# THE LARGE-CAP PORTFOLIO

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# THE LARGE-CAP PORTFOLIO

## Value Investing and the Hidden Opportunity in Big Company Stocks

**Thomas Villalta**

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*For Lauren and Benjamin*

# Contents

## PART II: MARKET INEFFICIENCY

# Acknowledgments

Writing does not come easy for me. As a consequence, this book was a fairly significant undertaking that used enormous amounts of time and energy. First, I must acknowledge my wife, Courtney, who allowed me almost a year's worth of long days and weekends in order to get this book completed. I would note that my wife was pregnant and gave birth to our second child in this time frame. Not many spouses would be as understanding, given the circumstances. I love you, Courtney, and I couldn't have done this without you.

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Successful individuals do not become successful without the help of others. Some of these people are current colleagues, some are former colleagues, some are family, and some are educators. Thank you to all who've enabled my success. I wouldn't be doing what I love without your help.

# Preface

I first thought about writing this book in 2010, when my friend Brian Bares and I were having lunch at a restaurant in Austin, Texas. Over Kung Pao chicken, I listened as Brian explained to me his reasons for writing a book on small-cap investing, *The Small-Cap Advantage*. In the end, he explained, it was about telling investors why he does what he does. He noted that he felt he had to write it. This really struck a chord with me and is the main reason why I wrote this book. I feel compelled to explain why it is that I see value in the active management of domestic mid- to large-cap stocks and how I go about identifying opportunities and researching opportunities. To Brian's point, it would be pretty sad if I couldn't articulate why I do what I do and how it fits into the broader investing landscape.

In addition, however, after some research, I found that there is really not a lot written about large-cap stocks. If one goes to Amazon.com or Barnes & Noble and searches for a book on "large-cap investing" or "large-company stocks". . . nothing. True, there are a handful of books on *blue-chip* stocks, but there is really nothing on large-cap stocks as an asset class and investing universe. Moreover, *blue chips* generally represent a much smaller subset of the large-cap investing universe and are reflective of representativeness biases discussed in Chapter 5 of this book. They represent stocks that are of "high quality," and as I'll note numerous times in this book, there are problems with looking at stocks in this manner. So, in addition to feeling compelled to articulate my rationale and process for investing in this arena, I also felt that an important subset of the investing landscape was inadequately addressed in books and other mediums. In short, there is a need for information on large-cap stocks and large-cap portfolio management.

We all do things for different reasons. Some of us do what we do because we were raised to do it. Some of us do what we do because we've been trained to do it. Some of us do things reflexively, without ever questioning why. That's not really the way I am. I've always been predisposed to ask "why?" I'm not sure everyone digs as deep into the broader question of why values exist

in the realm of investing. Most investment managers and research analysts learn their craft by apprenticing for other managers, taking employment at one of any number of different investment outlets: investment management firm, insurance company, mutual fund, Wall Street bank, trust company, or the like. I started in the investment management industry in what I term a *consultative* capacity. I learned to evaluate other managers' performance and processes. I examined many facets of traditional investment firms and recommended firms for use by our clients. I was struck, however, by the similarity of the message. It seemed to be "We really get to know a company well" or "We look for undervalued stocks and then we look for a catalyst for a change in fortunes." These become very unsatisfying answers when you hear them over and over again, and ultimately the message seems to be "We dig a little deeper than the next guy, and we're smarter than the other million or so investors out there looking at stocks and evaluating stocks on a daily basis."

Practitioners are always looking for stocks that are cheap or stocks that trade for less than their "intrinsic" value. But, given the numerous analysts and portfolio managers weighing in on the value of stocks on a minute-by-minute basis, why do these values exist? Who's making the mistakes that allow active management to succeed? In short, what are investors looking for? I think if you ask professional investors for the answers to these questions, you won't get satisfactory answers. This becomes especially true when you try and link their processes to reasons why stocks trade inefficiently.

Without giving too much away, I would note that I believe one can add value in the active management of domestic mid- to large-cap stocks. I don't think it's easy to add value, but I do believe one can outperform passive benchmarks over time. This is not to say that I think investors can outperform indices in every period or over short time horizons. Indeed, it's not clear what time horizon is pertinent. The nature of the market is such that strict definitions and determinations are extraordinarily difficult to make, and the consultants who make such decisions for individual and institutional investors have a very difficult job in this regard. One is faced with an infinite number of time periods from which to choose: 3-year, 5-year, 10-year, since inception, or periods in between. We can draw a line in the sand with regard to a time period, but I'm not sure it makes much of a difference. Different environments create different situations for different types of investors.

Indeed, this is a problem that all portfolio managers face at some point in time. We are looking for inefficiently priced stocks, but the market gives no clear indication as to when such inefficiencies are rectified. I'll spend half of Chapter 6 on this issue and its relationship to active management. I do believe that over time a stock's price converges on its intrinsic value, but as

John Maynard Keynes is credited with conceding, "The market can stay irrational longer than you can stay solvent."[1] Consequently, it may be a bumpy ride, and one necessarily needs patience in identifying and capitalizing on investment opportunities.

The volatility we've seen in the domestic stock market over the past few years has been both unnerving and challenging. More than ever, investors need a blueprint for keeping a course of action. Wild swings in individual common stocks can create opportunities, but they can also lead one to disastrous decisions. Knowledge is the key to success. One must be clear about why they are invested and have a rationale for holding each common stock in their portfolio. In the absence of a clear rationale, decision making becomes perverted and myopic. In this light, we can view market volatility as containing elements of danger and elements of opportunity—both are present. In short, understanding how opportunities in the market arise will hopefully allow one to take advantage of the opportunities and stay the course in volatile times. Market volatility is likely here to stay, and it's important that one not become paralyzed by the extreme gyrations. Consequently, while Keynes's words ring true to me, they present the glass as half empty rather than half full. I'm fonder of Warren Buffett's wisdom, as he beckons investors to "Be fearful when others are greedy, and be greedy when others are fearful."[2] Hopefully, by understanding where value lies in the large-cap universe, one is able to not only be opportunistic, but also stay true to Mr. Buffett's words.

## Parts of This Book

Broadly speaking this book is based on two important premises. The first is that markets for large-cap and mid- to large-cap stocks are inefficient. The wild swings we see in large-cap benchmarks such as the Standard & Poor's (S&P) 500 Index are symptomatic of a market that fights to reconcile the passion that we as humans possess with an objective assessment of uncertainties. This is difficult in the best of circumstances but becomes most difficult in times of euphoria and times of despair.

The second premise that this book is largely concerned with is the source of opportunities. I propose that, unlike some types of markets (principally markets for micro-cap stocks, small-cap stocks, and emerging-market stocks), mid- to large-cap inefficiencies are driven by errors in investor behavior rather than what I term *structural factors.* This is a distinction that I can't stress the importance of enough. One must be aware of what one is looking for, in order to determine if one has found it. Domestic mid- to large-cap stocks are

not underresearched. Nor are they illiquid or subject to other structural factors. Domestic mid- to large-cap stocks become overvalued or undervalued due to errors in the assessment of uncertain assumptions that underlie their valuations. Identifying important assumptions that drive valuation and then determining the behavioral errors that investors make becomes the nexus for finding opportunities in the market.

To this end, understanding the heuristics—or short-cuts that we as humans make in our decision-making process—will allow us to better understand the errors we may be making in assessing important assumptions that underlie intrinsic value computations. In this regard, this book really straddles two very different realms of economic thought: behavioral versus classical assessments of market efficiency. This book acknowledges the importance of each of these characterizations of the market, and takes the view that they are not mutually exclusive. Rather, the investor should consider that markets ride a continuum of efficiency spanning egregious inefficiency to cold rationality. One should seek to invest in securities when their pricing is inefficient, but sell securities when their price converges on a more efficient assessment of a company's merits.

The key element to this process is *time*. The time frame becomes the link between market efficiency and market inefficiency. Pricing in the market can be very inefficient at any given point in time, but pricing will gradually work toward, or converge on, objective, coldly rational efficient pricing. How long this takes is not known. Moreover, the time frame can become a manager's undoing and an investor's worst enemy.

This book is organized into three interrelated parts. Part I will discuss the state of the market for actively managed large-cap stocks. This will include an examination of the trends in passive investing and what such trends portend for the active manager over the long term. Part I will also include a chapter that discusses the difference between risk and uncertainty, an important distinction that will prove useful as we examine the errors humans make in approaching uncertainties.

Part II will start with an explanation of market efficiency and the theories that underpin this notion. With our understanding of how markets are understood to be efficient, we will next look at whether the market efficiently prices common stocks and empirical evidence of investor irrationality. We will then, over the course of two chapters, critique the three theories that support the broader notion of market efficiency, offering theoretical counterpoints to arguments that contend markets are efficient pricing mechanisms. Finally, I'll end Part II by discussing the conventional view of market inefficiencies, and their relationship to both the efficient markets hypothesis and the three

theories underpinning market efficiency. Importantly, much of Part II will focus on errors in judgment and the ways in which such errors pervert assessments of value.

Finally, Part III will discuss methods one can integrate into one's investment process. These methods allow one to structure an investment process to conform with the opportunity set available to large-cap stock investors. Opportunities are available in the large-cap subset of the market, but one's process must be attuned to take advantage of such opportunities. This will include some practical ideas for identifying large-cap stock opportunities as well as analyzing large-cap opportunities. Additionally, Chapter 10 provides a case study on a timely investing opportunity in the constructs of the ideas presented. Part III will end with some thoughts on managing large-cap portfolios and the challenge one faces in structuring portfolios to outperform broad market benchmarks.

It's worth noting that there is a companion web site that is available to readers of this book, www.wiley.com/go/villalta. This web site offers tools that help the reader implement the methods discussed in Part III of this book.

While this book is largely focused on the need to incorporate behavioral insights into one's process, I hope that the reader does not take this as a recipe to forgo extensive research. I will time and again speak to the need to balance one's research emphasis. However, while I note that one is not likely to find hidden secrets in a company's 10-Ks or investor meetings with management, this is not to say that one shouldn't undertake extensive research and analysis. It is to say that one should balance one's research with a broader understanding of human behavior and the ways in which decision making can be perverted. This is a unique perspective on stock research and one that I believe will serve the large-cap portfolio manager especially well.

## Notes

1. This quotation is often credited to John Maynard Keynes. However, as Jason Zweig explained in early 2011, we don't have definitive proof that he said as much. At any rate, whether Keynes said it or not, it does ring true to me. Jason Zweig, "Keynes: He Didn't Say Half of What He Said. Or Did He?" wsj.com, February 11, 2011.
2. Warren Buffett, "Buy American. I Am." *New York Times,* October 17, 2008.

PART ONE

# The Large-Cap Opportunity and Challenge

# CHAPTER 1

# Trends in Large-Cap Investing and the Opportunities They Present

Why am I focusing on mid- to large-cap stocks? Because this investment terrain is being abandoned. Opportunities exist where others fear to tread, and increasingly it appears that money managers and investors fear to tread in the pool of actively managed mid- to large-cap stocks. Over the past 20 years we've seen a paradigm shift in investment management where active management of large-cap domestic common stocks, once considered a legitimate exercise, is now held as futile. Passive strategies have gone from being niche products to being a significant part of many investment portfolios.

It's not just that indexed equities have grown as a proportion of investments. A logical, rational case has been made that active investment is devoid of value. This case, generally made in the context of market efficiency, is buttressed by empirical research purporting to show that time and time again, year after year, active managers fail to add value.

But is this really the case? Is active management devoid of value in the large-cap arena? As we continue to learn from economic research into investor behavior, and witness the market's volatile gyrations, it's difficult not to accept that large-cap stocks trade as inefficiently as stocks in other subsets of the market. However, that's not to say that large-caps are not different. Large-cap benchmarks are less diversified than benchmarks for other

subsets of the market. This presents challenges for the large-cap investor that one doesn't find in other areas of the market. As the investing landscape has changed, as the proportion of money invested in passive large-cap strategies has ballooned, so has the proportion of active managers who've simply chosen not to compete. I will propose in this chapter that the failure of active management to deliver value-added results is deliberate. A large and growing subset of active managers is simply hugging benchmarks too closely, removing any ability to outperform passive index strategies. Finally, I would argue that trends in passive investing and closet indexing over the past 20 years are setting the stage for greater inefficiencies in the large-cap arena. While I think that a case can be made that now is a very opportunistic time to invest in actively managed large-cap stock strategies, the larger point that I'll make throughout this book is not one that is of a limited time frame.

What I propose in this chapter is based on longer-term trends and an evolution in the view of active management. Actively managed large-cap portfolios can add value if constructed properly. Having a complete understanding of what drives inefficiencies in the large-cap subset of the market is of paramount importance in constructing an investment strategy to add value in this space. This book will move in this direction, but we'll start with a broader perspective on the state of large-cap investing. Just as understanding the state of any industry gives us insights into that industry's long-term prospects, understanding the state of large-cap investing will give us insights into what can be expected as time moves on.

This chapter will start by explaining what a large-cap stock is and how it relates to benchmark indexes like the Standard & Poor's (S&P) 500 Index. I'll then describe two concurrent trends in investing: the wide acceptance of passive benchmark index investing and the growth of "closet" index investing strategies. I'll end the chapter with some thoughts on the ramifications of these trends.

## Defining a Large-Cap Stock

What is a large company? There are many ways to define *large* in the context of America's largest companies. Moreover, there are really two questions that an analyst must answer in terms of size:

1. What is the arbiter of size?
2. What is the cutoff in terms of delineations of large and small?

**TABLE 1.1** 10 Largest Companies in the United States—Based on 2010 Number of Employees

| | 2010 Employees | | 2010 Employees |
|---|---|---|---|
| Wal-Mart Stores | 2,100,000 | Kroger | 338,000 |
| IBM | 426,751 | Hewlett-Packard | 324,600 |
| United Parcel Service | 400,600 | Sears Holdings | 312,000 |
| McDonald's | 400,000 | PepsiCo | 294,000 |
| Target | 355,000 | Bank of America Corp. | 288,122 |

*Data source:* CNN Money, "Fortune 500: Our Annual Ranking of America's Largest Corporations 2011" (http://money.cnn.com/magazines/fortune/fortune500/2011/full_list/index.html).

Let's consider the first question to begin with. There are a multitude of data points that could be useful in determining a company's size. From an economic and societal perspective, the number of people a company employs could be considered a very good indicator of size. This measure provides one sense of the impact the company has on the overall economy, as the wages paid by the company *trickle down* to other segments of the economy. Moreover, the more individuals a company employs, the greater the company's impact on the livelihoods and happiness of many in society. *Fortune* magazine, in their yearly Fortune 500 rankings, provides a number of characteristics on which one can view companies that are domiciled in the United States. In terms of employees, Table 1.1 provides a list of the 10 largest employers ranked by 2010, year-end employee count. Some of these companies, such as Kroger, may not strike many as being a large-capitalization enterprise. Others likely fit squarely in our minds as representative of this subset of the market.

Alternatively, we could consider the company's impact in the marketplace. It is logical to conclude that the more goods a given company sells, the larger the company is. To this end, revenues are a good indicator of company size. If we look at the largest companies in the domestic market, by revenues, the top 10 would be as found in Table 1.2.

Still, while revenues give us one indication of size, one could also make the case that a company's profitability is more important and a better indicator of size. Profits level the playing field, as they are a true indication of a company's impact on an underlying society. For example, if I'm a company that resells imported goods, making a modest marginal profit on each good, what impact do I have on my society or economy as a whole? One could argue that if I resell enough goods, then the impact is sizable. However, if I sell a large amount of goods, but my overall profit is small, then the impact

**TABLE 1.2** 10 Largest Companies in the United States—Based on 2010 Revenues

| | Revenues ($ millions) | | Revenues ($ millions) |
|---|---|---|---|
| Wal-Mart Stores | 421,849 | General Electric | 151,628 |
| ExxonMobil Corp. | 354,674 | Berkshire Hathaway | 136,185 |
| Chevron Corp. | 196,337 | General Motors | 135,592 |
| ConocoPhillips | 184,966 | Bank of America Corp. | 134,194 |
| Fannie Mae | 153,825 | Ford Motor Company | 128,954 |

*Data source:* CNN Money, "Fortune 500: Our Annual Ranking of America's Largest Corporations 2011" (http://money.cnn.com/magazines/fortune/fortune500/2011/full_list/index.html).

**TABLE 1.3** 10 Largest Companies in the United States—Based on 2010 Profits

| | Profits ($ millions) | | Profits ($ millions) |
|---|---|---|---|
| ExxonMobil | 30,460 | Wal-Mart Stores | 16,389 |
| AT&T | 19,864 | IBM | 14,833 |
| Chevron | 19,024 | Apple | 14,013 |
| Microsoft | 18,760 | Johnson & Johnson | 13,334 |
| J. P. Morgan Chase & Co. | 17,370 | Berkshire Hathaway | 12,967 |

*Data source:* CNN Money, "Fortune 500: Our Annual Ranking of America's Largest Corporations 2011" (http://money.cnn.com/magazines/fortune/fortune500/2011/full_list/index.html).

is more minor. This would be especially true if the goods were imported from another country or were manufactured by another company. In short, profits are the most important arbiter of success and are arguably a very good indicator of the size of a company. The top 10 companies in terms of 2010 profits are provided in Table 1.3.

Finally, we could also look at market value, as found in Table 1.4. Conceptually, market capitalization should not only account for the company's current earning power, but its growth prospects as well.

There are still more ways in which we could look at a company's size. We could look at total assets on the balance sheet, we could look at book value of equity, or we could look at enterprise value (debt and equity). In short, there are a number of ways in which to classify a company as large, and while there is some commonality among various ranking schemes, as can be seen in Tables 1.1 through 1.4, there are also significant disparities. Some companies, such as ExxonMobil Corp., would be considered one of the 10 largest

**TABLE 1.4** 10 Largest Companies in the United States—Based on Market Capitalization

| | 3/25/2011 ($ millions) | | 3/25/2011 ($ millions) |
|---|---|---|---|
| ExxonMobil Corp. | 414,638.0 | General Electric | 209,715.2 |
| Apple | 323,866.1 | IBM | 197,784.3 |
| Microsoft | 215,269.0 | Google | 186,399.2 |
| Chevron Corp. | 214,355.5 | Wal-Mart Stores | 182,764.3 |
| Berkshire Hathaway | 210,787.5 | J. P. Morgan Chase & Co. | 182,683.8 |

*Data source:* CNN Money, "Fortune 500: Our Annual Ranking of America's Largest Corporations 2011" (http://money.cnn.com/magazines/fortune/fortune500/2011/full_list/index.html).

companies in the United States, regardless of the metric used to define large-cap. Other companies, such as AT&T and Kroger, are less consistently represented within various definitions of large company.

From a benchmarking and asset allocation standpoint, the standard generally used is market capitalization. Most indices, such as the S&P 500 Index, the Nasdaq Composite, the Russell 1000 Index, and the Wilshire 5000 Index, are weighted by market capitalization. In short, the index represents a summation of the market value of all of the stocks that comprise the index (more on this in the next section). As a consequence, the largest companies have a larger impact on the performance of the index.

From an investment management standpoint, as we are always evaluating the efficacy of active management in relation to a benchmark index, it makes sense to use benchmark indices as the basis for determining both the universe from which one is selecting as well as the definition of what constitutes a stock in the context of what an index represents. Thus, as the Russell 1000 Index is an index of domestic mid- to large-cap stocks, its definition of mid-cap and large-cap stocks is a definition with considerable weight.

