age and origins. The idea for the first edition of *The Dark Side of Valuation* was born at the end of 1999, toward the end of the dot-com boom. It was triggered by two phenomena:

- The seeming inability of traditional valuation models to explain stratospheric stock prices for technology (especially new technology) companies
- The willingness of analysts to abandon traditional valuation metrics and go over to the "dark side" of valuation, where prices were justified using a mix of new metrics and storytelling

The publication of the first edition coincided with the bursting of that bubble.

As markets have evolved and changed, the focus has shifted. The bubble and the concurrent rationalization using new paradigms and models have shifted to new groups of stocks (Chinese and Indian equities) and new classes of assets (subprime mortgages). I have come to the realization that the dark side of valuation beckons any time analysts have trouble fitting companies into traditional models and metrics. This second edition reflects that broader perspective. Rather than focusing on just young, high-tech (Internet) companies, as I did in the first edition, I want to look at companies that are difficult to value across the spectrum.

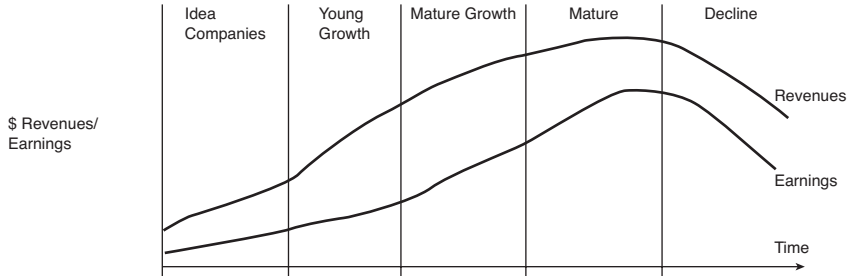
Chapters 2 through 5 review the basic tools available in valuation. In particular, they summarize conventional discounted cash flow models, probabilistic models (simulations, decision trees), relative valuation models, and real options. Much of what is included in this part has already been said in my other books on valuation.

Chapters 6 through 8 examine some of the estimation questions and issues surrounding macro variables that affect all valuation. Chapter 6 looks at the risk-free rate, the building block for all other inputs, and challenges the notion that government bond rates are always good estimates of risk-free rates. Chapter 7 expands the discussion to look at equity risk premiums. This is another number that is often taken as a given in valuation, primarily because risk premiums in mature markets have been stable for long periods. In shifting and volatile markets, risk premiums can change significantly over short periods. Failing to recognize this reality will create skewed valuations. Chapter 8 examines

other macroeconomic assumptions that are often implicit in valuations about growth in the real economy. It also looks at exchange rates and inflation and how inconsistencies in these valuations affect the conclusions we draw.

Chapters 9 through 12 look at valuation challenges across a firm's life cycle. Figure P.1 shows the challenges.

A Life Cycle of Valuation



Valuation Players/Setting	Owners Angel Finance	Venture Capitalists IPO	Growth Investors Equity Analysts	Value Investors Private Equity Funds	Vulture Investors Break-Up Valuations
Revenue/Earnings	1. What is the potential market? 2. Will this product sell and at what price? 3. What are the expected margins?	1. Can the company scale up? (How will revenue growth change as firm gets larger?) 2. How will competition affect margins?	1. As growth declines, how will the firm's reinvestment policy change? 2. Will financing policy change as firm matures?	1. Is there the possibility of the firm being restructured?	Low, as projects dry up.
Survival Issues	Will the firm make it?	Will the firm be acquired?		Will the firm be taken private?	Will the firm be liquidated/go bankrupt?
Key Valuation Inputs	Potential Market Margins Capital Investment Key Person Value?	Revenue Growth Target Margins	Return on Capital Reinvestment Rate Length of Growth	Current Earnings Efficiency Growth Changing Cost of Capital	Asset Divestiture Liquidation Values
Data Issues	No History No Financials	Low Revenues Negative Earnings Changing Margins	Past data reflects smaller company.	Numbers can change if management changes.	Declining Revenues Negative Earnings?

Figure P.1: A Life Cycle View of Valuation

Chapter 9 reviews the challenges faced in valuing young and "idea" businesses, which have an interesting idea for a product or service but no tangible commercial product yet. It also considers the baby steps involved as the idea evolves into a commercial product, albeit with very limited revenues and evidence of market success. Thus, it looks at the challenges faced in the first stages of entrepreneurial valuation. These are the challenges that venture capitalists have faced for decades when providing "angel financing" to small companies. Chapter 10 climbs the life cycle ladder to look at young growth companies, whose products and services have found a market and where revenues are growing fast. This chapter also examines the valuation implications of going public as opposed to staying private and the sustainability of growth. In addition, this chapter looks at growth companies that have survived the venture capital cycle and have gone

public. These companies have a well-established track record of growth, but their size is working against them. Chapter 11 looks at "mature companies," where growth is in the past, and the efforts made by these firms to increase value, including acquisitions, operating restructuring, and financial restructuring. In the process, we also consider how a private equity investor may view value in a "mature" company in the context of a leveraged buyout and the value of control in this company. Chapter 12 considers firms in decline, where growth can be negative, and the potential for distress and bankruptcy may be substantial.

Chapters 13 through 17 look at specific types of firms that have proven difficult to value for a variety of reasons. Chapter 13 looks at two broad classes of firms—commodity companies (oil, gold) and cyclical companies, where volatile earnings driven by external factors (commodity prices, state of the economy) make projections difficult. The special challenges associated with financial services firms—banks, insurance companies, and investment banks—are examined in Chapter 14, with an emphasis on how regulatory changes can affect value. Chapter 15 looks at companies that are heavily dependent on intangible assets: patents, technological prowess, and human capital. The nature of the assets in these firms, combined with flaws in the accounting standards that cover them, make them challenging from a valuation perspective. Chapter 16 looks at companies that operate in volatile and young economies (emerging markets) and how best to estimate their value. Chapter 17 looks at companies in multiple businesses that operate in many countries and how best to deal with the interactions between the different pieces within these companies.

In summary, this second edition is a broader book directed at dark practices and flawed methods in valuation across the spectrum—not just in young technology companies.

1

The Dark Side of Valuation

I have always believed that valuation is simple and that practitioners choose to make it complex. The intrinsic value of a cash flow-generation asset is a function of how long you expect it to generate cash flows, as well as how large and predictable these cash flows are. This is the principle that we use in valuing businesses, private as well as public, and in valuing securities issued by these businesses.

Although the fundamentals of valuation are straightforward, the challenges we face in valuing companies shift as firms move through the life cycle. We go from idea businesses, often privately owned, to young growth companies, either public or on the verge of going public, to mature companies, with diverse product lines and serving different markets, to companies in decline, marking time until they are liquidated. At each stage, we are called on to estimate the same inputs—cash flows, growth rates, and discount rates—but with varying amounts of information and different degrees of precision. All too often, when confronted with significant uncertainty or limited information, we are tempted by the dark side of valuation, in which first principles are abandoned, new paradigms are created, and common sense is the casualty.

This chapter begins by describing the determinants of value for any company. Then it considers the estimation issues we face at each stage in the life cycle and for different types of companies. We close the chapter by looking at manifestations of the dark side of valuation.

Foundations of Value

We will explore the details of valuation approaches in the next four chapters. But we can establish the determinants of value for any business without delving into the models themselves. In this section, we will first consider a very simple version of an intrinsic value model. Then we will use this version to list the classes of inputs that determine value in any model.