As to the second question pertaining to the cutoff for classification purposes, there are, again, a number of opinions on what constitutes a large-capitalization stock, a mid-capitalization stock, or a small-capitalization stock. Russell Investments, the creator and publisher of the Russell family of indices, has made a fairly encompassing and reasonable assessment of various market capitalization spectrums. The Russell 3000 Index, a broad market benchmark, is comprised of two other Russell indices: the Russell 1000 Index, a domestic mid- to large-cap index; and the Russell 2000 Index, a small-capitalization benchmark. The Russell 1000 Index itself consists of two Russell indices: the Russell MidCap Index, which is the 800 smallest issues

in the Russell 1000 Index; and the Russell Top 200 Index, which is the 200 largest issues in the Russell 1000 Index. One definition of large-capitalization or large company stocks could be the 200 largest companies by market capitalization in the domestic stock market. Note, however, that this is simply one index provider's take on what constitutes a large-capitalization stock.

There can be, and there are, considerable differences between various indices representing the same asset class groupings (large-cap, mid-cap, and small-cap). For example, the range of market capitalizations for the Russell 1000 Index and the S&P 500 Index are very different. As one would expect, the Russell 1000 Index, holding more stocks, based on market capitalization, will generally have a higher proportion of its overall index in what Russell considers middle-capitalization stocks. In truth, this distinction is minor, as the index is weighted by market capitalization—more on this next.

## Understanding the S&P 500 Index

While this section will focus on the S&P 500 Index, the construction of widely used benchmark indices all follow a similar methodology. The S&P 500 Index is explained here, as it's a widely used index for both passive investing purposes and as a benchmark for evaluating domestic mid- to large-cap stock strategies.

Like the Dow Jones Industrial Average (DJIA), the S&P 500 Index is not all-encompassing. It is not the 500 largest companies in the United States, although the vast majority of companies in the index are pulled from the 500 largest companies. Professional investment consultants prefer benchmarks that represent the opportunity set from which a money manager or mutual fund is selecting securities, such as the Russell and Wilshire indices. These two index families are *rules* based and not formed by committee. For example, the Russell 1000 Index is comprised of the common stocks of the 1,000 largest companies in the United States. The *rule*, with respect to the Russell 1000 Index, is market capitalization, or a company's number of common stock shares outstanding multiplied by the company's common stock price. According to Russell Investments, the "Russell 1000 Index is constructed to provide a comprehensive and unbiased barometer for the large-cap segment."[1]

The S&P Index Committee at Standard and Poor's, the company that publishes the S&P 500 Index, does not rely singularly on rules for selecting securities for the S&P 500 benchmark. While I think that Standard & Poor's recognizes the benchmark value of the S&P 500 Index and its use as both an investable benchmark and an evaluation benchmark, the index was originally

constructed to be representative of the U.S. economy. Standard & Poor's describes the S&P 500 Index as being comprised of "500 leading companies in leading industries of the U.S. economy."[2]

The S&P 500 Index, like many leading benchmark indices (Russell and Wilshire included) is a market capitalization weighted index. This means that the larger the company in the index, the greater that company's effect on the performance of the index.

An index value for the S&P 500 is calculated on a daily basis. This calculation is the sum of the *value* of each company in the index, where *value* is defined as the free-floating value of the common equity of the company—the price of the stock ($Price_i$) multiplied by the number of shares outstanding ($Shares_i$) multiplied by the proportion of shares that are tradable by the general public, the investable weight factor ($IWF_i$). Most indices also scale this resulting number (which could be in the trillions) by dividing the sum by a *divisor*. The formula (1.1) used to calculate the value for the S&P 500 Index is provided below:

$$\text{Index Value} = \frac{\sum_{i=1}^{500} (Price_i \times Shares_i \times IWF_i)}{Divisor} \qquad 1.1$$

The "Index Value" is then used to calculate day-to-day *price* returns for the benchmark. To calculate the *total return* for the index, a sum of the dividends paid for each stock paying a dividend on a given day are divided by the divisor and added to the "Index Value." This augmented index value is then used as the basis for calculating the total return for a given day.

The calculations are only important in so far as they show that the larger the company in the index, the greater that company's performance will impact the return for the total index. There are other methods for calculating index values. Some indices are price weighted (the DJIA, for example), and some are equal weighted (variations of S&P and MSCI indices). Market capitalization–weighted indices are often justified on the grounds that they represent the "market portfolio," an important element to the capital asset pricing model (CAPM) and modern portfolio theory. The S&P 500 Index is also, in practice, used as the market portfolio for risk assessment in the valuation of specific companies[3,4]. For whatever reason, there is no mistaking that market capitalization–weighted benchmarks are the preferred bogeys for money manager and mutual fund performance evaluation. Moreover, the S&P 500 Index in particular is the preferred investable index for domestic mid- to large-cap stocks.

## Examining the Growth of Indexed Equities

Wells Fargo & Company, now one of the largest diversified financial firms in the United States, started the first index fund in 1971, when the Samsonite Company pension fund engaged the bank to manage $6 million in assets in a passive NYSE portfolio. This set the stage for what would eventually become a significant proportion of institutional and retail portfolios.

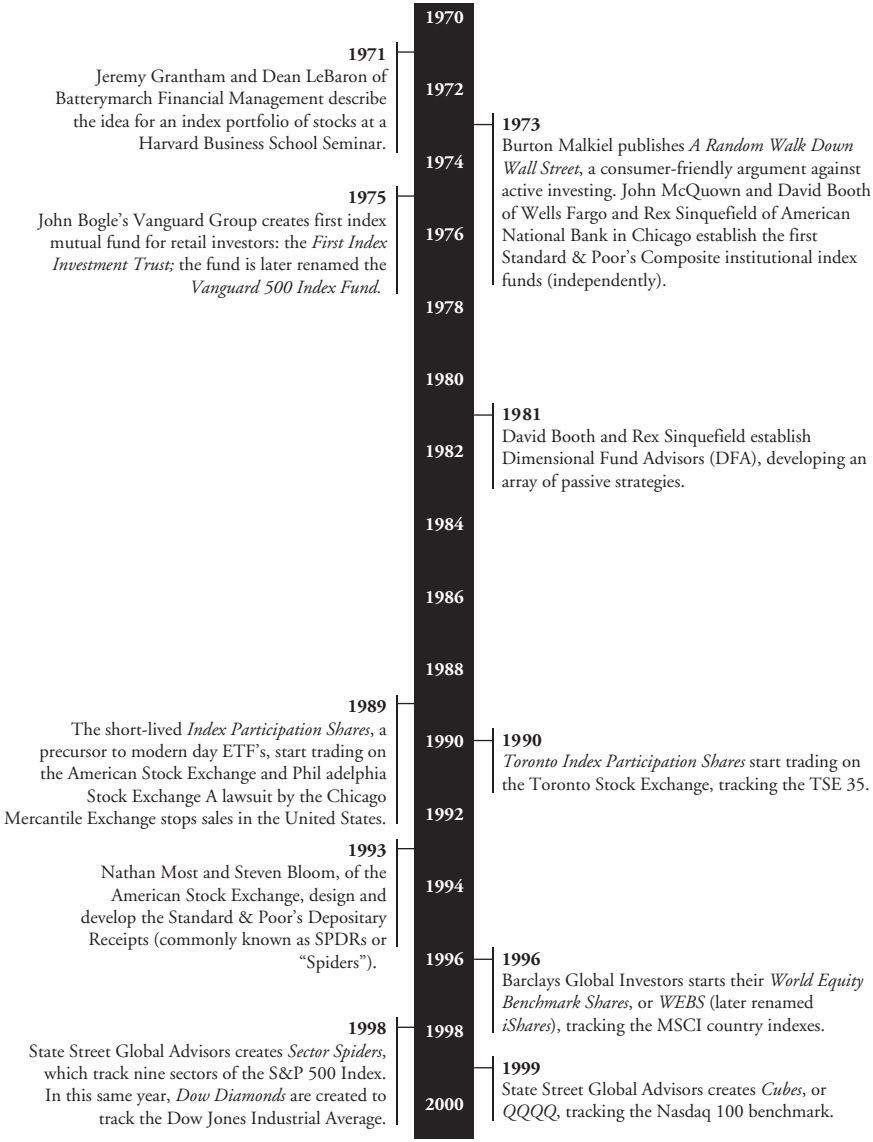
While index investing played a relatively minor role in most investors' (institutional and retail) portfolios in the 1970s, as we moved into the 1980s, a burgeoning movement began at a number of institutions. By the 1990s, with the advent of exchange-traded funds (ETFs), passive investments started to comprise a larger and larger percentage of both institutional and retail investment positions. An annotated history of passive investing in stock market indices is provided in Figure 1.1.

While most equity mutual funds remain actively managed, there is no question that passive strategies have grown quickly, and now constitute a material portion of the equity mutual fund universe. At the end of 2010, index mutual funds made up roughly 14.5 percent of total equity mutual fund assets, up more than 50 percent from a decade ago (see Figure 1.2). Within this group, the largest single index fund strategy is S&P 500 Index replication.

It's worth noting that in spite of significant net outflows from domestic equity mutual funds from 2007 to 2010, passive strategies continued to grow as a proportion of overall consumer portfolios. The Investment Company Institute data provided in Figure 1.2 is buttressed by Morningstar data that shows that passive strategies have grown from 11 percent of mutual fund and exchange-traded fund (ETF) assets in 1999 to 22 percent of assets at year-end, 2009.[5] ETF assets are very much in vogue at the present time, and have been accumulating assets at a solid pace for a number of years. No examination of the fund industry would be complete without considering the growth of this important new investment channel. As a large proportion of ETFs are passive strategies (including the ubiquitous SPDR trust, an S&P 500 Index fund), the growth of this investment option is disproportionately adding to the fraction of investments going into passive strategies as a whole.

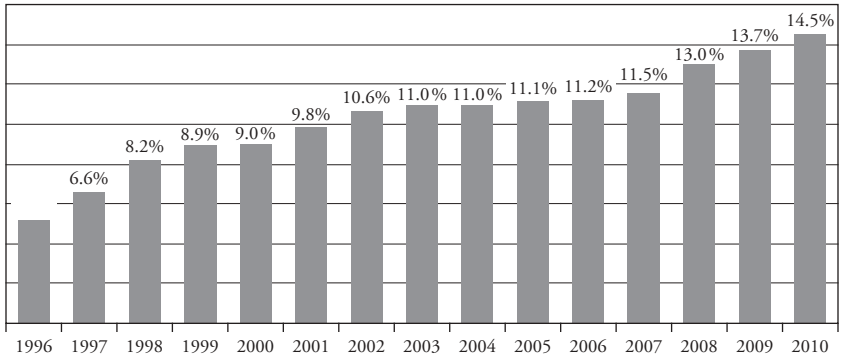
This, however, only tells part of the story. The growth in indexed institutional assets has certainly eclipsed the growth of indexed retail assets, resulting in an even larger percentage of total institutional assets being invested in passive strategies. Indeed, the Council of Institutional Investors, in its annual Asset Allocation Survey, reported the passive strategy breakdown for various

**FIGURE 1.1** The History of Passive Investing in Market Indices




*Sources:* Richard A. Ferri, *All About Index Funds: The Easy Way to Get Started,* 2nd ed. (New York: McGraw-Hill, 2007); Frank J. Fabozzi, *The Handbook of Financial Instruments* (Hoboken, NJ: John Wiley & Sons, 2002); Eric Falkenstein, *Finding Alpha: The Search for Alpha When Risk and Return Break Down* (Hoboken, NJ: John Wiley & Sons, 2009).

**FIGURE 1.2** Equity Index Funds' Share of Equity Mutual Fund Assets




*Source:* Investment Company Institute, 2011 Investment Company Factbook.

asset classes for 59 large corporate, foundation, public, and union pension fund members, representing more than $1.5 trillion in assets. This survey, heavily tilted towards large public plan sponsors, provides a relatively clear view of the extent of passive management in domestic equities. Table 1.5 provides a breakdown of the survey's results by broad asset class and plan sponsor.

The public pension fund group, including the asset allocation input of such industry heavyweights as the California Public Employees' Retirement System, the California State Teachers' Retirement System, the Florida State Board of Administration, and the Texas Teacher Retirement System, indexed 52.3 percent of their domestic equity assets in 2010. For the larger group, 47.6 percent of domestic equity assets were held in passive strategies.

**TABLE 1.5** Percentage of Asset Categories Passively Managed (2010)

| | Corporate | Public | Union | All Funds |
|---|---|---|---|---|
| Total Portfolio | 24.4% | 26.0% | 17.9% | **24.5%** |
| Domestic Equity | 41.0 | 52.3 | 33.3 | **47.6** |
| Global/Int'l Equity | 35.5 | 29.2 | 10.5 | **27.7** |
| Emerging Markets Equity | 16.7 | 11.8 | 50.0 | **14.6** |
| Domestic Fixed Income | 19.6 | 19.5 | 6.0 | **17.4** |
| Global/Int'l Fixed Income | n/a | 7.5 | n/a | **6.8** |

*Source:* Council of Institutional Investors, Asset Allocation Survey 2010.

Moreover, the types of passive investments are likely fairly uniform. It would not be outlandish to presume that the vast majority of passive domestic equity investments are focused on mid- to large-cap stock strategies such as the S&P 500 Index. Indeed, the Investment Company Institute (ICI) notes that at the end of 2010, 37 percent of index fund investments (including fixed income and hybrid funds) were indexed to the S&P 500 Index specifically, while another 32 percent were indexed to "Other Domestic Equity." In this context, other domestic equity likely includes both other domestic mid- to large-cap benchmarks, such as the Russell 1000 Index, as well as even broader benchmarks with heavy weights in mid- to large-cap stocks, such as the Russell 3000 Index and the Wilshire 5000 Index.

In short, there is no question that passive strategies are an increasing proportion of the equity holdings of various types of investors. It's also likely that the vast majority of these assets are focused on U.S. mid- to large-cap benchmarks.

## Defining Active Management

Of course, not all mutual funds and investment strategies are created equal. Money managers are generally a less-than-courageous lot, and indeed, their portfolios reflect this. While it's true that the majority of domestic mid- to large-cap mutual funds are active funds, one's definition of active can be tested when examining their underlying strategies and holdings.

This is the world of the *closet indexer*, or alternatively the "benchmark aware" portfolio. These portfolios have $R^2$ (r-squared) statistics that are relatively high, and they track very closely to their benchmarks. A fund's $R^2$ to its benchmark (such as the S&P 500 Index) measures the percentage of the fund's movement that can be explained by the benchmark. The higher the $R^2$ percentage for a given fund, the more the performance is explained by the index. For example, the $R^2$ for a fund such as the Vanguard 500 Index Investor Fund (VFINX) is 100 percent: 100 percent of VFINX is explained by the benchmark (which in this case is obviously the S&P 500 Index). However, VFINX is explicit in its advertisements—it is an index fund; it's not actively managed. So those who purchase VFINX are neither surprised nor disappointed by the fact that it looks and behaves like the index (although it should be noted that VFINX will always perform worse than the benchmark due to the fund's operating expenses). In addition, with

an expense ratio 0.17 percent, the owner of VFINX is not paying much for this strategy.

What is a high $R^2$? Jeff Ptak, a senior analyst at Morningstar, noted that any "fund with an $R^2$ of 95 or above raises eyebrows as a potential index hugger."[6] Attaining $R^2$ information is rather easy, as firms such as Morningstar report this information in profiles of risk.

An alternative approach to examining active management, proposed by Martijn Cremers of Yale University and Antti Petajisto of the University of New York,[7] seeks to determine what percentage of a manager's portfolio is actively managed by examining the underlying holdings in relation to an appropriate benchmark. In short, the case that Cremers and Petajisto make is that mutual funds can differ significantly in goals and objectives—even equity funds. As a consequence, looking at them as a group might do investors an injustice.

Using a measure they've devised called "Active Share," Cremers and Petajisto calculate the differences in holding weights (with 0 percent being a weighting) between a fund's portfolio and a benchmark, such as the S&P 500 Index. They define Active Share as the "fraction of the portfolio that is different from the benchmark index."[8] More specifically, Cremers and Petajisto sum the absolute value of the difference between the weighting of the stock within a given fund ($w_{\text{fund,i}}$) and the weighting of the same stock within the benchmark portfolio ($w_{\text{index,i}}$). The authors then take the resulting summation and divide the figure by 2 in order to arrive at the fund's Active Share. The formula for this calculation is provided in Equation (1.2).

$$\text{Active Share} = \frac{1}{2}\sum_{i=1}^{N}\left| w_{fund,i} - w_{index,i}\right| \qquad 1.2$$

Not a very daunting computation, Active Share is simply the sum of the absolute values of the differences between the holding weights for the fund, and holding weights within the index. Examining four equal-weighted portfolios of different sizes and compositions can give us a better feel for how portfolio size and market-cap composition (proportion of stocks that are in the largest stocks) impacts Active Share, and the computation of this metric. For example, Tables 1.6, 1.7, and 1.8, provide Active Share calculations for portfolios with 50 stocks, 30 stocks, and 10 stocks. Looking at these tables, one can get a better sense of how Active Share is calculated relative to the S&P 500 Index.

**TABLE 1.6** 50-Stock Portfolio vs. S&P 500 Index—Largest Issues

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| ExxonMobil Corp. | 2.00% | 3.56% | –1.56% | 1.56% |
| Apple Inc. | 2.00 | 3.30 | –1.30 | 1.30 |
| IBM | 2.00 | 1.90 | 0.10 | 0.10 |
| Chevron Corp. | 2.00 | 1.86 | 0.14 | 0.14 |
| Microsoft Corp. | 2.00 | 1.70 | 0.30 | 0.30 |
| General Electric Company | 2.00 | 1.66 | 0.34 | 0.34 |
| Procter & Gamble Co. | 2.00 | 1.61 | 0.39 | 0.39 |
| Johnson & Johnson | 2.00 | 1.57 | 0.53 | 0.53 |
| AT&T | 2.00 | 1.57 | 0.53 | 0.53 |
| Pfizer Inc. | 2.00 | 1.46 | 0.54 | 0.54 |
| Google Inc. | 2.00 | 1.43 | 0.57 | 0.57 |
| Coca-Cola Company | 2.00 | 1.39 | 0.61 | 0.61 |
| Wells Fargo & Co. | 2.00 | 1.27 | 0.73 | 0.73 |
| Philip Morris Int'l Inc. | 2.00 | 1.19 | 0.81 | 0.81 |
| Berkshire Hathaway Inc. | 2.00 | 1.18 | 0.82 | 0.82 |
| J. P. Morgan Chase & Co. | 2.00 | 1.11 | 0.89 | 0.89 |
| Intel Corp. | 2.00 | 1.08 | 0.92 | 0.92 |
| Merck & Company | 2.00 | 1.01 | 0.99 | 0.99 |
| Verizon Communications | 2.00 | 1.00 | 1.00 | 1.00 |
| Wal-Mart Stores Inc. | 2.00 | 0.91 | 1.09 | 1.09 |
| Pepsico Inc. | 2.00 | 0.91 | 1.09 | 1.09 |
| McDonald's Corp. | 2.00 | 0.90 | 1.10 | 1.10 |
| Oracle Corp. | 2.00 | 0.88 | 1.12 | 1.12 |
| Cisco Systems Inc. | 2.00 | 0.85 | 1.15 | 1.15 |
| ConocoPhillips | 2.00 | 0.85 | 1.15 | 1.15 |
| Qualcomm Inc. | 2.00 | 0.81 | 1.19 | 1.19 |
| Schlumberger Ltd. | 2.00 | 0.80 | 1.20 | 1.20 |
| Abbott Laboratories | 2.00 | 0.77 | 1.23 | 1.23 |
| Citigroup Inc. | 2.00 | 0.67 | 1.33 | 1.33 |
| Occidental Petroleum | 2.00 | 0.67 | 1.33 | 1.33 |
| United Parcel Service Inc. | 2.00 | 0.62 | 1.38 | 1.38 |
| Walt Disney Company | 2.00 | 0.59 | 1.41 | 1.41 |
| United Technologies Corp. | 2.00 | 0.58 | 1.42 | 1.42 |

(*continued*)

**TABLE 1.6** (*Continued*)

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| Kraft Foods Inc. | 2.00 | 0.58 | 1.42 | 1.42 |
| Home Depot Inc. | 2.00 | 0.57 | 1.43 | 1.43 |
| Comcast Corp. | 2.00 | 0.57 | 1.43 | 1.43 |
| Amazon | 2.00 | 0.55 | 1.45 | 1.45 |
| Altria Group Inc. | 2.00 | 0.53 | 1.47 | 1.47 |
| Bristol-Myers Squibb | 2.00 | 0.52 | 1.48 | 1.48 |
| Caterpillar Inc. | 2.00 | 0.51 | 1.49 | 1.49 |
| 3M Company | 2.00 | 0.50 | 1.50 | 1.50 |
| Bank of America Corp. | 2.00 | 0.49 | 1.51 | 1.51 |
| Boeing Company | 2.00 | 0.48 | 1.52 | 1.52 |
| UnitedHealth Group Inc. | 2.00 | 0.47 | 1.53 | 1.53 |
| CVS Caremark Corp. | 2.00 | 0.47 | 1.53 | 1.53 |
| Visa Inc. | 2.00 | 0.45 | 1.55 | 1.55 |
| U. S. Bancorp | 2.00 | 0.45 | 1.55 | 1.55 |
| Hewlett Packard Co. | 2.00 | 0.45 | 1.55 | 1.55 |
| Union Pacific Corp. | 2.00 | 0.45 | 1.55 | 1.55 |
| Amgen Inc. | 2.00 | 0.45 | 1.55 | 1.55 |
| All other S&P 500 stocks | 0.00 | 49.85 | –49.85 | 49.85 |
| Sum | 100.00 | 100.00 | 0.00 | 105.42 |
| | **105.42 / 2 = Active Share =** | | | **52.71%** |

*Index Source:* Position weights for the S&P 500 Index are based on security weights within the iShares S&P 500 Index Fund (IVV), an exchange traded index fund as of December 30, 2011.

**TABLE 1.7** 30-Stock Portfolio vs. S&P 500 Index—Largest Issues

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| ExxonMobil Corp. | 3.33 | 3.56% | –0.23% | 0.23% |
| Apple Inc. | 3.33 | 3.30 | 0.03 | 0.03 |
| IBM | 3.33 | 1.90 | 1.43 | 1.43 |
| Chevron Corp. | 3.33 | 1.86 | 1.48 | 1.48 |
| Microsoft Corp. | 3.33 | 1.70 | 1.63 | 1.63 |
| General Electric Company | 3.33 | 1.66 | 1.68 | 1.68 |
| Procter & Gamble Co. | 3.33 | 1.61 | 1.72 | 1.72 |
| Johnson & Johnson | 3.33 | 1.57 | 1.76 | 1.76 |

**TABLE 1.7** (*Continued*)

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| AT&T | 3.33 | 1.57 | 1.76 | 1.76 |
| Pfizer Inc. | 3.33 | 1.46 | 1.88 | 1.88 |
| Google Inc. | 3.33 | 1.43 | 1.90 | 1.90 |
| Coca-Cola Company | 3.33 | 1.39 | 1.94 | 1.94 |
| Wells Fargo & Co. | 3.33 | 1.27 | 2.06 | 2.06 |
| Philip Morris Int'l Inc. | 3.33 | 1.19 | 2.14 | 2.14 |
| Berkshire Hathaway Inc. | 3.33 | 1.18 | 2.16 | 2.16 |
| J. P. Morgan Chase & Co. | 3.33 | 1.11 | 2.23 | 2.23 |
| Intel Corp. | 3.33 | 1.08 | 2.25 | 2.25 |
| Merck & Company | 3.33 | 1.01 | 2.33 | 2.33 |
| Verizon Communications | 3.33 | 1.00 | 2.34 | 2.34 |
| Wal-Mart Stores Inc. | 3.33 | 0.91 | 2.42 | 2.42 |
| Pepsico Inc. | 3.33 | 0.91 | 2.42 | 2.42 |
| McDonald's Corp. | 3.33 | 0.90 | 2.43 | 2.43 |
| Oracle Corp. | 3.33 | 0.88 | 2.45 | 2.45 |
| Cisco Systems Inc. | 3.33 | 0.85 | 2.48 | 2.48 |
| ConocoPhillips | 3.33 | 0.85 | 2.49 | 2.49 |
| Qualcomm Inc. | 3.33 | 0.81 | 2.53 | 2.53 |
| Schlumberger Ltd. | 3.33 | 0.80 | 2.53 | 2.53 |
| Abbott Laboratories | 3.33 | 0.77 | 2.57 | 2.57 |
| Citigroup Inc. | 3.33 | 0.67 | 2.66 | 2.66 |
| Occidental Petroleum | 3.33 | 0.67 | 2.67 | 2.67 |
| All other S&P 500 stocks | 0.00 | 60.14 | -60.14 | 60.1488 |
| Sum | 100.00 | 100.00 | 0.00 | 120.73 |
| | **120.73 / 2 = Active Share =** | | | **60.36** |

*Index Source:* Position weights for the S&P 500 Index are based on security weights within the iShares S&P 500 Index Fund (IVV), an exchange traded index fund as of December 30, 2011.

The method by which I've structured these examples is fairly intuitive. For purposes of uniformity and to see the difference that different numbers of issues within a portfolio can make on active share, I've purposely selected the largest issues, by market-cap, for each of the three examples. One could also view this as a worst-case Active Share number. In other words, a 50-stock,

**TABLE 1.8** 10-Stock Portfolio vs. S&P 500 Index—Largest Issues

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| ExxonMobil Corp. | 10.00 | 3.56% | 6.44% | 6.44% |
| Apple Inc. | 10.00 | 3.30 | 6.70 | 6.70 |
| IBM | 10.00 | 1.90 | 8.10 | 8.10 |
| Chevron Corp. | 10.00 | 1.86 | 8.14 | 8.14 |
| Microsoft Corp. | 10.00 | 1.70 | 8.30 | 8.30 |
| General Electric Company | 10.00 | 1.66 | 8.34 | 8.34 |
| Procter & Gamble Co. | 10.00 | 1.61 | 8.39 | 8.39 |
| Johnson & Johnson | 10.00 | 1.57 | 8.43 | 8.43 |
| AT&T | 10.00 | 1.57 | 8.43 | 8.43 |
| Pfizer Inc. | 10.00 | 1.46 | 8.54 | 8.54 |
| All other S&P 500 stocks | 0.00 | 79.82 | –79.82 | 79.82 |
| Sum | 100.00 | 100.00 | 0.00 | 159.64 |
| | **159.64 / 2 = Active Share =** | | | **79.82** |

*Index Source:* Position weights for the S&P 500 Index are based on security weights within the iShares S&P 500 Index Fund (IVV), an exchange traded index fund as of December 30, 2011.

30-stock and 10-stock portfolio of any design, selecting stocks from a universe of S&P 500 Index stocks, can never have less Active Share than the portfolios I've chosen here.

To make this more concrete, consider a portfolio of the 50 smallest stocks in the S&P 500 in terms of market-capitalization. In this case, if one is selecting a 50-stock portfolio and choosing only stocks from within the S&P 500 Index, one would not be able to attain a higher Active Share than what this portfolio (of smaller S&P 500 Index issues) provides. This portfolio, with positions of equal weight, would have an Active Share of 98.88 percent, as shown in Table 1.9.

Given the range of individual stock weightings within the S&P 500 Index, from as much as 3.56 percent for ExxonMobil Corp. to as little as 0.0001 percent for Orchard Supply Harware, the manager who selects securities from this universe could, if they are unconstrained in their selection process, sometimes look very benchmark-like, and other times look very active (with very high Active Share). There is, however, a trade-off to selecting stocks from the bottom quintile or bottom quarter or even bottom half of a market capitalization–weighted universe: one will have high active share, but the price will be unrepresented exposure to the benchmark. Is this a negative?

**TABLE 1.9** 50 Stock Portfolio vs. S&P 500 Index—Smallest Issues

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| LSI Corp. | 2.00% | 0.03% | 1.97% | 1.97% |
| Gamestop Corp. | 2.00 | 0.03 | 1.97 | 1.97 |
| Sealed Air Corp. | 2.00 | 0.03 | 1.97 | 1.97 |
| Tesoro Corp. | 2.00 | 0.03 | 1.97 | 1.97 |
| Hudson City Bancorp Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Molex Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Leggett & Platt Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Genworth Financial Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Owens-Illinois Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Advanced Micro Devices | 2.00 | 0.03 | 1.97 | 1.97 |
| Gannett Company | 2.00 | 0.03 | 1.97 | 1.97 |
| Lennar Corp. | 2.00 | 0.03 | 1.97 | 1.97 |
| Total System Services, Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Cablevision Systems | 2.00 | 0.03 | 1.97 | 1.97 |
| NASDAQ OMX Group | 2.00 | 0.03 | 1.97 | 1.97 |
| Bemis Company | 2.00 | 0.03 | 1.97 | 1.97 |
| Urban Outfitters Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Avery Dennison Corp. | 2.00 | 0.03 | 1.97 | 1.97 |
| Zions Bancorp. | 2.00 | 0.03 | 1.97 | 1.97 |
| Legg Mason Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Snap-On Inc. | 2.00 | 0.03 | 1.97 | 1.97 |
| Apartment Invest. & Mgmt. | 2.00 | 0.02 | 1.98 | 1.98 |
| Novellus Systems Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Expedia Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Ryder System, Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| R. R. Donnelley & Sons | 2.00 | 0.02 | 1.98 | 1.98 |
| Harman International | 2.00 | 0.02 | 1.98 | 1.98 |
| Patterson Companies Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| MetroPCS Comm. | 2.00 | 0.02 | 1.98 | 1.98 |
| Teradyne Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Big Lots Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Tripadvisor Inc. | 2.00 | 0.02 | 1.98 | 1.98 |

(*continued*)

**TABLE 1.9** (*Continued*)

| | Fund Weight | Index Weight | Difference | Absolute Value |
|---|---|---|---|---|
| JDS Uniphase Corp. | 2.00 | 0.02 | 1.98 | 1.98 |
| Lexmark International | 2.00 | 0.02 | 1.98 | 1.98 |
| DeVry Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| PerkinElmer Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Tenet Healthcare Corp. | 2.00 | 0.02 | 1.98 | 1.98 |
| Pulte Group Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| First Horizon National | 2.00 | 0.02 | 1.98 | 1.98 |
| Dean Foods Company | 2.00 | 0.02 | 1.98 | 1.98 |
| E*Trade Financial Corp. | 2.00 | 0.02 | 1.98 | 1.98 |
| First Solar Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Washington Post Company | 2.00 | 0.02 | 1.98 | 1.98 |
| Compuware Corp. | 2.00 | 0.02 | 1.98 | 1.98 |
| AutoNation Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| SUPERVALU Inc. | 2.00 | 0.02 | 1.98 | 1.98 |
| Federated Investors, Inc. | 2.00 | 0.01 | 1.99 | 1.99 |
| Titanium Metals Corp. | 2.00 | 0.01 | 1.99 | 1.99 |
| Sears Holdings Corp. | 2.00 | 0.01 | 1.99 | 1.99 |
| Orchard Supply Hardware | 2.00 | 0.00 | 2.00 | 2.00 |
| All other S&P 500 stocks | 0.00 | 98.88 | -98.88 | 98.88 |
| Sum | 100.00 | 100.00 | 0.00 | 197.75 |
| | **197.75 / 2 = Active Share =** | | | **98.88%** |

*Index Source:* Position weights for the S&P 500 Index are based on security weights within the iShares S&P 500 Index Fund (IVV), an exchange traded index fund as of December 30, 2011.

One could make the argument that it's not, as the manager's duty should be to add alpha (from a CAPM standpoint) rather than beta. Beta can always be attained by just selecting an index fund to pair with an active manager—and indeed, some institutions use this method in managing their overall exposures. Moreover, a manager, when unconstrained would presumably be purchasing "best ideas," and from a value orientation, the safest stocks (as they have the greatest margin of safety).

However, if the selection process is continually biased to smaller issues in the benchmark, one could, I believe, also make the case that such a manager

is not giving an individual or institution a sufficient amount of exposure to the underlying asset class to be deemed an appropriate representation of the exposure. Keep in mind that asset allocation determinations are based on benchmark-representative asset class exposures. Thus, the risk and return data (which is essentially beta)—which one could argue is messy from an expectation standpoint as it is—will represent a different pool of assets than that being experienced in such a strategy. In such cases, pairing a manager like this with a passive strategy may be a good option, in order to have at least some representation to the asset class, as it's represented in the asset allocation study.

From these various examples, one can see that market-cap and portfolio size are drivers of Active Share, and when they combine one is going to essentially become very index like, with Active Share of well under 60 percent.

From this perspective, an index fund, such as VFINX, has less than 20 percent Active Share, while a closet index fund, or one that essentially refuses to deviate from the benchmark in a material manner, will have Active Share of only 20 percent to 60 percent. Consider, for example, a fund with Active Share of 50 percent. Such a fund is essentially a cross between a passive fund and an active fund, holding 50 percent of its assets in the same relative weights as the benchmark. Even Cremers and Petijisto note that it's "very hard to see how an active fund could justify investing in more than half of all stocks, because regardless of the managers' beliefs on individual stocks, he must know that no more than half of all stocks can beat the market."[9]

In an examination of mutual fund active share in the 1990s Cremers and Petajisto found that while the "fraction of pure index funds grew substantially . . . from about 1% to 15% . . . the fraction of closet indexers increased even more significantly." While there were virtually no closet indexers in the 1980s, the authors estimate that roughly 30 percent of all mutual fund assets where in low Active Share funds in 2003.

Cremers and Petajisto have also taken a much more nuanced view of mutual funds, dividing them up and examining them relative to 19 different passive benchmarks—as opposed to simply selecting one benchmark for comparison purposes.

Since William Sharpe's influential work on mutual fund performance in 1966,[10] there have been a number of studies seeking to determine the efficacy of active management. Sharpe's work, examining performance on a risk-adjusted and absolute basis versus the Dow Jones Industrial Average for the period 1954 to 1963, concluded that "all other things being equal, the smaller a fund's expense ratio, the better the results obtained by its stockholders." Hardly surprising, as it seems a foregone conclusion that when all else is held equal, lower expenses are going to result in higher returns. Still, this

sentiment that harkens back almost 50 years retains much value in the eyes of many. Indeed, just last year, John Bogle in an op-ed for the *Wall Street Journal* cited this very line.[11]

Whether mutual funds add value, contrary to what's indicated in Mr. Bogle's argument in the *Wall Street Journal*, is hardly a settled issue. Sharpe's work indicates that funds do not add value, as does Jensen's,[12] Carhart's,[13] and others. Alternatively, work by Grinblatt and Titman,[14] Wermers,[15] Hendreicks, Patel and Zeckhauser,[16] and others indicate that there is value to active management.

At the end of the day, the value of active management is difficult to determine, and performance is not as clear-cut as it would seem. What is an appropriate time period? Should mutual funds be grouped into subsets to be examined in relation to peers and appropriate benchmarks? Is it fair to examine managers versus benchmarks that do not accurately reflect the universe from which they select securities? All of these questions and the subsequent answers matter. It is extraordinarily easy to construct a group of funds and show efficacy in active management or lack of efficacy. But this likely does the investor no good in the end.

In short, aggregated mutual fund performance, in relation to a broad market benchmark, tells us very little. Moreover, it fails to reveal whether exploitable opportunities are present in the large-cap subset of the investing universe. However, taking a more nuanced approach to fund evaluation, and understanding the trends that are shaping the large-cap subset of the market does provide insights into future opportunities and points us towards portfolio constructs that can add value.

This brings me back to the work by Cremers and Petajisto. If we determine that a large proportion of all domestic equity mutual funds are either index funds or closet index funds, then our average returns for this group will reflect this composition.

We know that between 15 percent and 20 percent of equity mutual fund assets are invested explicitly in index funds. Work by Cremers and Petajisto indicates that approximately 30 percent of fund assets would be characterized as low Active Share funds—a charitable description, as a more appropriate description would be closet index funds. Thus, on the whole, between 45 percent and 50 percent of equity mutual fund assets are either passive or quasi-passive funds. This is, however, a moving estimate, with funds becoming more active as a result of strategy and investment selection from time to time, rather than a determination to veer from a riskier investment posture. As the 30-stock example previously cited in Table 1.7 shows, even a portfolio of 30 stocks can look like a closet index fund, if the 30 stocks chosen are

chosen from amongst the largest of the universe examined. It is surprising that even with a 30-stock portfolio, one is on the lower bound of what we would consider active, using Active Share. Is this a likely portfolio positioning? Probably not. But it is something to consider in using a metric like Active Share.

Still, our own investment strategy at Jones Villalta Asset Management finds, at the present time, significant value in the *mega-cap*, upper echelons of the capitalization spectrum and our portfolio reflects this preference, holding many of the largest companies domiciled in the United States. But, even with this heavy *mega-cap* bias at present, our own active share is approximately 76 percent, placing us comfortably in the *active* second quintile of Petajisto's range. In truth, while some of the increase in the proportion of what we would consider *closet index funds* (especially in the value subset of the market) could come as a result of where the values are at present, a manager would really need to work to fall into this camp. Given our firm's experience, this is likely a minor amount.

Antti Petajisto, in a follow-up to his work with Cremers, examined mutual funds between 1980 and 2009, using the fund's stated primary benchmark for Active Share computation purposes. He then grouped his results into Active Share quintiles, as shown in Table 1.10.

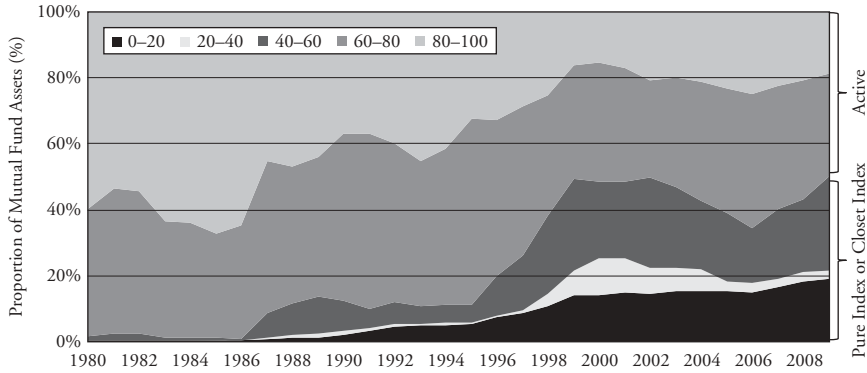
In examining these quintiles over time, Petajisto not only found that the use of explicit passive strategies, such as index funds, was increasing over the past 30 years, but the use of closet index funds was increasing at an even greater rate over this time period. Figure 1.3 provides a history of the evolution of active share from 1980 to 2009.