Intrinsic Valuation

Every asset has an intrinsic value. In spite of our best efforts to observe that value, all we can do, in most cases, is arrive at an estimate of value. In discounted cash flow (DCF) valuation, the intrinsic value of an asset can be written as the present value of expected cash flows over its life, discounted to reflect both the time value of money and the riskiness of the cash flows.

$$\text{Value of Asset} = \sum_{t=1}^{t=N} \frac{E(CF_t)}{(1+r)^t}$$

In this equation, $E(CF_t)$ is the expected cash flow in period t, r is the risk-adjusted discount rate for the cash flow, and N is the life of the asset.

Now consider the challenges of valuing an ongoing business or company, which, in addition to owning multiple assets, also has the potential to invest in new assets in the future. Consequently, not only do we have to value a portfolio of existing assets, but we also have to consider the value that may be added by new investments in the future. We can encapsulate the challenges by framing a financial balance sheet for an ongoing firm, as shown in Figure 1.1.

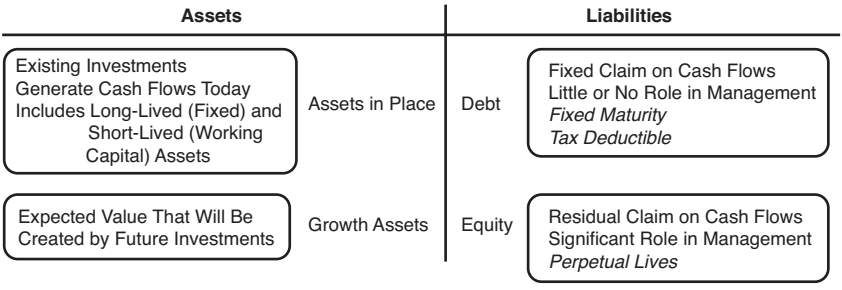


Figure 1.1: A Financial Balance Sheet

Thus, to value the company, we have to value both the investments already made (assets in place) and growth assets (investments that are expected in the future) while factoring in the mix of debt and equity used to fund the investments. A final complication must be considered. At least in theory, a business, especially if it is publicly traded, can keep generating cash flows forever, thus requiring us to expand our consideration of cash flows to cover this perpetual life:

$$\text{Value of Business} = \sum_{t=1}^{t=\infty} \frac{E(CF_t)}{(1+r)^t}$$

Because estimating cash flows forever is not feasible, we simplify the process by estimating cash flows for a finite period (N) and then a "terminal value" that captures the value of all cash flows beyond that period. In effect, the equation for firm value becomes the following:

$$\text{Value of Business} = \sum_{t=1}^{t=N} \frac{E(CF_t)}{(1+r)^t} + \frac{\text{Terminal Value}_N}{(1+r)^N}$$

Although different approaches can be used to estimate terminal value, the one most consistent with intrinsic value for a going concern is to assume that cash flows beyond year N grow at a constant rate forever, yielding the following variation on valuation:

$$\text{Value of Business} = \sum_{t=1}^{t=N} \frac{E(CF_t)}{(1+r)^t} + \frac{E(CF_{N+1})}{(r-g_n)(1+r)^N}$$

Because no firm can grow at a rate faster than the overall economy forever, this approach to estimating terminal value can be used only when the firm becomes a mature business. We will examine the details of estimating the inputs—cash flows, discount rates, and growth rates—in Chapter 2, "Intrinsic Valuation."

Determinants of Value

Without delving into the details of estimation, we can use the equation for the intrinsic value of the business to list the four broad questions that we need to answer in order to value any business:

- What are the cash flows that will be generated by the existing investments of the company?
- How much value, if any, will be added by future growth?
- How risky are the expected cash flows from both existing and growth investments, and what is the cost of funding them?
- When will the firm become a stable growth firm, allowing us to estimate a terminal value?

What Are the Cash Flows Generated by Existing Assets?

If a firm has already made significant investments, the first inputs into valuation are the cash flows from these existing assets. In practical terms, this requires estimating the following:

- How much the firm generated in earnings and cash flows from these assets in the most recent period
- How much growth (if any) is expected in these earnings/cash flows over time
- How long the assets will continue to generate cash flows

Although data that allows us to answer all these questions may be available in current financial statements, it might be inconclusive. In particular, cash flows can be difficult to obtain if the existing assets are still not fully operational (infrastructure investments that have been made but are not in full production mode) or if they are not being efficiently utilized. There can also be estimation issues when the firm in question is in a volatile business, where earnings on existing assets can rise and fall as a result of macroeconomic forces.

How Much Value Will Be Added by Future Investments (Growth)?

For some companies, the bulk of value is derived from investments you expect them to make in the future. To estimate the value added by these investments, you have to make judgments on two variables. The first is the magnitude of these new investments relative to the size of the firm. In other words, the value added can be very different if you assume that a firm reinvests 80% of its earnings into new investments than if you assume that it reinvests 20%. The second variable is the quality of the new investments measured in terms of excess returns. These are the returns the firm makes on the investments over and above the cost of funding those investments. Investing in new assets that generate returns of 15%, when the cost of capital is 10%, will add value, but investing in new assets that generate returns of 10%, with the same cost of capital, will not. In other words, it is growth with excess returns that creates value, not growth per se.

Because growth assets rest entirely on expectations and perception, we can make two statements about them. One is that valuing growth assets generally poses more challenges than valuing existing assets; historical or financial statement information is less likely to provide conclusive results. The other is that there will be far more volatility in the value of growth assets than in the value of existing assets, both over time and across different people valuing the same firm. Not only will analysts be likely to differ more on the inputs into growth asset value—the magnitude and quality of new investments—but they will also change their own estimates more over time as new information about the firm comes out. A poor earnings announcement by a growth company may alter the value of its existing assets just a little, but it can dramatically shift expectations about the value of growth assets.

How Risky Are the Cash Flows, and What Are the Consequences for Discount Rates?

Neither the cash flows from existing assets nor the cash flows from growth investments are guaranteed. When valuing these cash flows, we have to consider risk somewhere, and the discount rate is usually the vehicle that we use to convey the concerns that we may have about uncertainty in the future. In practical terms, we use higher discount rates to discount riskier cash flows and thus give them a lower value than more predictable cash flows. While this is a commonsense notion, we run into issues when putting this into practice when valuing firms:

- **Dependence on the past**: The risk that we are concerned about is entirely in the future, but our estimates of risk are usually based on data from the past—historical prices, earnings, and cash flows. While this dependence on historical data is understandable, it can give rise to problems when that data is unavailable, unreliable, or shifting.
- **Diverse risk investments**: When valuing firms, we generally estimate one discount rate for its aggregate cash flows, partly because of how we estimate risk parameters and partly for convenience. Firms generate cash flows from multiple assets, in different locations, with varying amounts of risk, so the discount rates we use should be different for each set of cash flows.
- **Changes in risk over time**: In most valuations, we estimate one discount rate and leave it unchanged over time, again partly for ease and partly because we feel uncomfortable changing discount rates over time. When valuing a firm, though, it is entirely possible, and indeed likely, that its risk will change over time as its asset mix changes and it matures. In fact, if we accept the earlier proposition that the cash flows from growth assets are more difficult to predict than cash flows from existing assets, we should expect the discount rate used on the cumulative expected cash flows of a growth firm to decrease as its growth rate declines over time.

When Will the Firm Become Mature?

The question of when a firm will become mature is relevant because it determines the length of the high-growth period and the value we attach to the firm at the end of the period (the terminal value). This question may be easy to answer for a few firms. This includes larger and more stable

firms that are either already mature businesses or close to maturity, or firms that derive their growth from a single competitive advantage with an expiration date (for instance, a patent). For most firms, however, the conclusion will be murky for two reasons:

- Making a judgment about when a firm will become mature requires us to look at the sector in which the firm operates, the state of its competitors, and what they will do in the future. For firms in sectors that are evolving, with new entrants and existing competitors exiting, this is difficult to do.
- We are sanguine about mapping pathways to the terminal value in discounted cash flow models. We generally assume that every firm makes it to stable growth and goes on. However, the real world delivers surprises along the way that may impede these paths. After all, most firms do not make it to the steady state that we aspire to and instead get acquired, are restructured, or go bankrupt well before the terminal year.