From a performance perspective this is something to think about. Consider, for example, an alternate universe where there are only five mutual funds: two of them explicitly S&P 500 Index funds and three of them closet index funds mimicking the S&P 500 benchmark. All such funds would underperform the benchmark over the long-term, in an amount equal to

**TABLE 1.10** Defining Active Versus Passive Active Share

| Quintile | Active Share | Classification |
|---|---|---|
| 1 | 0%–20% | Pure Index |
| 2 | 20%–40% | Closet Indexer |
| 3 | 40%–60% | |
| 4 | 60%–80% | Truly Active Managers |
| 5 | 80%–100% | |

**FIGURE 1.3** Evolution of Active Share: 1980–2009




*Data Source:* Antti Petajisto, "Active Share and Mutual Fund Performance," Working Paper, December 15, 2010.

their fees. Fully, 100 percent of the funds. Now consider that one of these funds is truly actively managed (with high Active Share, rather than low Active Share), or even two of these funds. If we say that two of the five funds are actively managed, then those two funds not only have to create value over the particular time period, but they would need to create sufficient value to make up for the assured loss that will be taken (relative to the benchmark) at the other three funds. In the end, considering the proportion of funds that are explicitly passive in conjunction with the proportion that are essentially passive (the low Active Share funds), it's surprising that the average fund does not underperform the market to a greater degree than is indicated in the literature. In the end, Cremers and Petajisto find that funds "with the highest Active Share outperform their benchmarks both before and after expenses, while funds with the lowest Active Share underperform after expenses."[17] Moreover, the authors "find strong evidence for performance persistence for the funds with the highest Active Share."

My takeaway is not really that truly actively managed funds outperform their benchmarks; it's that the space, the domestic mid- to large-cap space in the mutual fund industry, has morphed into an exercise in mediocrity. The real take-away is that more than ever, investors are, like it or not, increasingly invested in passive index strategies (either explicitly or implicitly).

James Montier put this more eloquently when he noted that it "may still be right to argue that the majority of investors are best off in index funds, but not because the market is efficient, but rather because it is full of passive funds masquerading as active funds."[18]

## So What Does This Mean for Investors?

Outside of the performance disparity described above, there is an element to passive investing trends that would seem to undermine market efficiency. Theoretically, the more investors relegate money to passive strategies, the more volatile we can expect markets to become.[19] When the pool of investors is not simply a pool of naïve irrational actors and sophisticated investors, but also includes passive investors, the pricing for securities that are included in passive portfolios become increasingly inelastic. As passive investors do not buy or sell based upon the irrational actions of others, the greater the passive investors' overall proportion of the market, the greater the impact that irrational market participants will have on the volatility of underlying security prices.[20] Note that this tendency is not predicated on market capitalization, but on the fraction of the overall market invested in passive investments. As was explained earlier in this chapter, passive investing is a growing trend, and is likely an even greater proportion of the large-cap investing universe. Theoretically, the passive investing trends described previously, would seem to create opportunities in the large-cap subset of the market for those who seek to exploit market inefficiencies.

Moreover, in practical terms, an intuitive argument can be made that the less active money available to monitor and react to public information, the more likely it is that markets will become increasingly inefficient. The move toward passive investments incrementally cedes money from the hands of actionable investors, who would be inclined to sell overvalued stocks and invest in undervalued stocks, to strategies that are agnostic on such matters. Does this influence markets? Ingo Fender of the Bank for International Settlements believes as much, noting that "industry trends . . . seem to suggest that the ability of institutional investors to engage in risky arbitrage strategies might have been reduced."[21] This, of course, is not to say that pricing errors are not rectified, but just that it is more difficult to do so. For investors, this could be seen as an opportunity, but one that requires patience. I'm not alone in this view. In a survey of 237 asset managers, pension plans, pension consultants and fund distributors from 29 countries, Amin Rajan of CREATE-Research concludes that passive investments will "attract huge inflows: up to 55% of new fund flows by 2019."[22] However, as Fender at the Bank of International Settlements notes, such advances do not come without problematic side effects. Rajan concedes that this trend likely will lead to pricing anomalies, but that this could also create opportunities for active managers who seek to profit from the dislocations.

In short, while there is certainly room for further research on this matter, there is no question, that there is a movement under way. This movement away from actively managed funds and portfolios likely has ramifications, as the proportion of investments becomes less engaged in evaluating companies to any degree. Investors have traditionally had two voices in the management of companies:

1. They can sell their shares, and voice their dissatisfaction by action.
2. They can vote their shares in a manner that reflects satisfaction or dissatisfaction.

Clearly, an increasingly passive investment environment, characterized by either outright index funds or closet index funds, renders the first of these voices mute. Moreover, one should also keep in mind that for larger institutions, evaluation of business strategy and underlying management efficacy is less than easy. Indeed, the Organization for Economic Co-Operation and Development noted as much in a 2007 report, explaining that:

> when markets are not perfect but characterized by information asymmetries and costs of collective action, managements might pursue their own goals and interests rather than those in the best interest of the company and its shareholders. In these circumstances, there is an important role for "active" investors with incentives to invest in both acquiring and using information. Capital markets around the world are, however, increasingly dominated by institutional investors that often adopt passive investment strategies. These strategies include index-tracking rather than stock picking.[23]

While at first glance this may strike some as hyperbole, it's not difficult to think of circumstances where one wonder's at management's aloofness. Moreover, often it's easy to question one's impact from a proxy-voting standpoint, when one owns a few thousand shares or even a few hundred thousand shares out of a billion. In truth, the passive nature of investments at this stage is likely not the culprit when it comes to sleuthing out the reasons for general investor apathy. Over time, however, one could reasonably expect that as the proportion of passive investors increases, it would inhibit the effects of the first voice cited above: selling shares, or voting with one's actions.

Recently, noted value investor Bruce Berkowitz, through his Fairholme Fund, has been engaged in a battle to gain control of St. Joe Company (JOE). Ostensibly, Fairholme Fund's management believes that the management of St. Joe Company has been destroying value rather than creating it. JOE is

a real estate development company with several hundred thousand acres of land in Florida. While Fairholme's management does not dispute the difficult operating environment that JOE is enduring in the current real estate *bust*, they believe the company is doing too little to preserve value for when circumstances change and the real estate market improves. This would seem to be a classic case of a value investor, seeing value in a circumstance that requires patience, but also requires prudent management. We all look for investments where we can purchase assets at a discount to what we believe is a *true* value, but inevitably, we do rely on management to preserve that value, while prices in the market make their way to this *true* value. As I'll discuss in Chapter 6, one of the difficulties faced by those involved in *arbitrage-like* activities is the uncertainties present between the date at which one purchases a given stock, and intrinsic value is recognized in the market (even if the intrinsic value is a certainty). Management's actions in this uncertain period are obviously important. Consequently, after attempting to get management of JOE to change course and enact policies that are more investor friendly, the management of the Fairholme Fund, as one of JOE's largest shareholders, enacted a battle at the board level, and eventually took management control of JOE.

This is great, right? This is capitalism at work, and the benefit of active management. One would think that Berkowitz would be applauded as a fund manager. He's protecting the interests of his fund!

Well, not quite. A short time after Berkowitz took control of JOE, *Barron's* reported that investors had pulled over $300 million from the Fairholme Fund.[24] Also, in an ironic twist, prominent mutual fund consultant Barry Ritholz, the Chief Investment Officer of FusionIQ, eliminated the Fairholme Fund from his list of "best of breed" mutual funds. In so doing, he explained that the battle for JOE was "a huge distraction, and it is not why we selected Berkowitz's fund in the first place. It was easy to replace his value fund with the dividend SPX index (SDY), which cut the management fees to the investor by 60%."[25]

Ouch. He exercises one of the more important roles an investor has in maintaining the efficiency of our market-based system of ownership, only to be replaced by an investment that serves no such role. So much for corporate governance in the time of ETFs and index funds.

If, as Sharpe asserts, the reason that security prices are so efficiently priced is "not because security analysts are not doing their job properly, but because they are doing it very well,"[26] then what are we to make of an environment where security analysis matters less and less? A world in which passive strategies or quasi-passive strategies consume a significant portion or a majority of

the net fund flows going towards equities. It would seem logical, that truly active strategies would increasingly differentiate themselves. I'm not one to believe that the market ever attained a level of efficiency that Sharpe would likely assert. But, for those that share his view, the trends in passive strategy investment would seem to foster a reconsideration of the outlook for active management.

## Two Additional Considerations

There is another method to achieve very high active share, which is not commonly noted in research or mutual fund advertising—simply buy off-benchmark securities. In other words, if one benchmarks to the S&P 500 Index and buys even a modest number of large-cap foreign stocks, one's active share will rise. Still, in this case, it isn't true that the manager has high Active Share; it's more appropriate to acknowledge that the benchmark has simply been missspecified. A benchmark should encompass all of the opportunities available to a manager, and essentially be the manager's universe. Going off-benchmark, while not cheating per se, is misleading from both a performance-tracking standpoint as well as from an Active Share standpoint. I'll discuss off-benchmark securities and the importance of benchmarks to the active large-cap manager in Chapter 11.

Secondarily, for funds that are active yet track closely with a benchmark such as the S&P 500 Index, paying a fee of even 0.50 percent is rather egregious—and, I would note, gives active management a very bad name. In truth, for those concerned with benchmark relative risk (deviations from the benchmark), we would advise using an explicit index fund, or a combination of an explicit index fund and a truly active manager. By paying an active management fee for a closet indexer, one may, with luck, modestly outperform the benchmark in certain periods. However, over the long-term it's more likely that one's performance will be more akin to an index fund, less the active management fee. Not a good combination.

This would also hold for institutions or individuals that maintain equity portfolios with such strictures on their governance (high number of names in the portfolio, sector constraints, etc.) as to render them closet index strategies. What is the point? In these cases, while fees may not be an issue, why take the benchmark relative risk by using a strategy that essentially will give benchmark-like returns over the long term. It makes no sense from a management perspective, and is relatively easy and costless to remedy.

## Finally, Something Timely

Many of the trends and hypothesized outcomes described in this chapter are long-term in nature, and I suspect that they will not reverse course any time soon. Consequently, there is a real, long-term opportunity for those portfolio managers who understand from whence opportunity is derived, and have the intestinal fortitude to veer from benchmark positions.

To this end, the remainder of this book is devoted to two broad areas of thought:

1. In order to take advantage of opportunities in the large-cap subset of the market, we need to understand the conditions that create market opportunities. This requires that we understand the nature of uncertainty, the notion of efficient markets and alternative views of market inefficiency.
2. In order to capitalize on market inefficiencies, we must ensure that we are not falling victim to such inefficiencies, and we must enact measures to ensure that we are taking an objective view of both research analysis and portfolio management. The last four chapters of this book are devoted to these topics.

However, I would be remiss if I didn't address the current nature of the present environment and the market for large-cap stocks. From a market standpoint, excluding the benefit or shortfalls associated with an actively managed portfolio, there is appeal to large-cap stocks. The market over the past 10 years has been abysmal, which everyone knows. One needs look no further than benchmark returns for domestic stocks over various time periods (see Table 1.11) to see that market returns have been subpar, and large-cap returns have been even more disappointing.

Ibbotson Associates, in their annual yearbook for stocks, bonds, bills, and inflation, provides a return from the S&P 500 for the period 1926 to 2010 of 9.9 percent.[27] This return exceeds the annualized rate over the past 15 years by a wide margin- with the 15 year return being inclusive of the market bubble of the late 1990s. We could take a longer view of the market's performance by using a data series provided by Robert Shiller of Yale University.[28] Mr. Shiller's data spans the period 1871 to 2011, and provides a compound annual growth rate over this more than 130-year data set of 8.87 percent. While lower than the Ibbotson data, it is still significantly above the rate realized over the past 15 years.

The question, of course, is: what does the future hold? In short, while it's futile to expect that the recent past provides clues to the future, I do think

**TABLE 1.11** Index Returns, Annualized through December 31, 2011

| | 5 Years | 10 Years | 15 Years |
|---|---|---|---|
| Large-Cap Indexes | | | |
| S&P 500 Index | −0.25% | 2.92% | 5.45% |
| Russell Top 50 Index | −0.91 | 1.26 | N/A |
| Russell Top 200 Index | −0.56 | 2.06 | 4.80 |
| Russell 1000 Index | −0.02 | 3.34 | 5.68 |
| Mid-Cap Index | | | |
| Russell Midcap Index | 1.41 | 6.99 | 8.44 |
| Small-Cap Indexes | | | |
| Russell 2000 Index | 0.15 | 5.62 | 6.25 |
| Russell Microcap Index | −3.75 | 4.63 | N/A |

*Index Source:* Russell Investments (www.russell.com) and Robert Shiller compiled data.

there are a couple of points to be made with regard to the return data above. One, the past performance of a market benchmark or index should not be used as a guide for estimating future returns. Later in this book I'll explain a common behavioral flaw called representativeness bias. Representativeness bias describes a human tendency to take a small set of data or unrelated information and consider it representative of what to expect in the future. In short, it's very easy to look at the recent past in large-cap stocks and extrapolate that the future will provide similar returns. This would be a very grave error for investors to make.

Two, I would note that there is a body of evidence that points to a mean reverting tendency for broad market averages[29] as well as cross sections of the broad market.[30] Stocks appear to display negative serial correlation over longer time horizons, indicating that longer periods of below average performance are usually followed by periods of above average performance, and vice versa. Researchers who've examined this tendency point to investor behavior as the likely culprit. While time will tell if this is true of the current environment, unprecedented outflows from domestic equity mutual funds over the past five years would seem to support the assertion that investor behavior is decidedly pessimistic at the present time. Investment Company Institute data on mutual fund flows show significant outflows in 2007, 2008, 2009, 2010 and 2011, a string of outflows for domestic equity funds that has no historical precedent in ICI's compilation.

## Conclusions

This chapter is an important starting point for this book. I've defined what a large company is and provided a rationale for using market capitalization as a basis for this delineation. In addition, I've provided a historical perspective on the state of active management in the domestic stock market, noting the growth in passive investing and the emergence of closet indexing. While it is difficult to determine what the effects of these trends will be on the fair valuation of securities in the domestic stock market, I've offered my thoughts and the thoughts of others on logical extensions of these trends and the ramifications from a corporate governance perspective. Finally, while I don't believe that the case for large-cap active management is simply a near term opportunity, I do believe that the current environment is being shaped by an inordinate amount of pessimism. This would seem to set the stage for better returns in coming years.

As we move forward, with the intent to identify opportunities in large-cap stocks, it is important to understand the state of this subset of the market. The trends discussed previously should at the very least give investors pause in determining the array of assets they wish to hold and the proportion of assets that they invest in passive strategies. While I think it is evident that I see value in active management, I further see value in combining active strategies with passive ones.

While this chapter should give investors some background on investing trends and the large-cap investing landscape, the next chapter will offer a starting point in understanding how opportunities in large-cap stocks come about. The assessment of uncertainties proves to be one of the more problematic areas for professional and amateur investors. Understanding the difference between risk and uncertainty will hopefully provide insights that we can revisit in later chapters.

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# CHAPTER 2

# Risk and Uncertainty

As this book progresses, I'll talk increasingly about uncertainty. Uncertainty is the crux of all investments. Its estimation becomes the basis for valuation, and our approach to it becomes either our greatest advantage or our Achilles heel. Part II of this book will talk about market inefficiency, and the reader will find that the way individuals approach uncertainties will play an oversized role. Part III of this book will talk about investment analysis and portfolio management. Once again, our approach to uncertainties, as practitioners, will play an oversized role in our objective assessments of valuation.

In the context of investments, uncertainties abound. I'll note later in Part III that all of the numbers that we use in valuation are made up. The value of a common stock is not based on prior success or failure, but our expectations for the company's future cash flow generating ability. While the past may be the basis for our assessment of future success or failure, these assessments are uncertain. It is in this way that uncertainty is tied to risk, as the uncertain nature of valuation inputs makes common stocks volatile. Sometimes volatility is the upward movement of a stock's price, when an assessment of an uncertainty proves to be overly *pessimistic*, while at other times it is the downward movement, when an assessment has proven to be overly *optimistic*. Volatility is measurable, and as a consequence has become associated with investment risk. This chapter will focus on risk and its relationship to uncertainty.

Investment risk is a difficult concept to characterize. Standard measures of risk, reliant on historical or expected price volatility, prove less than reliable as indicators of what to expect in the future. However, unconventional thoughts on this topic are not articulated as well within financial and economic research, and prove difficult to incorporate into standard financial models. Famed investor Howard Marks has noted that he is often asked for

his secret to controlling risk. He explains that if he "had to identify a single key to consistently successful investing . . . it's 'cheapness.'"[1] Simply stated, when investments go up in value, they become riskier—all else remaining equal. This is largely axiomatically true. If something goes up in value, holding all else equal, it is riskier. Conversely, if something goes down in value (becomes cheaper), all else being equal, it is less risky. This may strike some as counterintuitive, as we are conditioned to view falling investment values as a negative—and indeed, investments falling in value would be a negative to the individuals holding them.

We equate the sense of loss in the value of our investments to the riskiness of the investment. This connection is not valid in many circumstances. If we think back to the telecommunications, media, and technology bubble of the late 1990s, we can see that with each upward movement in stock prices came a corresponding potential downward movement in a future time period (principally 2000 to 2002). Asset bubbles and market crashes are the ultimate embodiment of Marks's theory of cheapness and risk, but we can also see this notion exemplified in individual common stocks.

Take, for example, Intel Corporation's common stock, INTC. If we presume that there is a valid intrinsic value for INTC, then as we move past that value, the common stock becomes more likely to move back downward toward the intrinsic value. Indeed, INTC doesn't even need to ever trade above its intrinsic value to make this point valid. As common stocks are essentially valued based on uncertain assumptions, we never really can be 100 percent confident that we are correct in our intrinsic value calculation. Consequently, if INTC trades at a 20 percent discount to intrinsic value and moves higher to a price that equates to a 10 percent discount from intrinsic value, then INTC has become riskier. Why? One, there is uncertainty to our underlying assumptions. Two, as we see a shrinking of what Benjamin Graham refers to as the "margin of safety," our investment becomes riskier. These points are a reflection of the fact that we, as humans, often get caught up in the moment. Our thoughts turn overly joyous or overly gloomy. Our investments approach theoretical intrinsic values for fleeting moments, as we move around these values at the whim of whatever information is making us euphoric or concerned. In short, in this context, risk and investing is, in some respects, as simple as Mr. Marks makes it.

While Benjamin Graham's characterization of stock investment risk hinged on the notion of "margin of safety," he also viewed changes in business fundamentals as a part of evaluating the riskiness of a given company. In his classic bestseller, *The Intelligent Investor*, he noted that common stock investments "should not be termed 'risky' merely because of the element of price

fluctuation. But such risk is present if there is danger that the price may prove to have been clearly too high by intrinsic value standards. . . ."[2] This is largely in keeping with the notion of risk being related to the certainty or uncertainty of the underlying cash flows. In common stock valuation, risk should be related to the uncertainty of the underlying cash flows. However, whether the market is sufficiently adept at reflecting the uncertainty of cash flows on any given day, or in any given short-term period of time, is a different matter.

This book is not principally about risk. Nor is it about a strategy that should be employed to control risk. This book is principally about identifying opportunities in a universe of mid- to large-cap stocks and constructing portfolios of mid- to large-cap stocks. Theories underpinning market efficiency deal with the human approach to uncertainties in a very different manner from theories that assert markets are inefficient. As active stock selection strategies bow to characterizations of the market as inefficient, understanding uncertainty is vitally important to understanding investment valuation.

This chapter will start with a discussion of conventional notions of financial risk, standard deviation and beta. Next, I'll discuss the value in accounting measures of risk and how they are likely more relevant than financial measures in helping us determine the riskiness of future uncertainties. Finally, the chapter will end with a discussion of the difference between investments with certain cash flows and investments with uncertain cash flows, using the 2008–2009 financial crisis as a context for examining the link between price volatility and uncertainty. This discussion will not only give one a sensible (but less conventional) view of risk, but will also help one better understand uncertainties and their role in investment analysis and valuation.

## Financial Measures of Risk

As noted earlier, risk can be measured and defined in different ways, depending on one's perspective. Financial measures of risk tend to focus on the variability in the company's share price in relation to other stocks or the market. The two most common risk metrics used to measure volatility are standard deviation and beta. Standard deviation is an absolute measure of volatility, which requires context to determine its magnitude. Beta is a measure that reflects a company's variability in relation to the market's variability.

Standard deviation, a statistical measure of fluctuation around an average, can be calculated for either a stock or for a market index. In both cases, the calculation is the same. The standard deviation for a stock ($\sigma_{stock}$) is calculated by first calculating a variance for a time series and then taking the square-root

of the variance. Variance ($\sigma^2$) is calculated by first calculating a mean average ($R_a$) for the time series, and then summing the squared deviations of the returns ($R_{stock}$) and dividing this sum by the number of returns in the time series, less one ($n - 1$). The formula (2.1) used to calculate variance is:

$$\sigma^2_{stock} = \frac{\sum (R_{stock} - R_{average})^2}{(n-1)} \quad 2.1$$

Once we have a variance, we can then calculate the standard deviation, as provided in formula 2.2:

$$\sigma_{stock} = \sqrt{\sigma^2_{stock}} \quad 2.2$$

Importantly, the standard deviation of stock returns is backward looking and very time dependent. If one calculated the standard deviation of Dell Inc.'s (DELL) quarterly common stock returns over the 20 year period ending December 31, 2010, one would arrive at a standard deviation of DELL's quarterly returns of 27.68 percent. However, over the 10 year period ending December 31, 2010, DELL's standard deviation of quarterly returns has been 18.28 percent. Importantly, the past 10 years of data for DELL's quarterly returns is far different than the preceding 10 years of data (from December 31, 1990, to December 31, 2001). In the preceding 10-year period, DELL's standard deviation of quarterly returns was 32.96 percent. The value in this calculation is evident in a comparison between DELL's standard deviation and the standard deviation for a benchmark, such as the S&P 500. Table 2.1 provides a comparison for the three different time periods discussed earlier.

In the first 10-year period (ending in 2000), DELL was over five times as volatile as the S&P 500 Index, while in the second 10-year period (ending in 2010), DELL was less than two times as volatile. Over the whole 20-year period, DELL is seen as over three times as volatile. In short, DELL's volatility in both absolute terms and relative terms changes dramatically from period to period. The value in this analysis, in my view is rather limited.

**TABLE 2.1** Quarterly Standard Deviation of Returns

| | 20 Years (1991–2010) | 10 Years (2001–2010) | 10 Years (1991–2000) |
|---|---|---|---|
| Dell Inc. (DELL) | 27.68% | 18.28% | 32.96% |
| S&P 500 Index | 8.19 | 9.35 | 6.49 |

I'm not sure what the take-away is in 2011. We currently believe DELL is undervalued, and its shares have limited risk, given its intrinsic value. In this regard, our view of risk is more in line with Graham's and Marks's than with more conventional calculations (such as a standard deviation). More important, however, is the fact that if we used the first 10-year period as the basis for forming an expectation about DELL's share volatility, we would have been well off the mark in terms of our precision. DELL's share price was more than 40 percent less volatile over the ensuing 10-year period, and that period was one characterized by a marked increase in market volatility.

Standard deviation measures the up and down movements of a given portfolio or stock, and includes movements that may be market related and movements that are unique to the company or portfolio in question. Standard deviation often is considered the *total risk* of a given portfolio or stock. However, we often take for granted that investing in the stock market has a certain element of risk associated with it, and as a consequence, we are more concerned with the relative risk of the particular investment we are considering. Beta provides a measure of a company's or portfolio's market related risk. Beta is a number that reflects the relationship between an asset and the market as a whole. It's sometimes referred to as a beta coefficient, or systematic risk. In this context, it is thought that a stock's risk is composed of a combination of:

1. Systematic risk—risk related to the market.
2. Unsystematic risk—risk unique to a company.

Beta is calculated by using the stock price returns of a company in conjunction with the price returns for the market as a whole. We calculate the beta for a given stock ($\beta_{stock}$), by dividing the covariance (COV) of the returns for a stock ($R_{stock}$) and the returns for the market ($R_{market}$) by the variance (VAR) of the returns of the market ($R_{market}$). The formula for the calculation of beta is provided in formula 2.3:

$$\beta_{stock} = \frac{COV(R_{stock}, R_{market})}{VAR(R_{market})} \qquad 2.3$$

Beta for a particular stock is also the slope in a regression of the particular stock's returns, on the market portfolio's returns (often the S&P 500 Index). In this construction, beta is the slope of the security market line (SML) relating the returns for the stock to the returns for the broader market portfolio.

**TABLE 2.2** Beta Calculated Using Quarterly Returns

| | 20 Years (1991–2010) | 10 Years (2001–2010) | 10 Years (1991–2000) |
|---|---|---|---|
| Dell Inc. (DELL) | 1.48 | 1.11 | 1.78 |
| S&P 500 Index | 1.00 | 1.00 | 1.00 |

Beta is a measure of relative volatility. A beta equal to 0.5 indicates that the stock is half as volatile as the market, while a beta of 2.0 indicates that the stock is twice as volatile as the market. A beta of 1.0 indicates that the stock is as volatile as the market.

Using the same data set used for the standard deviation calculations for DELL above, we can look at beta. Table 2.2 provides beta statistics for DELL and the S&P 500 Index (which, when regressed on itself, has a beta of 1.00, regardless of the time period).

Beta, standard deviation, and other tools for measuring volatility may be interesting, but they are limited in their ability to give us an accurate picture of the future. Indeed, studies into beta's predictive ability generally show that betas are insufficient metrics for explaining returns.[3] Still, while academics continue to discuss the merits of the capital asset pricing model (CAPM) and beta, it's worth noting that both beta and standard deviation are shorthand methods for evaluating the risk of an underlying investment. When we think of an investment in common stock, we can view our investment as a pro-rata share of a company. Many things make an underlying company a risky investment:

- Cash flow problems that lead to insolvency? *Yes.*
- Management that makes poor capital allocation decisions? *Yes.*
- Management that fails to defend a company's differentiated product offering? *Yes.*
- Increasingly obsolete products, with no strategy to improve or defend market positions? *Yes.*
- A stock price that's moved up and down a lot over the preceding three-year period? *No.*

Measurements of stock price movements are a crude form of trying to measure the risk of other factors that contribute to the riskiness of a company. More highly levered companies may be more volatile in the market, but it is

the debt that makes the company risky, not the volatility in the stock price that may be correlated with the debt. In addition, stock price movements also reflect the past and not the future risk of a company. When we look at common stocks in greater detail, I'll argue that extraordinarily high margins are risky due to the nature of competition. However, this risk will not be encompassed in a firm's price variability.

When a company's stock price movements depart from what we would expect from the firm's historical beta or standard deviation, the departure will occur due to new or unforeseen uncertainties pertaining to the company specifically or to the company's industry. Uncertainties drive unforeseen volatility, and given the manner in which humans approach uncertainties, they can also be the source of opportunities.

## Accounting Measures of Risk

Accounting measures or risk, by contrast, tend to focus on the company's current liquidity, current financial leverage and degree of operational leverage. Accounting measures of risk may include ratios that examine a company's ability to cover interest payments with proxies for cash flow (interest coverage ratios), or they may focus on debt as a proportion of the firm's assets or equity. While investment valuation focuses on a company's future prospects rather than the past performance inherent in accounting statements, accounting measures of risk are very tangible and useful guides for examining the risk that investors may face in holding a company's common stock.

There are a multitude of accounting measures of risk that are formally used, and certainly any individual could construct custom measure to glean information from other financial statement information. Formulas 2.4, 2.5, and 2.6 provide a handful of examples of financial risk ratios, measuring risk in three different parameters. The debt-to-equity ratio (2.4) provides a very broad sense of the financial leverage employed by the firm, showing debt as a proportion of equity. The current ratio (2.5) provides a sense of the company's liquidity position. The interest coverage ratio (2.6) gives the analyst a sense of the company's ability to earn income that covers its debt expense. This is very important, as it shows the company's ability to withstand downward movements in income while remaining solvent.

$$\text{Debt to Equity Ratio} = \frac{\text{Total Long-term Debt}}{\text{Total Equity}} \qquad 2.4$$

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad 2.5$$

$$\text{Interest Coverage Ratio} = \frac{\text{Income before Interest \& Taxes}}{\text{Interest Expense}} \quad 2.6$$

The degree of operating leverage, shown in the formula below (2.7), provides a different sense of risk for a company. Operating leverage, like financial leverage, can be very problematic for firms should the economic environment change and sales move lower. It should be noted that there are other ways in which to calculate the degree of operating leverage, including using the percentage change in earnings before interest and taxes (EBIT), divided by the percentage change sales. All methods provide the same sense of the company's ability to curtail expenses quickly in the face of falling sales. In short, operating leverage gives us an idea as to what the firm's breakeven point is, and the risks of high fixed costs.

$$\text{Degree of Operating Leverage} = \frac{\text{Contribution Margin}}{\text{Net Operating Income}} \quad 2.7$$

It should be noted that we are making a grander claim in looking at the degree of operating leverage. We presume that it is relatively easy to cut what we are presuming to be variable costs. While we may consider costs variable, it is oftentimes difficult for companies to cut labor. Moreover, companies can be locked into raw goods contracts that may impede their ability to cut costs as quickly as we presume. As a consequence, it is important to consider these ratios with a fair amount of skepticism. In addition, operating leverage and financial leverage are not necessarily bad things. Financial leverage allows common stock holders to realize a higher rate of return, so long as the returns on the company's investments are in excess of its borrowing costs. Also, operating leverage can work in a similar manner. When attendance at the Walt Disney Company's resorts moves lower, it still takes the same number of personnel to run the parks. The company's resorts division has a significant amount of operating leverage. However, when resort attendance moves higher, it doesn't take a proportionally greater number of personnel to run the resorts under this increased attendance scenario. In this case, operating leverage works in the company's favor. Results for DELL are provided in Table 2.3, and show a company with very little in way of financial and operating risk. It is true that the company's debt has risen as a proportion of equity, but its' liquidity position

**TABLE 2.3** Accounting Risk Ratios

| Fiscal Year Ending | 2/1/02 | 1/28/11 |
|---|---|---|
| Financial Risk Ratios: | | |
| Debt-to-Equity Ratio | 0.11 | 0.66 |
| Current Ratio | 1.05 | 1.48 |
| Interest Coverage Ratio | 30.84 | 41.36 |
| Operating Risk Ratio: | | |
| Degree of Operating Leverage | 4.42 | 4.32 |

(examining the current ratio) has improved, as has its interest coverage ratio. While there is risk to holding DELL's stock from a price volatility standpoint, the company is not subject to risks that would cause a firm to cease operations or turn to bankruptcy in order to continue operating. In short, from a financial and operational standpoint, there is very little risk to DELL.

Accounting measures of risk are very practical ways in which to approach the riskiness of a company. Can the company cover interest expense with income, and does it have a cushion should short-term results prove worse than expected? Will the company have operating troubles if sales fall in any given year, causing net income to fall at a greater rate? In terms of weighing the risk of a given investment, I can't think that accounting measures give us a relatively good look at the *risks* that a company could face in the future.

## Differentiating between Certain and Uncertain Cash Flows

While risk is for the most part backward looking and uncertainty pertains to future unknowns; we can see the linkage between these two concepts by looking at various investments grouped by the certainty of their cash flows. Table 2.4 provides standard deviation data for various horizons for different types of investments, including broad large-cap stocks, high-yield bonds, lower-rated investment-grade bonds ("BBB"), "A"-rated investment-grade bonds, highly rated investment-grade bonds ("AAA") and U.S. Treasury bonds. Looking at longer time horizons, one can see that as the certainty of the cash flow increases, the standard deviation of returns falls. This follows intuition and is consistent with the returns that one receives on these investments as well—more risk generally results in more return.

**TABLE 2.4** Annual Standard Deviation of Returns, through September 30, 2011

| | 5 Years | 10 Years | 15 Years | 20 Years |
|---|---|---|---|---|
| Stock Market Benchmark | | | | |
| S&P 500 Index | 18.31% | 15.74% | 16.49% | 15.07% |
| Bond Market Benchmarks | | | | |
| BarCap High Yield Bond | 13.95 | 11.06 | 9.99 | 8.90 |
| Citigroup Corp. BBB Sector | 7.85 | 6.80 | 6.13 | 5.87 |
| Citigroup Corp. A Sector | 7.89 | 6.65 | 5.91 | 5.701 |
| Citigroup Corp. AAA | 6.20 | 5.45 | 4.97 | 4.901 |
| Citigroup Treasury Index | 5.03 | 5.12 | 4.71 | 4.65 |

*Index Source:* Frontier Analytics, Standard & Poor's and Citigroup Index LLC.*



We are conditioned to expect that bonds are generally less volatile than stocks. However, the link between the volatility of bond prices and the certainties of cash flows is less intuitive. The easiest way in which to make a bond behave like a stock is to take away some of the certainty. Unfortunately, for some investors, this became a reality during the 2008–2009 credit crisis, when the liquidity in bond markets dried up. Holders of "A"-rated Lehman Brothers debt went from having the relative certainty of company-guaranteed cash flows and a senior claim on assets (senior to common stocks holders), to having simply a senior claim on assets. Indeed, the speed with which certain cash flows turned to uncertain cash flows was arguably the single largest contributor to the credit crisis, in terms of bond market liquidity. Table 2.5 provides standard deviations for some shorter time periods up through March 31, 2009. These shorter horizons, which magnify the short-term effects of the credit crisis, show the impact that changes in certainty had on the aforementioned array of securities during this harrowing period.

**TABLE 2.5** Annual Standard Deviation of Returns, through March 31, 2009

| | 1 Years | 2 Years | 3 Years | 5 Years |
|---|---|---|---|---|
| Stock Market Benchmark | | | | |
| S&P 500 Index | 25.88% | 20.48% | 17.66% | 14.69% |
| Bond Market Benchmarks | | | | |
| BarCap High Yield Bond | 23.77 | 17.12 | 14.27 | 11.45 |
| Citigroup Corp. BBB Sector | 14.14 | 10.03 | 8.51 | 7.17 |
| Citigroup Corp. A Sector | 15.61 | 11.05 | 9.23 | 7.68 |
| Citigroup Corp. AAA | 12.00 | 8.62 | 7.18 | 6.06 |
| Citigroup Treasury Index | 7.96 | 6.13 | 5.23 | 4.93 |

*Index Source:* Frontier Analytics, Standard & Poor's and Citigroup Index LLC.

The one- and two-year returns are inordinately impacted by the credit crisis, but the magnitude of the volatility can be seen as the impact reverberated through five-year standard deviations as well. I would note that for one-year and two-year periods, we are looking at a fairly limited time series, with only 12 data points and 24 data points, respectively, so I wouldn't necessarily draw broader asset-class conclusions from these data points. However, as we see the impact in longer horizons as well, my larger point holds nonetheless.

The change in bond price volatility was due to a variety of factors, including the lowering of interest rates during this time period. Still, it's revealing that the "A"-rated sector benchmark became significantly more volatile during this period, as holders of this grade of bonds faced much more uncertainty than was originally perceived. Indeed, the volatility for this subset of the bond-rating spectrum can be seen in comparison to the "BBB" sector benchmark, which for a while appeared to be less volatile than the higher grade "A"-rated issues. Still, it's not that "A"-rated issues become more risky than "BBB"-rated issues. Rather, the perceptions of certainties changed more for "A"-rated issues than for "BBB" rated issues, causing the underlying bond prices to become more volatile.[4] This is the underlying discontinuity between risk and uncertainty. Standard deviation and beta, as proxies for risk, are backward looking, while uncertainty deals with future events. As the future unfolds, risk will be recalculated and new uncertainties will take the place of old uncertainties. While this is not a problem for investment-grade bondholders in the vast majority of time periods, it became a problem during the 2008–2009 financial crisis and it will become a problem again, no doubt, in the future.

So what point am I trying to make here? In short, I'm attempting to emphasize the importance of uncertainty in investments. Individuals and institutions approach uncertainty in a variety of ways, depending on various factors. It's not simply a matter of one's cognitive ability to understand volatility and statistical measures such as standard deviation. It's not simply a matter of having a high tolerance for risk or being a thrill seeker or being cavalier. It's principally about how investors react to uncertainty.

At the end of the day, the appeal of bonds is the more certain nature of the cash flows that are characteristic of them. This is the reason that high-quality bonds generally play a very important role in any individual's pool of assets (asset allocation). High-quality bond cash flows are thought to be relatively certain, so the prices of high-quality bonds fluctuate far less than assets with less certain cash flow streams. Indeed, in the context of asset allocation, one's risk is mostly predicated on the mix between investments with uncertain cash flows and investments with more certain cash flows. This seems like a simple proposition, but viewing one's asset mix in this context can be useful in fighting the urge to diversify simply on the basis of near-term past performance.

A common stock's value is principally determined by the expectation of cash flows in the future. Not last quarter's cash flow, or last year's cash flow, but cash flows in future quarters and years. Current cash flows may give us an indication of the company's cash generating ability. Indeed, they serve a useful purpose in this regard. However, the future is uncertain. The cash flows in the future are not guaranteed, and the common stock holder is left with a gamble of sorts: does this investment eventually pay me in some manner or do the company's current results prove fleeting.

A piece of paper is not worth much. Given that I'm not guaranteed any return of value, a common stock is simply a piece of paper. I don't get compensated for just holding a stock. My common stock's value is predicated on the company's ability to reward me in some future time period. In this way, dividends and share repurchases are always preferable to the alternative, as they are an attempt to reward me in some fashion.

Dividends reward me with cash and are easy to understand for most investors. The company is giving me a return on my investment. Share repurchases also return *value* to shareholders; they reward me by increasing my proportional holding in the company. Consider a company with five shares of common stock outstanding. If I own one share of stock in this company, I own 20 percent of the company's common stock. Now, let's say that the company repurchases one share of stock. After this purchase, the company has four shares of stock outstanding. Given that I still own one share of stock, I *now* own 25 percent of the company. Share repurchases can be very

powerful. If one is simply reinvesting dividends in the company that is paying the dividend, a stock repurchase is achieving the same results. The only caveat I would add is that for a taxable investor, dividends can be a less valuable option, as dividends are taxed. Share repurchases have no tax consequences for the common stock holder, as the investor only pays a tax at the time they sell their shares. In the end, however, dividends and share repurchases are not guaranteed, and are paid when available. Moreover, while dividends tend to be sticky, and not change too much from quarter-to-quarter or year-to-year, they can be changed with no consequence to the company. There is no contractual obligation for a company to pay a dividend or repurchase shares.

A bond, in contrast, has a guaranteed cash flow stream, including the return of principal. While there is risk associated with my claim on company cash (in the form of interest), the investment is much, much, much more certain than the investment in a common stock. True, for corporate, municipal, and asset-backed bonds, there is a risk of bankruptcy or default. However, this risk is minor in a diversified portfolio of bonds, and is not equivalent to the risk one faces in common stocks. As a consequence, even in times of economic contraction, *high-quality*[5] bonds fluctuate in value much less than common stocks.