In summary, not only is estimating when a firm will become mature difficult to do, but considering whether a firm will make it as a going concern for a valuation is just as important.

Pulling together all four questions, we get a framework for valuing any business, as shown in Figure 1.2.

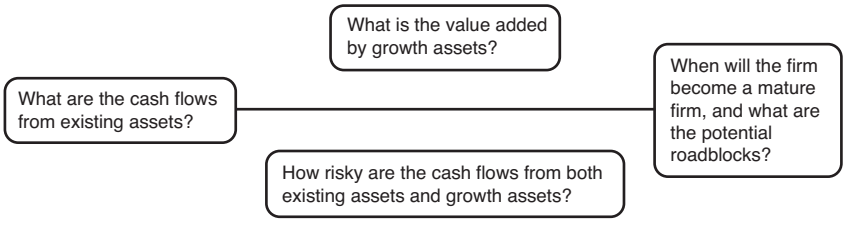


Figure 1.2: The Fundamental Questions in Valuation

Although these questions may not change as we value individual firms, the ease with which we can answer them can change. This happens not only as we look across firms at a point in time, but also across time, even for the same firm. Getting from the value of the business to the value of the equity in the business may seem like a simple exercise: subtracting the outstanding debt. But the process can be complicated if the debt is not clearly defined or is contingent on an external event (a claim in a lawsuit). Once we have the value of equity, getting the value of a unit claim in equity (per share value) can be difficult if different equity claims have different voting rights, cash flow claims, or liquidity.

Valuation Across Time

Valuing all companies becomes more complicated in an unsettled macroeconomic environment. In fact, three basic inputs into every valuation—the risk-free rate, risk premiums, and overall economic growth (real and nominal)—can be volatile in some cases, making it difficult to value any company. In this section, we will look at the reasons for volatility in these fundamental inputs and how they can affect valuations.

Interest Rates

To value a risky asset, we have to answer a fundamental question: What can you expect to earn as a rate of return on a riskless investment? The answer to this question is the risk-free rate. Although we take it as a given in most valuations, it can sometimes be difficult to identify. When the risk-free rate is unknown, everything else in the valuation is open to question as well.

To understand why estimating the risk-free rate can be problematic, let us define a risk-free rate. It is the rate of return you can expect to make on an investment with a guaranteed return. For an investment to deliver such a return, it must have no default risk, which is why we use government bond rates as risk-free rates. In addition, the notion of a risk-free rate must be tied to your time horizon as an investor. The guaranteed return for a six-month investment can be very different from the guaranteed return over the next five years.

So, what are the potential issues? The first is that, with some currencies, the governments involved either do not issue bonds in those currencies, or the bonds are not traded. This makes it impossible to get a long-term bond rate in the first place. The second issue is that not all governments are default-free, and the potential for default can inflate the rates on bonds issues by these entities, thus making the observed interest rates not risk-free. The third issue is that the riskless rate today may be (or may seem to be) abnormally high or low, relative to fundamentals or history. This leaves open the question of whether we should be locking in these rates for the long term in a valuation.

Market Risk Premiums

When valuing individual companies, we draw on market prices for risk for at least two inputs and make them part of every valuation. The first is the equity risk premium. This is the additional return that we assume investors demand for investing in risky assets (equities) as a class, relative to the risk-free rate. In practice, this number is usually obtained by looking at long periods of historical data, with the implicit assumption that future premiums will converge to this number sooner rather than later. The second input is the default spread for risky debt, an input into the cost of debt in valuation. This number is usually obtained by either looking at the spreads on corporate bonds in different ratings classes or looking at the interest rates a company is paying on the debt it has on its books right now.

In most valuations, the equity risk premium and default spread are assumed to be either known or a given. Therefore, analysts focus on company-specific inputs—cash flows, growth, and risk—to arrive at an estimate of value. Furthermore, we usually assume that the market prices for risk in both equity and debt markets remain stable over time. In emerging markets, these assumptions are difficult to sustain. Even in mature markets, we face two dangers. The first is that economic shocks can change equity risk premiums and default spreads significantly. If the risk premiums that we use to value companies do not reflect these changes, we risk undervaluing or overvaluing all companies (depending on whether risk premiums have increased or decreased). The second danger is that there are conditions, especially in volatile markets, where the equity risk premium that we estimate for the near term (the next year or two) will be different from the equity risk premium that we believe will hold in the long term (after year 5, for instance). To get realistic valuations of companies, we have to incorporate these expected changes into the estimates we use for future years.

The Macro Environment

It is impossible to value a company without making assumptions about the overall economy in which it operates. Since instability in the economy feeds into volatility in company earnings and cash flows, it is easier to value companies in mature economies, where inflation and real growth are stable. Most of the changes in company value over time, then, come from changes in company-specific inputs. We face a very different challenge when we value companies in economies that are in flux, because changes in the macroeconomic environment can dramatically change values for all companies.

In practice, three general macro economic inputs influence value. The first is the growth in the real economy. Changes in that growth rate will affect the growth rates (and values) of all companies, but the effect will be largest for cyclical companies. The second is expected inflation; as inflation becomes volatile, company values can be affected in both positive and negative ways. Companies that can pass through the higher inflation to their customers will be less affected than companies without pricing power. All companies can be affected by how accounting and tax laws deal with inflation. The third and related variable is exchange rates. When converting cash flows from one currency into another, we have to make assumptions about expected exchange rates in the future.

We face several dangers when valuing companies in volatile economies. The first is that we fail to consider expected changes in macroeconomic variables when making forecasts. Using today's exchange rate to convert cash flows in the future, from one currency to another, is an example. The second danger is that we make assumptions about changes in macroeconomic variables that are internally inconsistent. Assuming that inflation in the local currency will increase while also assuming that the currency will become stronger over time is an example. The third danger is that the assumptions we make about macroeconomic changes are inconsistent with other inputs we use in the valuation. For instance, assuming that inflation will increase over time, pushing up expected cash flows, while the risk-free rate remains unchanged, will result in an overvaluation of the company.

Valuation Across the Life Cycle

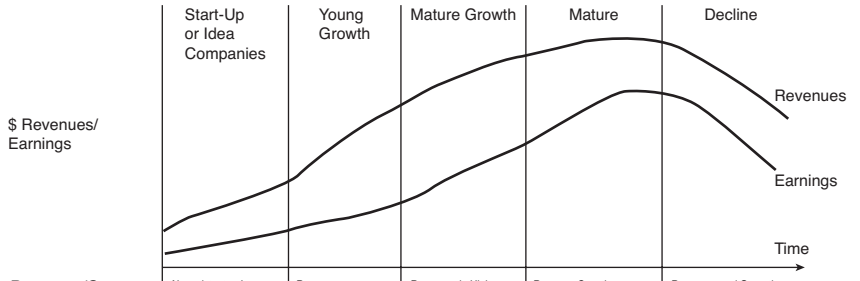
Although the inputs into valuation are the same for all businesses, the challenges we face in making the estimates can vary significantly across firms. In this section, we first break firms into four groups based on where they are in the life cycle. Then we explore the estimation issues we run into with firms in each stage.

The Business Life Cycle

Firms pass through a life cycle, starting as young idea companies, and working their way to high growth, maturity, and eventual decline. Because the difficulties associated with estimating valuation inputs vary as firms go through the life cycle, it is useful to start with the five phases that we divide the life cycle into and consider the challenges in each phase, as shown in Figure 1.3.

Note that the time spent in each phase can vary widely across firms. Some, like Google and Amazon, speed through the early phases and quickly become growth companies. Others make the adjustment much more gradually. Many growth companies have only a few years of growth before they become mature businesses. Others, such as Coca-Cola, IBM, and Wal-Mart, can

stretch their growth periods to last decades. At each phase in the cycle, some companies never make it through, either because they run out of cash and access to capital or because they have trouble making debt payments.



	Start-Up or Idea Companies	Young Growth	Mature Growth	Mature	Decline
Revenues/Current Operations	Nonexistent or Low Revenues/Negative Operating Income	Revenues Increasing/Income Still Low or Negative	Revenues in High Growth/Operating Income Also Growing	Revenue Growth Slows/Operating Income Still Growing	Revenues and Operating Income Growth Drops Off
Operating History	None	Very Limited	Some Operating History	Operating History Can Be Used in Valuation	Substantial Operating History
Comparable Firms	None	Some, but in Same Stage of Growth	More Comparable, at Different Stages	Large Number of Comparables, at Different Stages	Declining Number of Comparables, Mostly Mature
Source of Value	Entirely Future Growth	Mostly Future Growth	Portion from Existing Assets/Growth Still Dominates	More from Existing Assets Than Growth	Entirely from Existing Assets

Figure 1.3: Valuation Issues Across the Life Cycle

Early in the Life Cycle: Young Companies

Every business starts with an idea. The idea germinates in a market need that an entrepreneur sees (or thinks he sees) and a way of filling that need. Most ideas go nowhere, but some individuals take the next step of investing in the idea. The capital to finance the investment usually comes from personal funds (from savings, friends, and family), and in the best-case scenario, it yields a commercial product or service. Assuming that the product or service finds a ready market, the business usually needs to access more capital. Usually it is supplied by venture capitalists, who provide funds in return for a share of the equity in the business. Building on the most optimistic assumptions again, success for the investors in the business ultimately is manifested as a public offering to the market or sale to a larger entity.

At each stage in the process, we need estimates of value. At the idea stage, the value may never be put down on paper, but it is the potential for this value that induces the entrepreneur to invest both time and money in developing the idea. At subsequent stages of the capital-raising process, the valuations become more explicit, because they determine what the entrepreneur must give up as a share of ownership in return for external funding. At the time of the public offering, the valuation is key to determining the offering price.

Using the template for valuation that we developed in the preceding section, it is easy to see why young companies also create the most daunting challenges for valuation. There are few or no existing assets; almost all the value comes from expectations of future growth. The firm's current

financial statements provide no clues about the potential margins and returns that will be generated in the future, and little historical data can be used to develop risk measures. To cap the estimation problem, many young firms will not make it to stable growth, and estimating when that will happen for firms that survive is difficult to do. In addition, these firms are often dependent on one or a few key people for their success, so losing them can have significant effects on value. A final valuation challenge we face with valuing equity in young companies is that different equity investors have different claims on the cash flows. The investors with the first claims on the cash flows should have the more valuable claims. Figure 1.4 summarizes these valuation challenges.

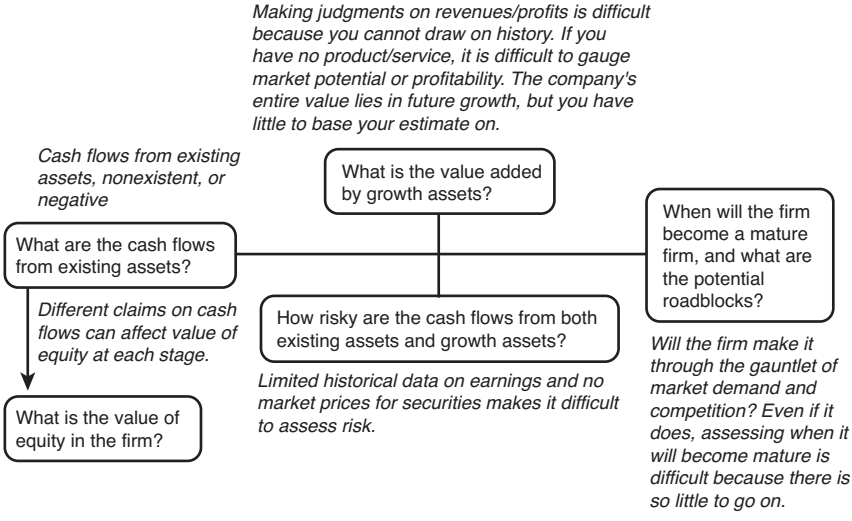


Figure 1.4: Valuation Challenges

Given these problems, it is not surprising that analysts often fall back on simplistic measures of value, "guesstimates," or rules of thumb to value young companies.

The Growth Phase: Growth Companies

Some idea companies make it through the test of competition to become young growth companies. Their products or services have found a market niche, and many of these companies make the transition to the public market, although a few remain private. Revenue growth is usually high, but the costs associated with building market share can result in losses and negative cash flows, at least early in the growth cycle. As revenue growth persists, earnings turn positive and often grow exponentially in the first few years.

Valuing young growth companies is a little easier than valuing start-up or idea companies. The markets for products and services are more clearly established, and the current financial statements provide some clues to future profitability. Five key estimation issues can still create valuation uncertainty. The first is how well the revenue growth that the company is reporting will scale up. In other words, how quickly will revenue growth decline as the firm gets bigger? The answer will differ across companies and will be a function of both the company's competitive advantages and the market it serves. The second issue is determining how profit margins will evolve over

time as revenues grow. The third issue is making reasonable assumptions about reinvestment to sustain revenue growth, with concurrent judgments about the returns on investment in the business. The fourth issue is that as revenue growth and profit margins change over time, the firm's risk will also shift, with the requirement that we estimate how risk will evolve in the future. The final issue we face when valuing equity in growth companies is valuing options that the firm may grant to employees over time and the effect that these grants have on value per share. Figure 1.5 captures the estimation issues we face in valuing growth companies.

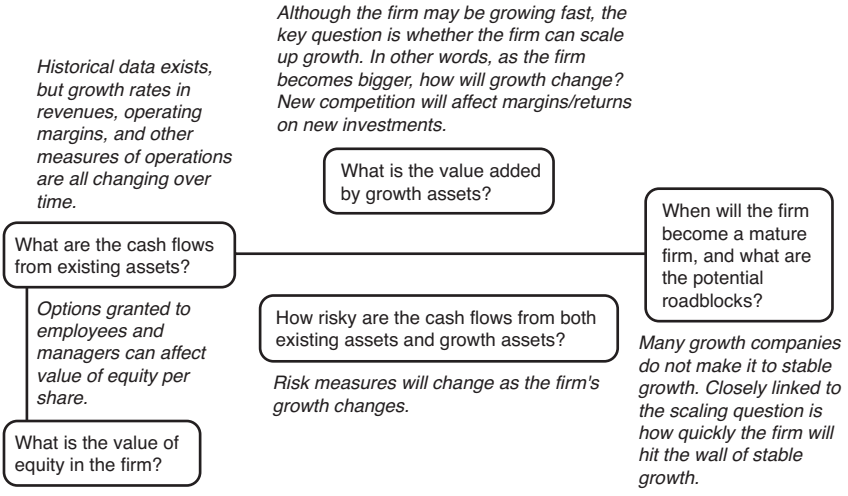


Figure 1.5: Estimation Issues in Growth Companies

As firms move through the growth cycle, from young growth to more established growth, some of these questions become easier to answer. The proportion of firm value that comes from growth assets declines as existing assets become more profitable and also accounts for a larger chunk of overall value.