One can look at different types of common stocks: small-caps, large-caps, international, emerging markets, and so on. But all of these equity investments are based on uncertain cash flows. Similarly, commodities, in vogue at the present time, are very similar to common stocks, in that their value is very much subject to the uncertainty of demand at the time of sale. We don't know what the future will bring, so we don't know what we will get for our investment, and unlike a bond investment, we aren't guaranteed a return of any capital in a commodity investment.

At the end of the day, however, the behavior of high-quality bonds trumps the behavior of other asset classes, due to the more certain cash flow streams. While we can attempt to control volatility in more sophisticated ways, I question whether what we get is worth the trouble (and price!). High-quality bonds and high-quality bond funds are generally very liquid and relatively inexpensive and, when diversified, have far less volatility than other options. True, there are some hedge funds and mutual funds that have achieved admirable track records of performance that provide bondlike volatility. But, in these cases, you have investments that are still based on uncertain cash flows. The manager may have paired the correct trades in order to hedge risk and provide a relatively stable return stream, but there is no contract that stipulates that this return stream will remain stable. Thus, from time to time, we have situations when such investment schemes don't deliver what we thought

they would deliver. Unfortunately, these situations tend to coincide with more volatile investment periods (such as 2000–2002 or 2007–2009). In the end, it's fairly simple: look for certain cash flows (provided by high-quality bonds) to minimize and control risk; look at other types of investments to increase overall returns.

## Conclusions

The point of this chapter has been to draw a focus to the relationship between risk and uncertainty. As this book progresses, we'll discuss in greater detail uncertainty and the way in which individuals approach the uncertain assumptions that underpin investment valuation. To this end, an understanding of the interplay between standard measures of risk and their relationship to uncertainty is important.

At the end of the day, risk is difficult to quantify. More often than not, we rely on representations of risk, and hope that our representations turn out to be reflective of what we experience over time. In terms of identifying opportunities, an understanding of risk must necessarily transcend traditional finance measures of risk. Beta and standard deviation do not adequately address risk in terms of valuation.

For a more forward-looking assessment of an investment's risk, I would propose that investors examine the underlying fundamentals of the company, focusing on accounting measures, rather than financial measures. Accounting measures of financial and operational leverage likely give us a better sense of these future risks than the past variability in the company's share price.

Still, assessing risks is but one side of the investment valuation coin. The complement to risk is opportunity. Hopefully, what will become clear as this book progresses is that our assessment of uncertainties is a vital component to assessing both risk and opportunity. The opportunities that we find in the stock market are created by market inefficiencies. As I'll discuss in Chapter 5, market inefficiencies are largely the result of behavioral errors, as we tend to approach uncertainties with a number of biases. In terms of opportunities, we don't underestimate a given company's ability due to the risk we see present in the variability of the company's stock returns. We underestimate a given company's ability because of behavioral errors that we make in addressing primary assumptions needed to calculate intrinsic value. While I'll address these behavioral errors in greater detail in Chapter 4 and Chapter 5, our examination of the inefficiencies present in the market will begin in Chapter 3, the start of Part II of this book. We'll begin our quest to understand why markets

behave in the manner in which they behave. Chapter 3 is an explanation of theories that underpin notions of market efficiency. As I'll offer a broad-based critique of market efficiency in the other chapters in Part II, our starting point must be a full understanding of conventional views of market efficiency.

## Notes

1. Howard Marks, "How Quickly They Forget," memo to Oaktree clients, May 25, 2011, p. 8.
2. Benjamin Graham, *The Intelligent Investor: A Book of Practical Counsel,* 4th rev. ed. (New York: Harper & Row), 61.
3. Eugene Fama and Kenneth French, 1992. "The Cross-Section of Expected Stock Returns," *Journal of Finance* 47(2) (June 1992): 427–465.
4. This can be seen as a short-term phenomenon, however, as we expect that over time the underlying volatility of the bond-rating spectrum will stay true to our expectations (as we can see from Table 2.1, as time passes, the effects do diminish).
5. Throughout this section I refer to high-quality bonds rather than simply bonds. Low-quality bonds, also known as "junk" bonds or "high-yield" bonds, behave more like equities (stocks) than bonds. In periods of stress, such as economic contractions or significant downward movements in common stocks, high-yield bonds will be less liquid, and will fluctuate in value much more than high-quality bonds. While it is true that high-quality bonds can become high-yield bonds, as credit ratings can change overnight, a diversified portfolio of high-quality bonds will mitigate this risk to the overall portfolio. I do think there is a place for high-yield bonds in an investors overall portfolio; however, I would not consider it a part of a "bond" or high-quality bond exposure. I would advise investors to consider high-yield bonds equity-like, and view them as part of the "uncertain cash flow" portion of the portfolio.

# PART TWO

# Market Inefficiency

CHAPTER 3

# An Introduction to Market Efficiency

We live in an investing era that has changed dramatically over the past quarter century. While we've experienced several market crashes, *bear* markets, recessions, and *bubbles,* these are not new things. They're not the changes I'm referring to when I say the investing era has changed dramatically. In truth, our view and understanding of how markets work has changed dramatically. In historical terms, modern finance theory remains in its infancy. Much of what we understand in terms of finance was formulated in my lifetime. And I'm not that old!

Early on, in the first half of the twentieth century, much of finance was structured around an assessment of intrinsic value. The penultimate work of this era was Benjamin Graham and David Dodd's *Security Analysis* (1934) or Graham's classic, *The Intelligent Investor* (1949). In these tomes, the authors advise would-be investors to buy stocks when market values fall below intrinsic values and sell stocks when market values move above intrinsic values. Much was made of security analysis, and economic models did not play a part in practitioners' assessment of the market.

Starting in the 1950s, economic thought—or at least the tenor of academic research—moved in another direction that was less concerned with the favorableness of individual market constituents, and more concerned with examining market pricing under the constructs of equilibrium models.

This line of thought, generally spearheaded by the "Chicago School," prevailed well into the 1970s, and due to a generation of educators reared on this economic force, it even prevails today as the primary tool in training young men and women in security analysis and finance.

Still, in the late 1970s and early 1980s, a new school of thought began to emerge in economics that attempted to reconcile the strict constructs of economic theory with the real-world behavior of markets (or empirical evidence). This new, behavioral school of thought is very loosely organized and spans a wide range of theories. It's primarily concerned with behavior but is tied to market inefficiencies and economic anomalies. Sometimes, one will hear it described as behavioral economics, or behavioral finance, but it's also tied to positive or descriptive theories of economic behavior.[1]

Much of this book is concerned with investor rationality or lack thereof. However, while I think we would normally consider irrationality in a pejorative sense, in my view it need not be. I am subject to bouts of irrational behavior, as are most people. My concern has to do with controlling my own behavior or fashioning heuristics that help me sidestep such behavior.

Still, the world would be a different place if we all behaved free of irrational impulses. Indeed, most wouldn't start new businesses, most wouldn't take chances, and our enjoyment of the world would certainly be curtailed. Can an artist or chef or actor or athlete perform at the top of their game without passion? The answer is clearly no. However, these same passions undermine our decision making in many other pursuits—and certainly one's investment decisions are in the sphere of activities that are not enhanced by passion.[2]

In spite of our affinity for sports and animal metaphors in the realm of investing, the implication that passion drives success, or wanton *animal spirits*[3] drive good decision making runs contrary to both logic and the empirical evidence. Obviously, in the physical world of sports or acting, passion is useful, as it fuels adrenaline, and helps one overcome obstacles of a black-and-white nature. In more cerebral pursuits—especially those in markets with uncertainties—passion is much more problematic.

If everyone on a football team shares the same passion and unyielding desire to win, the resulting benefits of passion add value. Indeed, passion on both sides of the field makes for a good game, as one team's animal spirits face off against another team's animal spirits. If, however, the team is a group of securities analysts or professional investors—and certainly don't discount the desire to be on "a side" of a stock analysis—such passion helps brew *bubbles* and at the very least leads to overvaluation.

But here I'm getting ahead of myself. One of my principal goals for this book is to help readers appreciate how opportunities arise in the realm of large-cap stocks. Part of this appreciation is an understanding of how markets work. To this end, in this chapter I'll examine the three theories that underpin the notion of market efficiency. While I'll offer a greater critique

of these theories in later chapters, our starting place is to understand how modern finance theory evolved, and how many in the world of economic and finance research view the working of markets. After examining the theories that underpin notions of market efficiency, I'll examine the efficient markets hypothesis, or EMH. The EMH provides a guide for examining the notion of market efficiency according to the amount and type of information that is at the analyst's disposal. However, while the EMH offers an interesting way in which to view different types of information, it's not the foundation on which market efficiency is based.

## The Basis for Market Efficiency

Let's start by asking a question: why would markets be efficient? Why would we expect markets to be efficient? Notice that I'm not asking for an assessment of the efficiency of markets; I'm asking for a theory. I'm asking for a rationale. I'm asking for a starting place in understanding markets, but, importantly, I'm not looking at markets. I'm asking a theoretical question, and looking for a theoretical answer.

This question was asked more than 40 years ago by Eugene Fama. In a groundbreaking work that sought to offer a rationale for why it was so difficult to beat a broad portfolio of randomly selected common stocks, Mr. Fama offered what would eventually become the cornerstone for much of modern economic thought.

His starting point is the concept of market efficiency and the theory that if prices are not exactly spot-on, they will coalesce randomly about the rational price. In his *Theory of Random Walks*, Mr. Fama notes:

> Random walk theorists usually start from the premise that the major security exchanges are good examples of "efficient" markets. An "efficient" market is defined as a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants.
>
> In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value.[4]

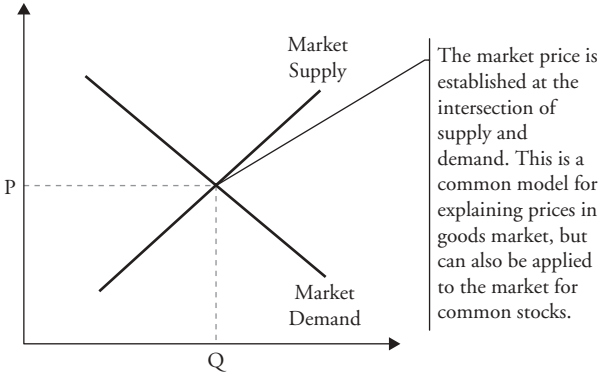
In short, Fama starts with an assertion that, at the time, was neither entirely new nor controversial: supply and demand for a good establishes a fair market price. In a market for goods, the quantity demanded increases as the price falls, while the quantity supplied increases as the price rises (see Figure 3.1). Equilibrium prices, or fair market values, are established when the amount supplied at a given price coincides with the amount demanded at the same price.

This theory, already accepted in its application to other goods, became an established assumption in most economists' understanding and characterization of securities markets. Stephen LeRoy more directly acknowledged this several years later, when he noted that most of "the lessons of market efficiency are direct consequences of thinking about financial asset prices as determined by the conditions of equilibrium in competitive markets populated by rational agents." Moreover, it's worth noting that this notion of market efficiency dovetailed nicely with a traditional economic framework.[5] In short, though, the starting place for market efficiency is a populace of well-informed, *rational* market participants.

Fama goes on to note that:

> . . . there is always room for disagreement among market participants concerning just what the intrinsic value of an individual security is, and such disagreement will give rise to discrepancies between actual prices and intrinsic values. In an efficient market, however, the actions of the many competing participants should cause the actual price of a security to wander randomly about its intrinsic value.[6]

**FIGURE 3.1** Market Supply and Demand



In other words, even if investors are off the mark—or, alternatively, even if investors are irrational in their expectations—their assessment of "value," which will influence the market price, will fall randomly around the intrinsic value.

Thus, market efficiency is predicated on rational market participants assessing values—in a manner that is not dissimilar from more generalized equilibriums. And while we are dealing with uncertainties in the realm of investment theory, the differing assessments of value will fall neatly around an intrinsic value—the market value. The overoptimism of some market participants is canceled out by the overpessimism of others.

More succinctly, in this worldview, investors are rational, but even if they are not all rational, the irrational investors cancel one another out.

Intuitively, this makes sense. We all like to think of ourselves as rational actors who make sound decisions in all parts of our life. Moreover, we expect as much of our fellow man. We expect that their decisions will be rational. But if our fellow man is not rational, we expect that they will deviate (from a decision-making standpoint) only modestly from what is reasonable. Moreover, as they are not reasonable to begin with (they are not making rational decisions!), we expect that there will not be uniformity in their responses. But what if both of these predictions of human behavior don't hold? What if a vast populace of our fellow man is, at times, both irrational and influenced by their fellow irrational brethren? What then?

In short, it is thought that these fools can be taken advantage of. It is thought that this irrational populace can be used as a tool for making money. Once again, this is very intuitive. If something is worth only $5, and someone will pay $10 for it, I will sell him as many of the $5 product as I possibly can. I will continue to undertake this arbitrage strategy (purchasing an item at one price and selling it to another simultaneously at a high price) until the disparity between a goods' value and its market price disappears. That sounds like a great deal, and for those who find opportunities like this, it can be very rewarding.

Milton Friedman[7] is generally credited with this final *arbitrage* safeguard. Arbitrage protects the integrity of market pricing, even when there is irrationality among market participants and their behavior is correlated. It is thought that we can always count on our fellow, dispassionate countrymen to smartly take advantage of the fools among us. Friedman explained that even if systematic behavior is not neutralized, the arbitrageur will ensure that market prices converge on intrinsic value, as the naïve in such a scenario are either ruined or marginalized by their own inferior actions.

In the end, market efficiency sits on a foundation of three theories:

- Individuals are rational beings that make self-interested choices.
- In cases where individuals behave irrationally, their *errors* are canceled out by others who take an opposing viewpoint. In other words, irrational market participants' actions are not correlated with other irrational market participants' actions.
- In cases where correlated mistakes among irrational market participants occur, arbitrageurs stand ready to rectify erroneous pricing. This group of coldly rational market participants stands ready to act quickly and decisively.

These theories are logical and intuitive, and they appeal to both our expectations for ourselves, as well as our expectations for our fellow man. Moreover, nowhere would such theories seem more likely to hold true than in the highly competitive, potentially profitable, liquid securities markets of the United States.

## Efficient Markets Hypothesis

Fama went on to articulate the efficient markets hypothesis (EMH) in the 1960s and early 1970s, differentiating levels of knowledge. The EMH holds that information does not lead to an ability to generate returns that exceed the returns of the market on a risk-adjusted basis. In a groundbreaking work, "Efficient Capital Markets: A Review of Theory and Empirical Work," Fama articulated three forms of market efficiency: weak form, semistrong form, and strong form.

In weak-form efficiency, past price behavior cannot be used to predict future price behavior. Technical analysis, in vogue from time to time, would contend that weak-form efficiency does not hold, and thus, charting the course of prices can result in information that can lead to profitable investing in some securities.

Semistrong-form efficiency posits that public information cannot be used as the basis to profit, as the market assimilates information immediately. In this form, the EMH contends that security analysis of any kind is not a profitable endeavor. Information that is available in the market does not allow for superior knowledge on the part of any one participant, and thus, there is no manner in which to exploit any information. Importantly, this is not to say that some stocks would not be inclined to move higher than others and that one cannot identify stocks with superior return potential. However, the risk that is associated with common stocks with higher potential returns is commensurate

with the return premium. Consequently, one is not being compensated for his superior research, but instead for the risk that he is taking with his funds.

The strong-form EMH goes one step further, hypothesizing that individuals cannot profit from information of any kind—price, publicly available information, or privately available information.

In general, it is thought that weak-form efficiency and semistrong-form efficiency hold, while strong-form efficiency does not. Private, nonpublic, insider information is thought to provide an opportunity for profit and is viewed as unfair in our investment market (and, as a consequence, it is illegal to trade on such information).

## Empirical Support for the Efficiency of Markets

It's also important to note that much of market efficiency is predicated on the inability of investors—professional or nonprofessional—to beat broader stock market indices, net of their fees, over extended time periods.

Arguments supporting the notion of market efficiency generally hinge on an inability to profit from said inefficiencies. Often, aggregated mutual fund performance is pointed to as "proof" that markets are efficient, as the average mutual fund generally underperforms the broader market. As explained in Chapter 1, William Sharpe's influential 1966 paper "Mutual Fund Performance"[8] convincingly made the case that markets are sufficiently efficient to render active management futile. In his examination, Sharpe analyzed 34 open-ended mutual funds, looking at a data set that covered the period 1954 to 1963. This examination included balanced funds, equity funds, and income funds and looked at the relative and risk-adjusted performance of this broad group of funds. But, as noted previously, this is but one of many studies (see work by Jenson,[9] Carhart,[10] and others) that have drawn similar conclusions.

Burton Malkiel, has spent considerable time critiquing the critiques of the efficient markets hypothesis, and noted in a 2005 paper[11] on the subject that the vast majority of large-cap equity funds underperformed the S&P 500 Index, regardless as to the holding period. Indeed, as the holding period was lengthened the proportion of managers underperforming the S&P 500 Index increased. According to Malkiel's research (which used a database from Lipper Analytical Services), after 10 years, 86 percent of large-cap equity funds underperformed the S&P 500 Index, while after 20 years 86 percent underperformed the benchmark. Malkiel further notes that on average, over the 10 and 20 year periods "the typical actively managed fund underperforms the index fund by over 200 basis points."[12]

Still, recall from Chapter 1, recent work by Cremers and Petajisto. Their analysis indicates that *truly* active managers add value, and taking a more nuanced approach to an examination of funds has merit. Indeed, in their analysis, Cremers and Petajisto estimate that "a 30% increase in Active Share is associated with an increase of 2.17% in benchmark adjusted alpha over the following year."[13] However, as was discussed in Chapter 1, Cremers and Petajisto point out a very important trend that has dishonored the active management industry and added considerable credence to studies that argue active management is futile—the emergence of the "closet index" fund. Not differentiating between *truly* actively managed mutual funds and quasi-passive index emulators does lead one to the conclusions cited by Sharpe and others.

And, certainly, I would concede this is the case, as it's fairly difficult to argue that the average mutual fund has earned its fees. Still, that the average mutual fund does not earn its fee year-in and year-out, and over longer time periods does not tell us the market is efficient. Indeed, it tells us that the average mutual fund manager is unable (or unwilling) to capitalize on the inefficiencies, or simply doesn't recognize the nature of the inefficiencies.

## Conclusions

In undertaking the active management of large-cap portfolios, portfolio managers and analysts, either implicitly or explicitly, assume that markets are inefficient. It is important to realize what this means. The three theories underpinning market efficiency are intuitive and logical. They describe behavior that we, in general, would like to aspire to and, as a consequence, we would like our fellow man to aspire to. We expect that we and our fellow man are logical and rational actors in society. It is appealing to think that irrationality is particular to the individual and not contagious. Finally, as members of a capitalist society, we expect that "smart" money will always take advantage of those that veer from rationality in a correlated manner—in short, profiting from the errors of others.

This chapter has set the stage for the next three chapters as we look more critically at the theoretical foundation underpinning the notion of market efficiency. In the next chapter, we'll look at how the market behaves and how individuals behave, and determine if the behavior of both conforms to what we would expect given the three theories discussed in this chapter. In Chapter 5, we'll discuss, head-on, whether it's reasonable to expect that the first theory holds true: is individual behavior rational and consistent? In Chapter 6, we'll

look at the second and third theories, examining whether individuals are drawn to herd behavior and whether arbitrage is as easy as it would seem in the discussion in this chapter.