Maturity—a Mixed Blessing: Mature Firms

Even the best of growth companies reach a point where size works against them. Their growth rates in revenues and earnings converge on the growth rate of the economy. In this phase, the bulk of a firm's value comes from existing investments, and financial statements become more informative. Revenue growth is steady, and profit margins have settled into a pattern, making it easier to forecast earnings and cash flows.

Although estimation does become simpler with these companies, analysts must consider potential problems. The first is that the results from operations (including revenues and earnings) reflect how well the firm is utilizing its existing assets. Changes in operating efficiency can have a large impact on earnings and cash flows, even in the near term. The second problem is that mature firms sometimes turn to acquisitions to re-create growth potential. Predicting the magnitude and consequences of acquisitions is much more difficult to do than estimating growth

from organic or internal investments. The third problem is that mature firms are more likely to look to financial restructuring to increase their value. The mix of debt and equity used to fund the business may change overnight, and assets (such as accounts receivable) may be securitized. The final issue is that mature companies sometimes have equity claims with differences in voting right and control claims, and hence different values. Figure 1.6 frames the estimation challenges at mature companies.

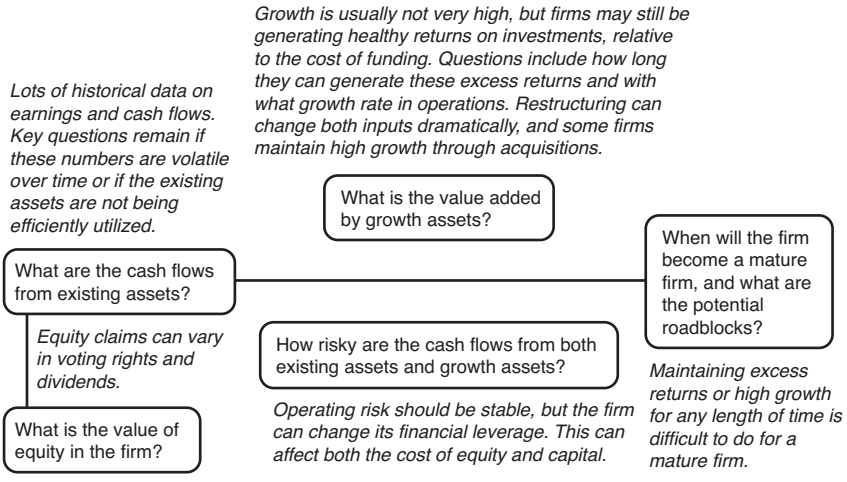


Figure 1.6: Estimation Challenges in Mature Companies

Not surprisingly, mature firms usually are targeted in hostile acquisitions and leveraged buyouts, where the buyer believes that changing how the firm is run can result in significant increases in value.

Winding Down: Dealing with Decline

Most firms reach a point in their life cycle where their existing markets are shrinking and becoming less profitable, and the forecast for the future is more of the same. Under these circumstances, these firms react by selling assets and returning cash to investors. Put another way, these firms derive their value entirely from existing assets, and that value is expected to shrink over time.

Valuing declining companies requires making judgments about the assets that will be divested over time and the profitability of the assets that will be left in the firm. Judgments about how much cash will be received in these divestitures and how that cash will be utilized (pay dividends, buy back shares, retire debt) can influence the value attached to the firm. Another concern overhangs this valuation. Some firms in decline that have significant debt obligations can become distressed. This problem is not specific to declining firms but is more common with them. Finally, the equity values in declining firms can be affected significantly by the presence of underfunded pension obligations and the overhead of litigation costs—more so than with other firms. Figure 1.7 shows these questions.

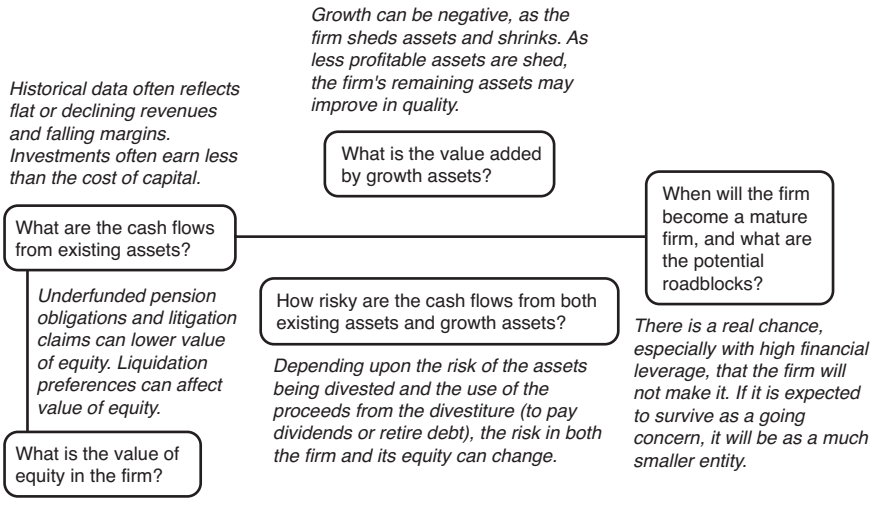


Figure 1.7: Questions About Decline

Valuing firms in decline poses a special challenge for analysts who are used to conventional valuation models that adopt a growth-oriented view of the future. In other words, assuming that current earnings will grow at a healthy rate in the future or forever will result in estimates of value for these firms that are way too high.

Valuation Across the Business Spectrum

The preceding section considered the different issues we face in estimating cash flows, growth rates, risk, and maturity across the business life cycle. In this section, we consider how firms in some businesses are more difficult to value than others. We consider five groups of companies:

- Financial services firms, such as banks, investment banks, and insurance companies
- Cyclical and commodity businesses
- Businesses with intangible assets (human capital, patents, technology)
- Emerging-market companies that face significant political risk
- Multibusiness global companies

With each group, we examine what it is about the firms within that group that generates valuation problems.

Financial Services Firms

While financial services firms have historically been viewed as stable investments that are relatively simple to value, financial crises bring out the dangers of this assumption. In 2008, for instance, the equity values at most banks swung wildly, and the equity at many others, including Lehman Brothers, Bear Stearns, and Fortis, lost all value. It was a wake-up call to analysts who had used fairly simplistic models to value these banks and had missed the brewing problems.

So what are the potential problems with valuing financial services firms? We can frame them in terms of the four basic inputs into the valuation process:

- The existing assets of banks are primarily financial, with a good portion being traded in markets. While accounting rules require that these assets be marked to market, these rules are not always consistently applied across different classes of assets. Since the risk in these assets can vary widely across firms, and information about this risk is not always forthcoming, accounting errors feed into valuation errors.
- The risk is magnified by the high financial leverage at banks and investment banks. It is not uncommon to see banks have debt-to-equity ratios of 30 to 1 or higher, allowing them to leverage up the profitability of their operations.
- Financial services firms are, for the most part, regulated, and regulatory rules can affect growth potential. The regulatory restrictions on book equity capital as a ratio of loans at a bank influence how quickly the bank can expand over time and how profitable that expansion will be. Changes in regulatory rules therefore have big effects on growth and value, with more lenient (or stricter) rules resulting in more (or less) value from growth assets. Finally, since the damage created by a troubled bank or investment bank can be extensive, it is also likely that problems at these entities will evoke much swifter reactions from authorities than at other firms. A troubled bank will be quickly taken over to protect depositors, lenders, and customers, but the equity in the banks will be wiped out in the process.
- As a final point, getting to the value of equity per share for a financial services firm can be complicated by the presence of preferred stock, which shares characteristics with both debt and equity. Figure 1.8 summarizes the valuation issues at financial services firms.

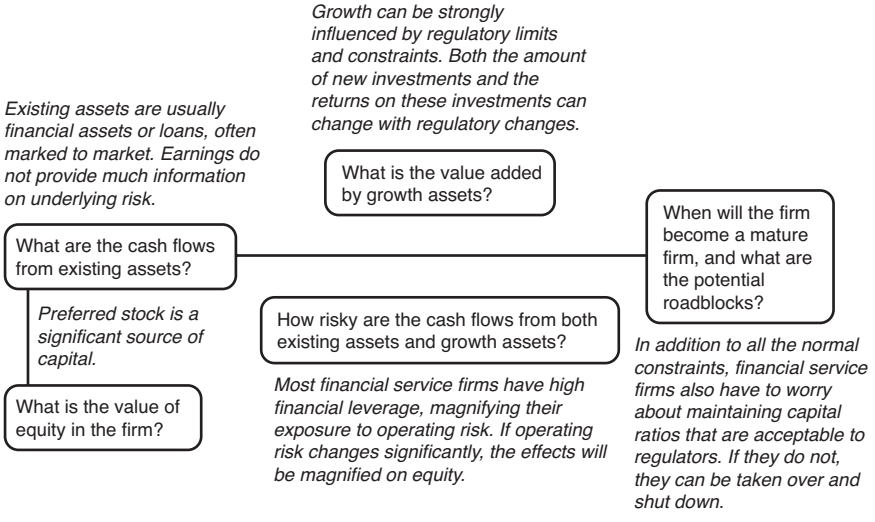


Figure 1.8: Valuation Issues at Financial Services Firms

Analysts who value banks go through cycles. In good times, they tend to underestimate the risk of financial crises and extrapolate from current profitability to arrive at higher values for financial

services firms. In crises, they lose perspective and mark down the values of both healthy and unhealthy banks, without much discrimination.

Cyclical and Commodity Companies

If we define a mature company as one that delivers predictable earnings and revenues, period after period, cyclical and commodity companies will never be mature. Even the largest, most established of them have volatile earnings. The earnings volatility has little to do with the company. It is more reflective of variability in the underlying economy (for cyclical firms) or the base commodity (for a commodity company).

The biggest issue with valuing cyclical and commodity companies lies in the base year numbers that are used in valuation. If we do what we do with most other companies and use the current year as the base year, we risk building into our valuations the vagaries of the economy or commodity prices in that year. As an illustration, valuing oil companies using earnings from 2007 as a base year will inevitably result in too high a value. The spike in oil prices that year contributed to the profitability of almost all oil companies, small and large, efficient and inefficient. Similarly, valuing housing companies using earnings and other numbers from 2008, when the economy was drastically slowing down, will result in values that are too low. The uncertainty we feel about base year earnings also percolates into other parts of the valuation. Estimates of growth at cyclical and commodity companies depend more on our views of overall economic growth and the future of commodity prices than they do on the investments made at individual companies. Similarly, risk that lies dormant when the economy is doing well and commodity prices are rising can manifest itself suddenly when the cycle turns. Finally, for highly levered cyclical and commodity companies, especially when the debt was accumulated during earnings upswings, a reversal of fortune can very quickly put the firm at risk. In addition, for companies like oil companies, the fact that natural resources are finite—only so much oil is under the ground—can put a crimp in what we assume about what happens to the firm during stable growth. Figure 1.9 shows the estimation questions.

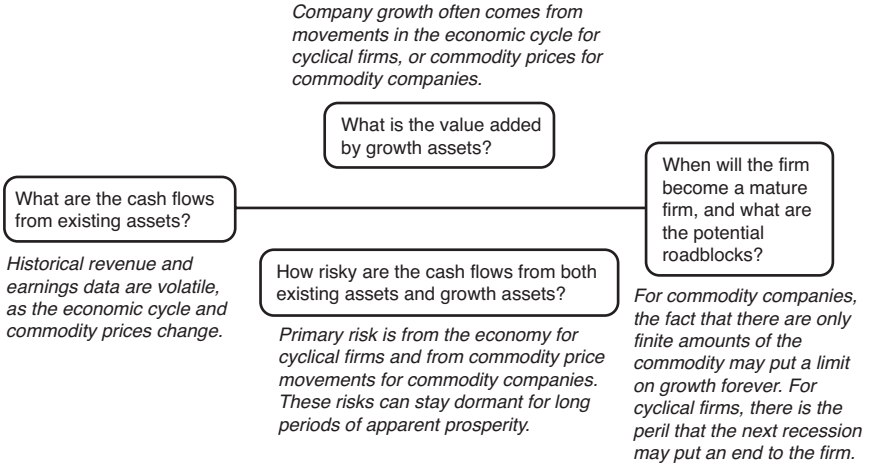


Figure 1.9: Estimation Questions for Cyclical and Commodity Companies

When valuing cyclical and commodity companies, analysts often make implicit assumptions about the economy and commodity prices by extrapolating past earnings and growth rates. Many of these implicit assumptions turn out to be unrealistic, and the valuations that lead from them are equally flawed.

Businesses with Intangible Assets

In the last two decades, we have seen mature economies, such as the U.S. and Western Europe, shift from manufacturing to services and technology businesses. In the process, we have come to recognize how little of the value at many of our largest companies today comes from physical assets (like land, machinery, and factories) and how much of the value comes from intangible assets. Intangible assets range from brand name at Coca-Cola to technological know-how at Google and human capital at firms like McKinsey. As accountants grapple with how best to deal with these intangible assets, we face similar challenges when valuing them.

Let us state at the outset that there should be no reason why the tools that we have developed over time for physical assets cannot be applied to intangible assets. The value of a brand name or patent should be the present value of the cash flows from that asset, discounted at an appropriate risk-adjusted rate. The problem that we face is that the accounting standards for firms with intangible assets are not entirely consistent with the standards for firms with physical assets. An automobile company that invests in a new plant or factory is allowed to treat that expenditure as a capital expenditure, record the item as an asset, and depreciate it over its life. A technology firm that invests in research and development, with the hope of generating new patents, is required to expense the entire expenditure and record no assets, and it cannot amortize or depreciate the item. The same can be said of a consumer products company that spends millions on advertising with the intent of building a brand name. The consequences for estimating the basic inputs for valuation are profound. For existing assets, the accounting treatment of intangible assets makes both current earnings and book value unreliable. The former is net of R&D, and the latter does not include investments in the firm's biggest assets. Since reinvestment and accounting return numbers are flawed for the same reasons, assessing expected growth becomes more difficult. Since lenders tend to be wary about lending to firms with intangible assets, they tend to be funded predominantly with equity, and the risk of equity can change quickly over a firm's life cycle. Finally, estimating when a firm with intangible assets gets to steady state can be complex. On the one hand, easy entry into and exit from the business and rapid changes in technology can cause growth rates to drop quickly at some firms. On the other hand, the long life of some competitive advantages like brand name and the ease with which firms can scale up (they do not need heavy infrastructure or physical investments) can allow other firms to maintain high growth, with excess returns, for decades. The problems that we face in valuing companies with intangible assets are shown in Figure 1.10.

When faced with valuing firms with intangible assets, analysts tend to use the accounting earnings and book values at these firms, without correcting for the miscategorization of capital expenditures. Any analyst who compares the price earnings (PE) ratio for Microsoft to the PE ratio for GE is guilty of this error. In addition, there is also the temptation, when doing valuations, to add arbitrary premiums to estimated value to reflect the value of intangibles. Thus, adding a 30% premium to the value estimate of Coca-Cola is not a sensible way of capturing the value of a brand name.