While I've only touched on the EMH, we will revisit these assumptions in Chapter 7, when we look at conventional views of market inefficiency. The conventional view of the inefficiencies present in the market is at odds with the EMH. However, importantly, the conventional view does not address failures in the three theories underpinning the broader notion of market efficiency. This, as I'll note in Chapter 7, is a major failing of the conventional view and may be a reason that portfolio managers find it so difficult to outperform passive benchmarks.

This book is mainly about the identification of large-cap opportunities. However, in order to identify opportunities, we must first determine how opportunities materialize. If markets are inefficient, we must determine how they are inefficient, and how we can take advantage of the errors that result in the inefficiencies. While this chapter has offered little in the way of guidance, hopefully, one will find it to be an important stepping-stone as we move forward.

## Notes

1. Richard Thaler, "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization* 1 (1980): 41.
2. When speaking of passion in the sphere of investments, I'm referring to decision making, not one's passion for a subject matter. Clearly, one can be passionate about the subject matter, much as I am; however, when passion and despair overwhelm our decision making, clearly our results suffer.
3. ". . . animal spirits—a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities." John Maynard Keynes, *The General Theory of Employment Interest and Money* (London: McMillan, 1936), 161–162.
4. Eugene F. Fama, "Random Walks in Stock Market Prices," *Financial Analysts Journal* (September–October 1965): 56.
5. Stephen F. LeRoy, "Efficient Capital Markets and Martingales," *Journal of Economic Literature* XXVII (December 1989): 1583–1621. LeRoy goes on to note that a more applicable model is a Martingale Model, first linked to Paul Samuelson's 1965 paper—although this is irrelevant for purposes of explanation here.
6. Fama, 56.
7. Milton Friedman, "The Case for Flexible Exchange Rates," *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953).

8. William F. Sharpe, "Mutual Fund Performance," *Journal of Business* 39 (1966): 119–138.
9. Michael C. Jensen, "The Performance of Mutual Funds in the Period 1945–1964," *Journal of Finance* 23(2) (1968): 389–416.
10. Mark M. Carhart, "On Persistence in Mutual Fund Performance," *Journal of Finance*, 52(1) (1997): 57–82.
11. Burton G. Malkiel, "Reflections on the Efficient Market Hypothesis: 30 Years Later," *Financial Review* 40 (2005): 1–9.
12. Ibid., 3.
13. K. J. M. Cremers and Antti Petajisto, "How Active Is Your Fund Manager? A New Measure That Predicts Performance," *Review of Financial Studies* 22(9): 3329–3365.

*The Large-Cap Portfolio: Value Investing and the Hidden Opportunity in Big Company Stocks*
by Thomas Villalta


# CHAPTER 4

# Evidence of Inefficiency in Investor Behavior and Market Behavior

In Chapter 3, I outlined a very logical and rational case for market efficiency. However, for those who follow markets, simple observation makes the notion of market efficiency fairly difficult to swallow. Casual observers who want to accept that arbitrage keeps prices in alignment must be struck by how much the market moves and how much time elapses between significant market movements down and significant movements up. Moreover, those of us who manage a client base are likely equally struck by our clients' actions in response to extreme market movements and our clients' desire to chase the *story* of the day. The efficiency of the stock market is largely predicated on a theoretical case and not on observations of how markets actually behave.

In Chapters 5 and 6, we'll take a look at a breakdown of the theoretical case for the efficiency of markets. While Chapter 5 will discuss in greater detail the irrationality of *individuals* and posit theories as to why individuals behave the way they do, this chapter is primarily concerned with what individuals do and how markets behave. As I'll discuss in Chapter 5, determining why individuals behave the way they do requires experiments that allow for a certain degree of control. When researchers can control certain variables, they can isolate elements to decision making and then make broader generalizations. While such experiments are difficult to undertake in *real-world* situations, we can still examine what individuals do in actual securities markets and also examine how markets behave. This won't give us insight into how to take advantage of others' behavior or control our own behavior, but

it will provide a backdrop for us to evaluate the efficiency of common stock markets and the irrationality of market participants.

In this chapter, I'll first take a look at closed-end funds and discuss what can be learned from a group of securities that are fairly easy to value. Next, I'll discuss market *bubbles*, market *crashes*, and the behavior of the domestic stock market over the past 40 years. I'll then turn to an examination of investors' behavior, looking at individuals' actions in relation to the market's performance. I'll end by discussing how value-oriented strategies tend to outperform the broad market and what this tells us about market efficiency.

## Closed-End Fund Discounts and Premiums

In general, price-based market anomalies are difficult to profit from and appear inconsistently. In an appendix to Chapter 7, I'll discuss calendar effects and why I don't believe it's fruitful for investors to structure processes to act on what I term *underexplained* market phenomena. While we focus our efforts on taking advantage of the irrational behavior of market participants, we generally look at individual securities or industries. Broader market opportunities, while present in certain extreme economic environments, are less common. However, there is a price-based anomaly that appears with regularity and provides evidence of security mispricing: closed-end funds. As the value of a closed-end fund is derived from its' holdings, determining the intrinsic value of these securities can be done quickly and with certainty. Because of these characteristics, closed-end funds are a puzzle for efficient markets theorists, and provide some of the more compelling evidence that markets are inefficient.

Closed-end funds are mutual funds that trade like common stocks. Like common stocks, closed-end funds trade on an intraday basis, and are priced by the market second by second. Like open-ended mutual funds, closed-end funds are portfolios of common stocks or other securities that are themselves priced in the market on an intraday basis. Like open-ended mutual funds, closed-end funds have net asset values (NAVs) that are calculated at the end of each day that reflect the underlying holdings within the funds. Unlike open-ended mutual funds, you cannot purchase closed-end funds at NAV; you purchase them only at their intraday market values.

One of the oldest such funds is Tri-Continental Corporation (TY), a closed-end fund that was formed in 1929. TY is currently managed by

Columbia Management Investment Advisors, LLC, and primarily invests in large-cap U.S. common stocks. We would think that given the liquidity of the assets that TY holds, this closed-end fund would trade in lock-step with its NAV. This is not the case, as TY's market value has fluctuated significantly through the years, at times trading at a premium to NAV and at times trading at a discount to NAV. We can get a sense of this volatility by simply looking at a comparison of the company's per-share market value ("Market") in comparison to its per share NAV ("NAV"). This comparison can be found in Figure 4.1.

Over the past 10 years, TY has consistently traded at a discount to its NAV. However, the range of this discount has been fairly significant, with as small a discount from NAV as 1.78 percent (on 9/15/2008), and as wide a discount from NAV as 18.62 percent (on 6/26/2009).

TY is one of the oldest closed-end funds in existence, but its discounts and premiums are not unique, as almost all closed-end funds trade at premiums or discounts to NAV. To see a wider disparity over the past 10 years, we can look at Gabelli Equity Trust, Inc. (GAB). A comparison of GAB's per-share NAV and per-share market value is found in Figure 4.2.

GAB is managed by Gabelli Funds, LLC, and is similar in market capitalization to TY (both have market capitalizations of just under $1 billion). Like TY, GAB invests in publicly traded companies and benchmarks itself to the S&P 500 Index. Unlike TY, GAB does invest in foreign domiciled firms. GAB's market value has fluctuated significantly from NAV over the past 10 years, ranging from significant premiums to NAV to significant discounts to NAV. We can see this in Figure 4.3.

**FIGURE 4.1** Tri-Continental Corp.—Net Asset Value and Market Value (1/2/02–12/30/11)

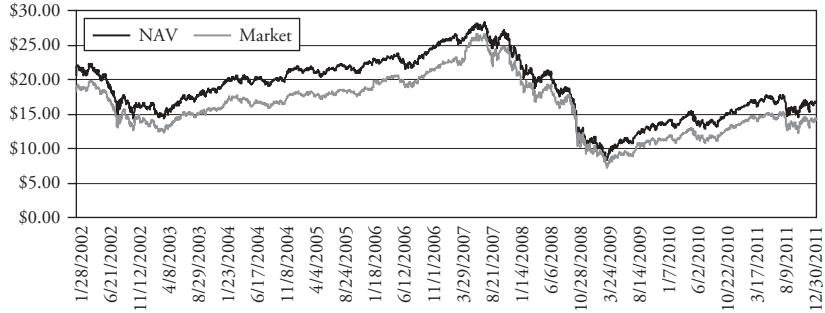


**FIGURE 4.2** Gabelli Equity Trust, Inc.—Net Asset Value and Market Value (1/2/02–12/30/11)

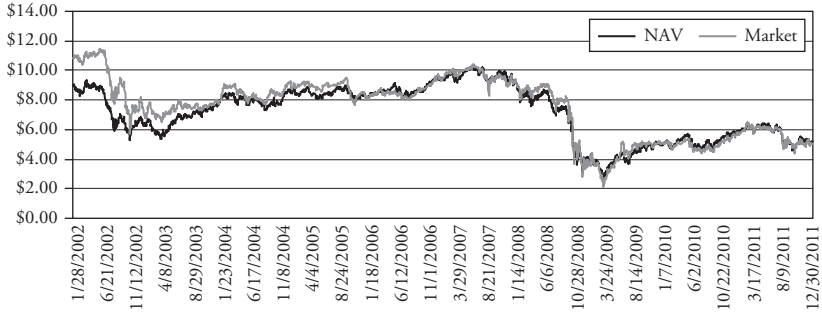
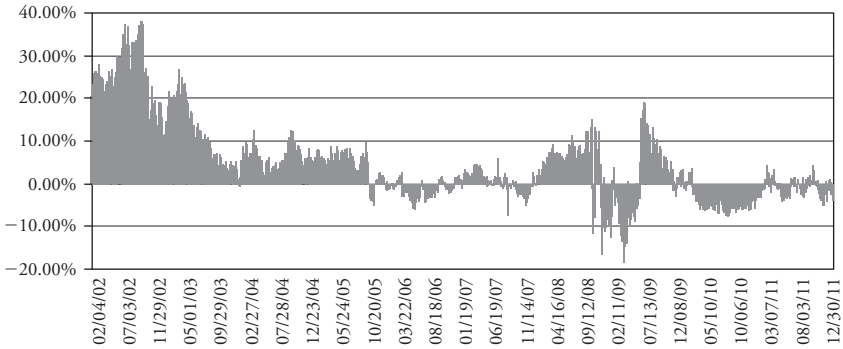



**FIGURE 4.3** Gabelli Equity Trust, Inc.—Market Price Discount from NAV (1/2/02–12/30/11)




Over the past 10 years, GAB's market value has fluctuated from premiums (above NAV) of as much as 38.06 percent (on September 5, 2002) to discounts (below NAV) of as much as 18.56 percent (on March 9, 2009).

If one could purchase a closed-end fund in its entirety at a discount and sell its assets, while at the same time shorting the stocks that the fund is comprised of (a classic risk-free arbitrage), then one would realize the difference between the market value and the NAV. This risk-free trade would seem to be very profitable and easy to accomplish. Closed-end funds should trade relatively close to their NAVs, with discounts being appropriate, given various costs to investing (such as management fees and taxes). But, often, closed-end funds don't trade very close to NAV, which results in a puzzle of sorts for

efficient market theorists. The *closed-end fund puzzle* has been discussed for more than a quarter century, and remains an enduring anomaly in markets. In short, a number of questions arise from the trading behavior of closed-end funds:[1]

1. Why are closed-end fund sponsors able to initially offer closed-end funds at a premium to shareholders?[2]
2. Why do closed-end funds soon move from a premium to a discount, and then trade at a discount regularly?[3]
3. Why do closed-end fund market values fluctuate from NAV, offering more or less of a discount from NAV and also trading at a premium at times?
4. Why do discounts shrink when closed-end funds liquidate or are turned into open-ended funds?[4]

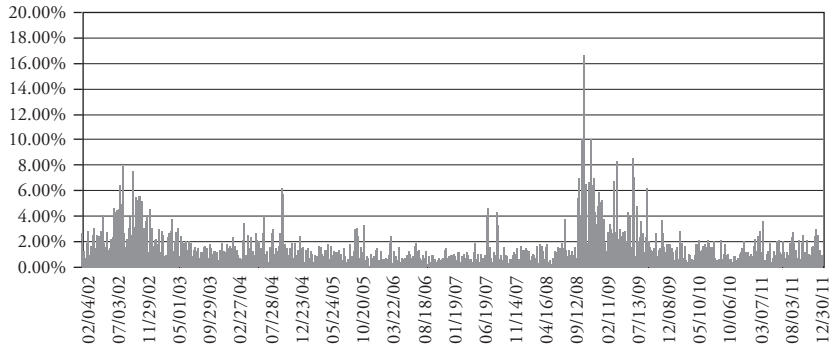
Efficient market theorists generally point to four explanations in an attempt to reconcile the puzzle with theories of market efficiency:

1. The existence of management fees should result in a continual discount from NAV.[5]
2. NAV premiums or discounts will depend on the success of the manager managing the fund's assets.[6]
3. Some of the securities held by closed-end funds are illiquid, so a discount should be applied to account for illiquidity of these holdings.[7]
4. Embedded capital gains should cause the fund to sell at a discount to NAV, as a sale of the assets (if one could purchase the entire closed-end fund and sell the assets to realize the difference) would result in a tax liability for the fund.[8]

While in aggregate these explanations may support a discount, they do not explain the wide range of discounts that closed-end funds continue to exhibit on a day-to-day basis. Looking at the swings from day-to-day discounts and premiums (sometimes from discount to premium) in GAB shows that there are certain periods that display a significant amount of day-to-day volatility in the difference between NAV and market value. Figure 4.4 provides a graphical representation of this volatility.

Note that this is the absolute value of the day-to-day change in the discount, not the value of the discount. For example, in the midst of the financial crisis in 2008, GAB's market value moved from a discount to NAV of 8.14 percent (October 13, 2008) to a premium to NAV of 8.46% (October 14, 2008),

**FIGURE 4.4** Gabelli Equity Trust, Inc.—Day-to-Day Change in NAV to Price Difference (1/2/02–12/30/11)




a swing of 16.60 percent. This is not the share price, but the difference between the share price and NAV, and its movement from day to day. As the chart above shows, daily movements in the discount or premium in excess of 5 percent are not uncommon for GAB. Moreover, the movements appear to coalesce around periods of significant market uncertainty and some might argue overreaction.[9] During the bottoming of the market in 2002, after the technology—media—telecommunications bust, and during the 2008–2009 financial crisis and market fall, we saw considerable movements in the discounts and premiums, with discounts turning into more severe discounts and then turning into premiums on a day-to-day basis.

While the closed-end fund puzzle provides a very stark example of security misicing and some might argue the irrationality of market participants who purchase initial offerings of closed-end funds, it is not alone in providing an example of market behavior that veers from the rational to the irrational. Looking at the pricing of a security whose fundamental value is derived from the pricing of other assets provides a very clear-cut example of the mispricing of securities. In the next section, we'll build on this notion of market error, by looking at market *bubbles* and market *crashes*.

## Market Bubbles and Market Crashes

While the closed-end fund puzzle provides a very clear example of individual security pricing errors, there is still another argument to be made supporting the notion that markets are largely inefficient short-term pricing mechanisms: the existence of market bubbles and crashes. One needs to look no further

than historical market performance to conclude that the market often suffers from fits of euphoria and fits of despair.

Market bubbles and market crashes have been a part of investing for over 300 years. The first documented bubble related to the market for tulips. Tulip speculation in the Netherlands between the mid-1500s and 1637 (influenced and sustained by trading and speculative contracts[10]) eventually crashed in 1637. Bubbles always crash, as they're prone to the overallocation of capital to whatever market is being exuberantly pushed higher. However, crashes can materialize without bubbles, as we found in 1987 and 2010. Alas, it seems as though we are prone to fits of exuberance and despair, as the bubble in the Dutch tulip market was only the first of what would become many asset bubbles and crashes over the ensuing centuries (see Table 4.1).

While one would think that we would learn from history, three market crashes in the past 10 years would seem to prove this assertion incorrect. The mere existence of market bubbles and market crashes provides support for the assertion that markets are often inefficient in the short term. One can look at the price behavior of individual stocks or industries or sectors, but the performance of broad market benchmarks is sufficiently compelling to lead one to conclude that markets often move too high too fast and too low too fast.

The market crashes cited earlier are but one aspect to market movements; severe bear markets and euphoric market bubbles disprove the notion that

**TABLE 4.1** Sampling of Market Bubbles and Crashes

| Bubble/Crash | Crash |
|---|---|
| Dutch tulip mania | 1637 |
| South Sea bubble | 1720 |
| Mississippi bubble | 1720 |
| U.S. railway boom | 1873 |
| Florida land boom | 1926 |
| U.S. stock market bubble | 1929 |
| Black Monday | 1987 |
| Technology, media, telecommunications bubble | 2000 |
| U.S. real estate bubble | 2007 |
| Stock market crash of 2008–2009 | 2008 |
| 2010 flash crash | 2010 |

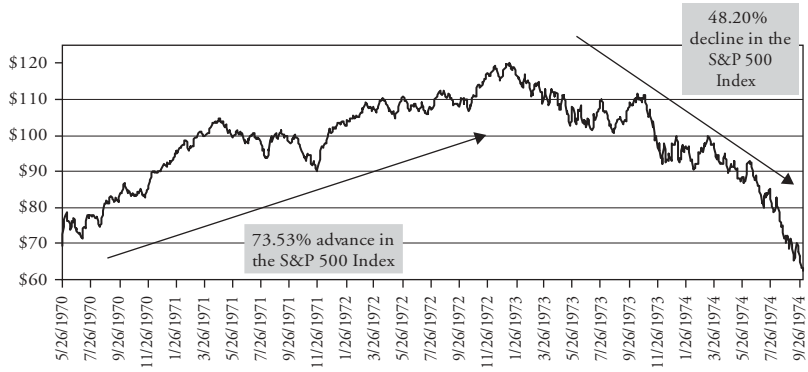
stocks are priced based on long-term future cash flows. True, one can argue that as we are dealing with uncertainties, it is reasonable for prices to move abruptly as aggregate investor perspective changes, but this would leave rationale pricing devoid of any genuine value. If severe movements at the whim of market forces are indeed efficient, that efficiency has no meaning in the context of investing.

Proof of this can be found in the aggregate overshoot that we see in benchmark performance, following wild swings upward and downward. Moreover, as the performance of benchmarks such as the S&P 500 reveal, wild market movements are not strictly confined to small-capitalization stocks and markets with limited liquidity. Capitalization-weighted benchmarks, such as the S&P 500, are heavily tilted toward mid- to large-cap stocks, with the largest issues representing a disproportionate share of the underlying performance of the benchmark. Consequently, the fact that the S&P 500 makes significant upward and downward movements over short investment periods is revealing. It tells us that a proportion (if not significant proportion) of the largest issues in the benchmark must be participating.

As an example, consider the rise and fall of the "Nifty-50" stocks in the early 1970s, shown in Figure 4.5.

"Nifty-50" referred to 50 large "growth-oriented" stocks that experienced phenomenal growth in the 1960s and early 1970s. Indeed, this group of common stocks was sometimes referred to as "one-decision" stocks, as many thought that investors need only make one decision—buy the stocks and hold on forever. From late May of 1970 until early 1973, a roughly two-and-a-half-year period, the S&P increased by more than 73 percent, from 69.29

**FIGURE 4.5** S&P 500 Index—"Nifty 50" Rise and Fall



to 120.24. Then, in less than two years, following that high point, the S&P 500 fell more than 48 percent to 62.28.

A steeper decline, in a panicked 1987 market crash, shows a more remarkable short-term downward movement in the S&P 500 Index, as found in Figure 4.6.