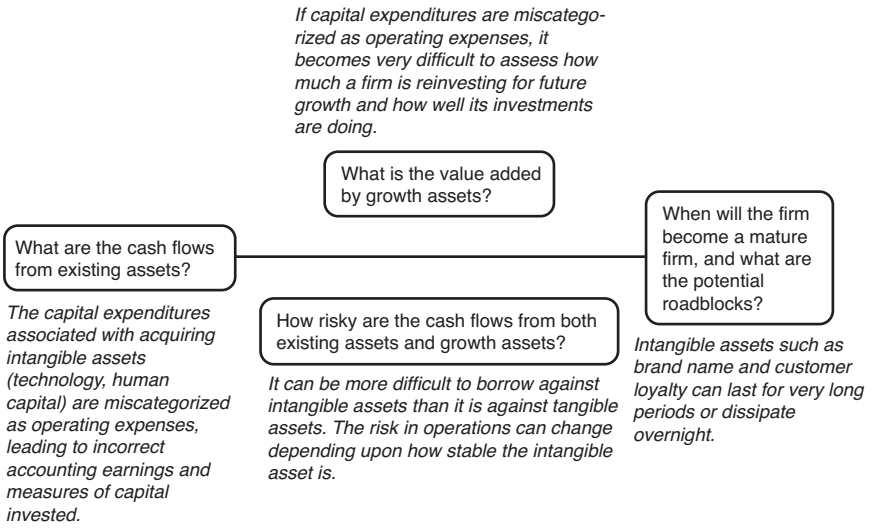


Figure 1.10: Questions About Valuing Companies with Intangible Assets

Emerging-Market Companies

In the last decade, the economies that have grown the fastest have been in Asia and Latin America. With that growth, we have also seen an explosion of listings in financial markets in these emerging economies and increased interest in valuing companies in these markets.

In valuing emerging-market companies, the overriding concern that analysts have is that the risk of the countries that these companies operate in often overwhelms the risk in the companies themselves. Investing in a stable company in Argentina will still expose you to considerable risk, because country risk swings back and forth. While the inputs to valuing emerging-market companies are familiar—cash flows from existing and growth assets, risk and getting to stable growth—country risk creates estimation issues with each input. Variations in accounting standards and corporate governance rules across emerging markets often result in a lack of transparency when it comes to current earnings and investments, making it difficult to assess the value of existing assets. Expectations of future growth rest almost as much on how the emerging market that the company is located in will evolve as they do on the company's own prospects. Put another way, it is difficult for even the best-run emerging-market company to grow if the market it operates in is in crisis. In a similar vein, the overlay of country risk on company risk indicates that we have to confront and measure both if we want to value emerging-market companies. Finally, in addition to economic crises that visit emerging markets at regular intervals, putting all companies at risk, there is the added risk that companies can be nationalized or appropriated by the government. The challenges associated with valuing emerging-market companies are shown in Figure 1.11.

Analysts who value emerging-market companies develop their own coping mechanisms for dealing with the overhang of country risk, with some mechanisms being healthier than others. In its most unhealthy form, analysts avoid even dealing with the risk. They switch to more stable

currencies for their valuations and adopt very simple measures of country risk, such as adding a fixed premium to the cost of capital to every company in a market. In other cases, their preoccupation with country risk leads them to double-count and triple-count the risk and pay insufficient attention to the company being valued.

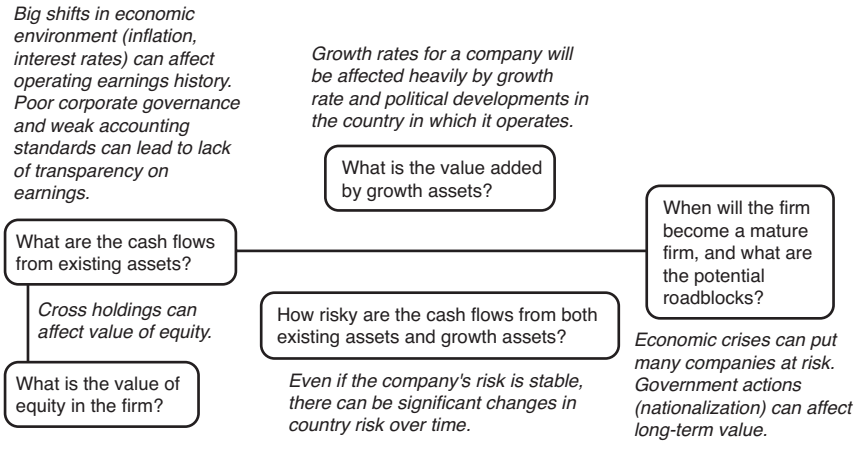


Figure 1.11: Challenges Associated with Valuing Emerging-Market Companies

Multibusiness and Global Companies

As investors globalize their portfolios, companies are also becoming increasingly globalized, with many of the largest ones operating in multiple businesses. Give that these businesses have very different risk and operating characteristics, valuing the multibusiness global company can be a challenge to even the best-prepared analyst.

The conventional approach to valuing a company has generally been to work with the consolidated earnings and cash flows of the business and to discount those cash flows using an aggregated risk measure for the company that reflects its mix of businesses. Although this approach works well for firms in one or a few lines of business, it becomes increasingly difficult as companies spread their operations across multiple businesses in multiple markets. Consider a firm like General Electric, a conglomerate that operates in dozens of businesses and in almost every country around the globe. The company's financial statements reflect its aggregated operations, across its different businesses and geographic locations. Attaching a value to existing assets becomes difficult, since these assets vary widely in terms of risk and return-generating capacity. While GE may break down earnings for its different business lines, those numbers are contaminated by the accounting allocation of centralized costs and intrabusiness transactions. The expected growth rates can be very different for different parts of the business, in terms of not only magnitude but also quality. Furthermore, as the firm grows at different rates in different businesses, its overall risk changes to reflect the new business weights, adding another problem to valuation. Finally, different pieces of the company may approach stable growth at different points in time, making it difficult to stop and assess the terminal value. Figure 1.12 summarizes the estimation questions that we have to answer for complex companies.

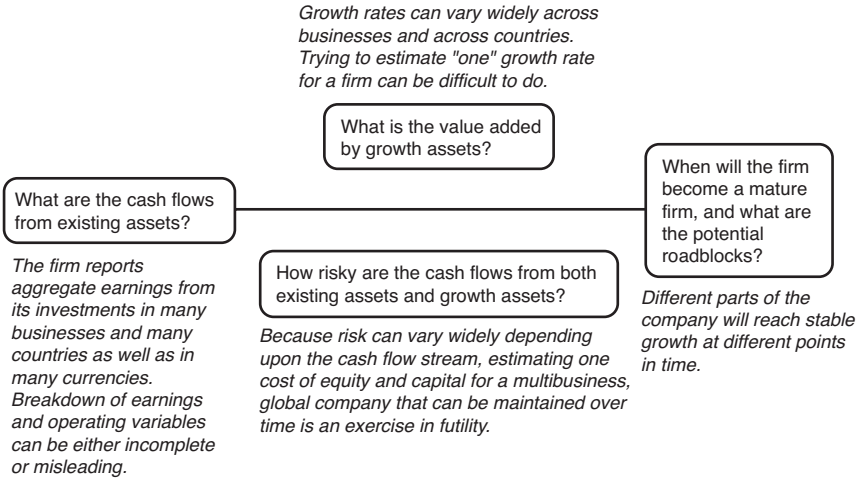


Figure 1.12: Estimation Questions for Complex Companies

Analysts who value multibusiness and global companies often draw on the averaging argument to justify not knowing as much as they should about individual businesses. Higher growth (or risk) in some businesses will be offset by lower growth (or risk) in other businesses, they argue, thus justifying their overall estimates of growth and risk. They underestimate the dangers of the unknown. All too often, with companies like these, what you do not know is more likely to contain bad news than good news.

Seeing the Dark Side of Valuation

When confronted with estimation challenges, analysts have one of two choices. The healthy response is to confront the challenge and adapt existing models to reflect the differences in the company being valued. The more common response is to bend the rules of valuation and use shortcuts to justify whatever price they are predisposed to pay for the company. The latter approach is "the dark side of valuation." This section looks at its many manifestations.

Input Phase

In the input phase, we look for the standard starting points for valuing individual companies—earnings and operating details from the most recent financial statements; forecasts for the future, provided by analysts and management; and data for macroeconomic inputs such as risk-free rates, risk premiums, and exchange rates. We see some standard patterns in valuations:

- **Base year fixation**: Analysts often treat the current year as the base year in valuation and build these numbers in making forecasts. While this is understandable, it can also lead to serious errors in valuation when either of the following occurs:
  - Current numbers do not reflect the firm's long-term earnings capability. As we noted earlier, this is especially true of commodity and cyclical companies, but it is also the case for young and start-up companies.

- Inconsistencies in the accounting treatment of operating and capital expenditures are skewing current values for earnings and book value. With technology and human capital companies, this will be an issue.

- **Outsourcing key inputs**: When it comes to macroeconomic inputs, analysts usually go to outside sources. This is especially true with equity risk premiums and betas, where services offer estimates of the numbers, backed up by volumes of data. While this may give analysts someone else to blame if things go wrong, it also means that little independent thought goes into whether the numbers being used actually make sense.
- **Trusting management forecasts**: The most difficult task in valuing a company is forecasting future revenues, earnings, and reinvestment. This is especially true with younger companies that have significant growth prospects. When managers offer to provide forecasts of these numbers, analysts, not surprisingly, jump at the opportunity and rationalize their use of these forecasts by arguing that managers know more about the company than they do. What they fail to consider is that these forecasts are likely to be biased.

Valuation Phase

The inputs feed into valuation models and metrics to provide the final judgments on value. At this stage in the process, it is natural for analysts to feel uncertain about the reliability of these numbers—more so for some companies than others. In the process of dealing with this uncertainty, some common errors show up in valuations:

- **Ignoring the scaling effect**: As firms get larger, it becomes more and more difficult to maintain high growth rates. In making forecasts, analysts often fail to consider this reality and continue to use growth rates derived from history long into their forecast periods.
- **Inconsistencies in valuation**: Good valuations should be internally consistent, but it is easy for inconsistencies to enter valuations. As you will see in the coming chapters, assumptions about growth, reinvestment, and risk not only have to make sense individually but also have to tie together. Estimating high growth rates with little or no reinvestment into the business to generate this growth may be possible, but it is unlikely. The assumptions that we make about inflation in our cash flow estimates have to be consistent with the assumptions (often implicit) about expected inflation in interest rates and exchange rates.
- **Valuing for the exception**: Analysts often draw on anecdotal evidence to justify their assumptions. The fact that Wal-Mart was able to continue growing, even as it became larger, is used to justify maintaining high revenue growth rates for firms for long periods. Analysts point to companies like Coca-Cola and Microsoft to justify assumptions about maintaining high margins and returns on investment for small-growth companies. It is worth nothing that Wal-Mart, Coca-Cola, and Microsoft are the exceptions, rather than the rule.
- **Paradigm shifts**: When analysts abandon age-old principles of economics and valuation, talking about how the rules have changed, it is time to be skeptical. It is true that economies and markets change, and we have to change with them. But we cannot repeal

the laws of demand and supply or the notion that businesses eventually have to make money to be valuable.

- **Black-box models**: As data becomes more easily accessible and building bigger models becomes more feasible, one response to uncertainty is to build bigger and more complex models. Two problems come out of more detailed models. One is the fact that they require far more inputs to arrive at a number. Uncertainty often multiplies as we add more detail, and it is "garbage in, garbage out." The other problem is that the model becomes a black box, with analysts having little sense of what happens inside the box.
- **Rules of thumb**: If one response to complexity is to build bigger and better models, the other response is to look for a simple solution. In many valuations, this takes the form of using a rule of thumb to arrive at the value of an asset. An analyst faced with a particularly troublesome set of inputs may decide to value a company at three times revenues because that is what investors have traditionally paid for companies in this sector. While using these shortcuts may provide the illusion of precision, it is far better to confront uncertainty than to ignore it.

Post-Valuation Phase

In many cases, the real damage to valuation principles occurs after the valuation has been done—at least in terms of mechanics. At least two common practices wreak havoc on valuations:

- **Valuation garnishing**: This is the all-too-common practice of adding premiums and discounts to estimated value to reflect what the analyst believes are missed components. It is not uncommon in acquisition valuations, for instance, to add a 20% premium for control, just as it is standard practice in private company valuation to reduce value by 20 to 25% to reflect illiquidity. Similar premiums/discounts are added/subtracted to reflect the effects of brand names and other intangibles and emerging-market risk. The net result of these adjustments is that the value reflects whatever preconceptions the analyst might have had about the company.
- **Market feedback**: With publicly traded companies, the first number that we look at after we have done a valuation is the market price. When analysts are uncertain about the numbers that go into their valuations, big differences between the value and the market price lead to their revisiting the valuation. As inputs change, the value drifts inexorably toward the market price, rendering the entire process pointless. If we believe that markets are right, why bother doing valuation in the first place?

In summary, the dark side of valuation can take many different forms, but the end result is always the same. The valuations we arrive at for individual businesses reflect the errors and biases we have built into the process. All too often, we find what we want to find rather than the truth.

Conclusion

Some companies are easier to value than others. When we have to leave the comfort zone of companies with solid earnings and predictable futures, we invariably stray into the dark side of valuation. Here we invent new principles, violate established ones, and come up with unsustainable values for businesses.

This chapter described the four inputs that we have to estimate to value any company:

- The expected cash from investments that the business has already made (existing assets)
- The value that will be added by new investments (growth assets)
- The risk in these cash flows
- The point in time where we expect the firm to become a mature firm

The estimation challenges we face will vary widely across companies, so we must consider how estimation issues vary across a firm's life cycle. For young and start-up firms, the absence of historical data and the dependence on growth assets make estimating future cash flows and risk particularly difficult. With growth firms, the question shifts to whether growth rates can be maintained and, if so, for how long, as firms scale up. With mature firms, the big issue in valuation shifts to whether existing assets are being efficiently utilized and whether the financial mix used by the firm makes sense. Restructuring the firm to make it run better may dramatically alter value. For declining firms, estimating revenues and margins as assets get divested is messy, and considering the possibility of default can be tricky. The estimation challenges we face can also be different for different subsets of companies. Cyclical and commodity companies have volatile operating results. Companies with intangible assets have earnings that are skewed by how accountants treat investments in these assets. The risk in emerging-market and global companies can be difficult to assess. Finally, valuing any company can become more difficult in economies where the fundamentals—risk-free rates, risk premiums, and economic growth—are volatile.

In the last part of the chapter, we turned our attention to how analysts respond to uncertainty, with an emphasis on some of the more unhealthy responses. The dark side of valuation manifests itself at each phase of a valuation; our task for the rest of the book is clear. Accepting the fact that uncertainty will always be with us and that we have to sometimes value "difficult" businesses, we will look at healthy ways of responding to uncertainty.

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Page numbers followed by *n* indicate footnotes.

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