In this case, the S&P 500 fell more than 30 percent in a two-week time period. In the year and a half that followed, the market more than made up that loss, gaining more than 46 percent over that time period.

And then, of course, there was the technology, media, and telecommunications bubble of the late 1990s, with an ensuing crash in the early 2000s. The market's upward overshoot and corresponding correction can be seen in Figure 4.7.

**FIGURE 4.6** S&P 500 Index—Stock Market Crash of 1987 and Recovery (10/5/87–6/27/89)

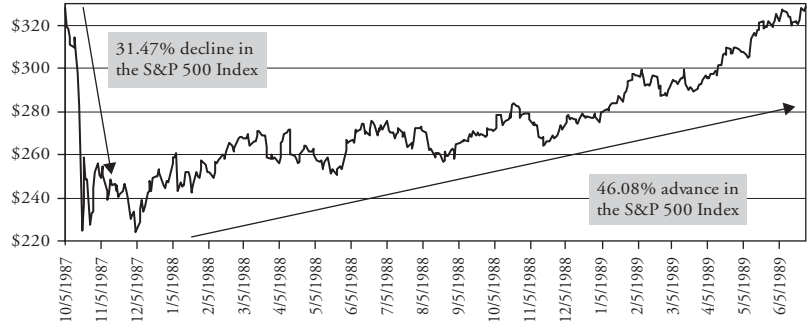
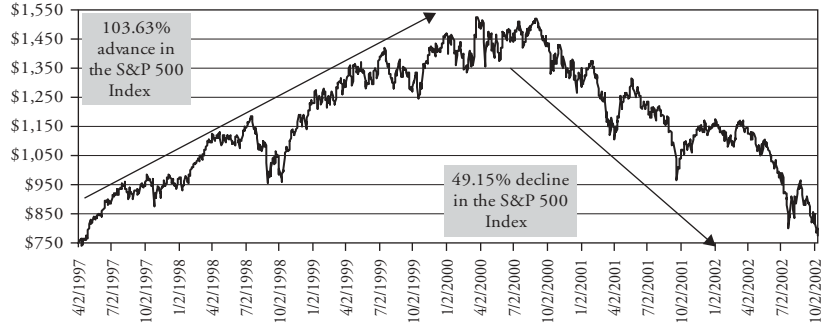



**FIGURE 4.7** S&P 500 Index—Late-1990s TMT Bubble and Crash (4/2/97–10/9/02)



In this case, the S&P 500 more than doubled in value in an approximate three-year period, and then fell back down in the two-and-a-half-year period that followed. This rise and fall was much more dramatic when looking at the Nasdaq Composite index, which, at the time, was concentrated in large-cap technology companies. The Nasdaq Composite's performance over this same time period can be seen in Figure 4.8.

In the late 1990s, the stocks that made up the Nasdaq Composite Index more than tripled in value over an approximately three-year time period. The ensuing decline was equally steep.

Finally, the most recent market crash and recovery (shown in Figure 4.9) provides another example of market overshoot to the downside, as a quick market advance upward followed the market's fall during the financial crisis.

**FIGURE 4.8** Nasdaq Composite—Late-1990s TMT Bubble and Crash (4/2/97–10/9/02)

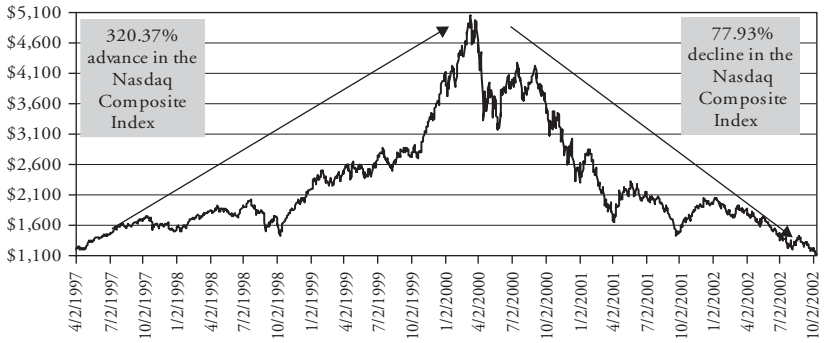
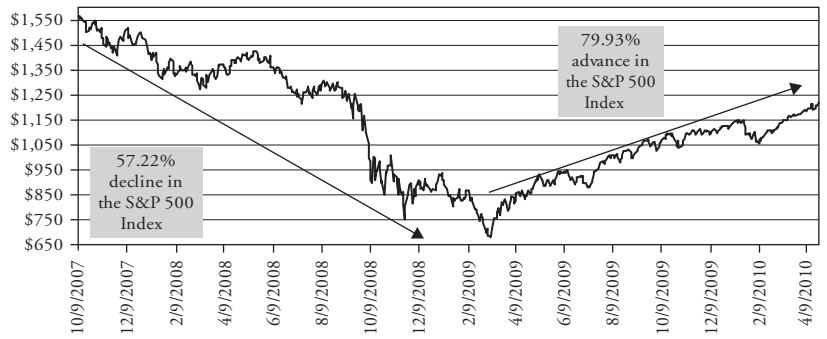



**FIGURE 4.9** S&P 500 Index—2008–2009 Market Crash and Recovery (10/9/07–4/23/10)



In less than three years, we found the S&P 500 cut in half and then regain most of the ground lost during the market crash.

These are familiar patterns of market bubbles and corresponding severe corrections, and market crashes and corresponding upward movements to correct for downward overshoot. I wouldn't argue that the market is efficient at certain points along the way, and gradually makes its way to reasonable pricing. However, these movements happen over multiyear periods and are of such sizable magnitude that one is left with the notion that markets can't possibly be giving us accurate reflections of intrinsic value. We could look at individual security performance, but the extremes would be even more severe.

## Investors vs. Their Investment . . . or Investors vs. Themselves

While I'll discuss individual behavior in the next chapter, one will find that most of the examples do not pertain to common stock investments and are constructed in environments that allow for a significant amount of control. Still, there are some studies of investor behavior that give us the sense that investors are not making rational decisions. While we are unable to pinpoint the aspect to behavior that may be resulting in faulty decision making, we can see that faulty decisions are being made.

The most comprehensive of these types of analysis examine an *investor's* return in comparison to the *investment's* return. Morningstar, the mutual fund and stock research behemoth based in Chicago, examined shareholders' dollar-weighted returns versus the total returns for the funds that they invested in. In the case where the investor held the fund and didn't make contributions or withdrawals over the entire time period, the investor's return would equal the fund's total return. However, if an investor moved money in and out of the fund over the period examined, then the investor's return would differ from the total return for the fund. The implication is that the investor is trying to time his entry and exit into the fund. While this is a loose approximation for investor timing, in the aggregate, it is probably one of the more compelling arguments pertaining to investor's actions, linking action with resulting performance in the market. See Table 4.2.

The 10-year period is an interesting period for a number of reasons, not the least of which was that it contained two significant market crashes, as well as *bounce-back* years in 2003 and 2009. It's noteworthy that the investor's return for the "Balanced" fund category actually outperformed the aggregated "Balanced" fund's total returns (presumably because investors purchased

**TABLE 4.2** Investor Performance vs. Investment Performance—December 31, 2009

| | 10-Year Total Return | 10-Year Investor Return | Difference |
|---|---|---|---|
| U.S. equity funds | 1.59% | 0.22% | –1.37% |
| International equity funds | 3.15 | 2.64 | –0.51 |
| Balanced | 2.74 | 3.36 | +0.62 |
| Alternative | 8.55 | 8.07 | –0.48 |
| Taxable bond | 5.33 | 4.00 | –1.33 |
| Municipal | 4.57 | 2.96 | –1.61 |
| All funds | 3.18 | 1.68 | –1.50 |

*Data Source:* Morningstar, Inc. Russel Kinnel, "Bad Timing Eats Away at Investor Returns," *Morningstar Fund Spy* (February 15, 2010) (http://news.morningstar.com/articlenet/article.aspx?id=325664).

more of the fund when the market was lower). As both "Taxable Bond" funds and "Municipal" funds had even greater negative differences than the equity categories, the deviation for "Balanced" funds was not simply a matter of muted volatility accruing to increased diversification. However, if one considers that market-timing moves are driven by investors who take a very active role in risk management of their overall portfolio, it could be that those who are invested in "Balanced" funds are less engaged in the overall management of their investments, preferring the portfolio managers at the funds to set their asset allocation policies. In this regard, staying invested through 2009, when one has weathered the 2008 storm, is of utmost importance. Russel Kinnel, writing in a piece related to this data set, noted that the "bear market of 2008 led to mass redemptions of equity funds just as those equity funds were primed for their best year of the decade. Ouch."[11] Ouch, indeed.

Morningstar's data is hardly alone in identifying suboptimal investor behavior. Dalbar, Inc.'s *Quantitative Analysis of Investor Behavior,* 2011 has identified a similar aggregated effect, looking at investor equity returns versus the S&P 500. It should be noted that in this examination, Dalbar considers the S&P 500 to be a proxy for the "average buy-and-hold investor,"[12] which is not truly representative but probably not far enough off to nullify the conclusions. In addition, the equity investor group contains a broad assortment of funds that contain out-of-benchmark (in this case the S&P 500) securities that will automatically cause them to differ. But, while this is a cruder examination than Morningstar's, the conclusions are worth noting and they cover an even longer time period, going back 20 years. I think this longer time frame is important, as the rolling 20-year returns are likely closer to the

**TABLE 4.3** Investor Performance vs. Investment Performance—20-Year Returns

| Period Ending December 31 | S&P 500 | Average Equity Investor | Difference |
|---|---|---|---|
| 2003 | 12.98% | 3.51% | –9.47% |
| 2004 | 13.20 | 3.70 | –9.50 |
| 2005 | 11.90 | 3.90 | –8.00 |
| 2006 | 11.80 | 4.30 | –7.50 |
| 2007 | 11.81 | 4.48 | –7.33 |
| 2008 | 8.35 | 1.87 | –6.48 |
| 2009 | 8.20 | 3.17 | –5.03 |
| 2010 | 9.14 | 3.83 | –5.31 |

*Data Source:* Dalbar, Inc., "Quantitative Analysis of Ivestor Behavior, 2011," March, 2011, p. 13.

long-run equity average, and less biased by the volatile near-term environment. In short, this is not to say that I would discount the past 10 years, but I certainly wouldn't overweight it either. See Table 4.3.

Dalbar, in its analysis of the data, hypothesizes that

> the improving results . . . were largely due to the fact that investors who entered the markets in the 90s have now experienced multiple market declines and recoveries and have learned from those experiences. They found that remaining invested has, over the long term, produced positive results.[13]

I'm not sure I would draw quite as broad a conclusion, given the methodological concerns cited previously. However, managing an investment advisory firm that advises a mutual fund, we've found, anecdotally, that investor behavior has tended to be counterproductive to long-term investing success. While we've not crunched the numbers on our own clientele, Gregg Fisher, the CIO of Gerstein Fisher in New York City, *did*, examining a total of 1,427 "households" managed by his firm. In conjunction with NYU-Polytechnic Institute professor Philip Maymin, Fisher looked at more than 650,000 notes on accounts between the years 1993 and mid-2010. Fisher and Maymin focused on the activity of clients around periods that they perceived as being more volatile or what I would define as more uncertain. They predicted that they would have client "touches" (contact via e-mail, phone, or letter) around volatile periods, and that higher trading would coincide with periods of higher "touches." The firm's own philosophy is long-term oriented, and as a matter of course, the authors predict that the

"incidence of substantial changes in investor allocation should be quite low"; however, when "aggressive trading does happen, it will coincide with a higher volume of touches."[14] It should be noted that Gerstein Fisher allocates assets to various investment strategies but doesn't manage a mutual fund specifically. As the firm directly interacts with clients in volatile market periods (as opposed to mutual funds, which often have no direct contact with shareholders), it is in a unique position to examine investor behavior in these periods. Given the conclusions cited in the Morningstar and Dalbar studies, it's not surprising that the authors conclude that, as predicted, more volatile periods coincided with more "touches" and periods of more "touches" coincided with more aggressive trading activity on the part of clients. The authors further note that "an important way that an investment advisor adds value is by restraining clients from their own tendencies to aggressively trade."

While this sentiment may be construed by some as a bit smug, I don't really think it's too off the mark. We are all looking for unbiased help when confronted with difficult situations. While there are some that believe that advisors are compensated for allocating assets and selecting managers and mutual funds to meet asset-class exposures, I think most clients recognize that an important element to any investment advisory relationship is to lead clients through difficult periods. This is, in my view a reflection of *trust* more than anything else. What do you look for in an investment advisor? One isn't inclined to seek someone to help them through periods in which they may be overcome with irrational bouts of optimism or pessimism. But what you will hear is *trust*. "I'm looking for someone I can trust." "I'm looking for someone I can trust to give me good advice."

Still, at the end of the day, the main conclusion in all of these studies appears to be that investors are often their own worst enemy. Whether this is due to investor irrationality is, I suppose, debatable. But it would appear that the academics and analysts examining these data sets, and reflecting on a rationale, do conclude that, at least in part, investors are responsible. As Karen Dolan, director of fund analysis at Morningstar, noted, your "emotional response to the market's gyrations may be one of your biggest costs as an investor."[15] Well said.

## Book-to-Market Effects and Other Value Criteria

Thus far, we've looked at individual security behavior (closed-end funds), the broad market's behavior in various time periods, and individual behavior in an aggregated, broad context. While I have not contradicted the main

empirical support for market efficiency, the inability of managers in aggregate to outperform the broad market, there is an argument to be made with regard to investment strategies as well.

For a number of years, many have pointed to the excess returns achievable from utilizing more value-oriented criteria in stock selection as a sign that markets are not truly efficient pricing mechanisms. Book value, in particular, has tended to pose a dilemma for those who adhere to a strict interpretation of market efficiency. Indeed, since Dennis Stattman's 1980 paper discussing book value and market returns[16] and exhaustive research by Eugene Fama and Kenneth French,[17] an overwhelming amount of empirical research appears to support the assertion that book value in relation to market value can be used to explain stock returns—with high book-to-market (or low price-to-book) values indicating an opportunity to realize excess returns. Dividend yields and price-to-earnings (P/E) multiples[18] have also been cited as anomalies, as high yields and low P/E multiples have been shown to provide excess returns in some studies over certain time periods.

From an efficient markets hypothesis perspective, using simple criteria such as price-to-book ratios, P/E ratios, and dividend yields as the basis for a strategy that outperforms broad market benchmarks would seem to undermine the credibility of semistrong-form efficiency. In relation to the broader Fama-Friedman arguments underpinning market efficiency, the existence of these anomalies is often directed at the first theory: the rationality of the market participants.

As researchers Lakonishok, Shleifer, and Vishny point out, ". . . value strategies yield higher returns because these strategies exploit the suboptimal behavior of the typical investor. . . ."[19] Moreover, even Eugene Fama, the principal architect of the central theory of market efficiency (with Kenneth French) points out that the price-to-book effects that seem to predict suboptimal (with respect to high price-to-book ratios) or superior (with respect to low price-to-book multiples) common stock behavior "might result from market overreaction to the relative prospects of firms."[20]

Adding credence to the theory that investor behavior appears to influence investment decision making is the performance of "winner" and "loser" portfolios constructed by Werner De Bondt and Richard Thaler. Using monthly return data for New York Stock Exchange common stocks between January 1926 and December 1982, De Bondt and Thaler constructed portfolios of "winners," or those stocks that had performed best over a given period, and portfolios of "losers," or those stocks that had performed worst over a given period. They found that "loser" portfolios of 35 stocks outperformed the broad market by an average of 19.6 percent, 36 months after the formation of

portfolios. Additionally, the authors found that the "winner" portfolios of 35 stocks underperformed the broad market by an average of 5.0 percent in the 36 months following the portfolios' formation. De Bondt and Thaler conclude that "in violation of Bayes's rule, most people 'overreact' to unexpected and dramatic news events. . . . Consistent with the predictions of the overreaction hypothesis, portfolios of prior 'losers' are found to outperform prior 'winners.'"[21] In short, valuation metrics that focus on identifying common stocks trading at a discount to their intrinsic values are, in essence, heuristics that aid us in identifying securities that have been affected by behavioral biases (or suboptimal behavior). I'll discuss these metrics in greater detail later in this book.

Would it be fair to ask why this matters? Isn't it enough to know that such anomalies exist in order to profit from the market? Yes, to a certain degree it is. One will likely benefit from behavioral inefficiencies by adhering to value-oriented heuristics such as the selection of only low price-to-book multiple stocks, or the selection of only high-dividend-yielding stocks. However, as we are human, we are not immune from the animal spirits that drive others to make poor decisions. This is a point I will emphasize over and over again. Those who believe that they are too rational to fall victim to behavioral biases will likely find that their own investment processes will be affected by this hubris at some point. Watch out for those that maintain this overconfident stance. Keep in mind that in spite of our knowledge of what works, professional money managers and mutual fund portfolio managers continue to have problems adhering to such strategies. While such strategies tend to outperform over the long run, in the short run such strategies can be very painful and test one's resolve. In short, understanding one's shortcomings as a human and understanding where our decision making has historically fallen short can only help in keeping the practitioner on the path to not only take advantage of others' irrational behavior, but not fall victim to it as well.

## Conclusions

This chapter sought to determine whether the market displays behavior that we would feel is consistent with an efficient market.

While the next two chapters will discuss the theoretical foundation for market efficiency, this chapter was focused on providing an array of individual and market examples that seem to contradict the notion that markets always provide accurate pricing of individual securities. In this chapter I've discussed individual security pricing, with an examination of closed-end

funds, and the puzzle they represent for efficient markets theorists. In addition, I've also pointed to the market's actual performance in various time periods, noting that if markets are ultimately efficient, they sure take their time in moving towards efficiency. Likewise, if investors are rational and make mistakes that are uncorrelated, it doesn't appear to show up in aggregated data on their actions during various market environments. Finally, I've ended with a discussion of value-oriented criteria and what the success of value-oriented processes reveals about the efficiency of markets.

In the end, however, this chapter offers little in way of guidance, and doesn't point specifically to the errors that humans make in decision making and how we can evaluate our own decision-making processes. This chapter has been devoted to an examination of real world decision making and the market's actual results. While I believe this examination belies notions of market efficiency, it doesn't attack the theories that underpin market efficiency in a succinct fashion. In the next chapter, I'll discuss the first of the three foundations on which market efficiency rests. However, while this chapter has been focused on real, market-based evidence of irrational market behavior, we'll find that it is not too hard to link this behavior to the behavioral errors of individuals.

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# CHAPTER 5

# Individual Decision Making

As noted in prior chapters, the arguments supporting the notion of an efficient market are convincing and appeal to our sense of fairness and reason. However, they generally fall flat when put to the test in the *real world*. Still, it's important to note that my dismissal of the efficient markets hypothesis (EMH) and market efficiency is not all-encompassing. Markets of all stripes likely result in the best allocation of resources—over the long term. Markets are generally the fairest arbiter of value—over the long term. Markets are important elements to any free society, and can be tools to guide us in how best to govern and allocate scarce resources—over the long-term.

In the short term? Not so good.

While it's true that markets will supply us with fair and accurate values in the short term, it's also true that they often do not. Consequently, there will be a great number of common stocks that will be fairly priced just as there will oftentimes be a great number of common stocks that will be overvalued (as well as those that will be undervalued). Sometimes the market as a whole will prove to be accurate and devoid of emotion. Sometimes a particular sector will be skewed, while other sectors will not be. Sometimes a particular common stock will be overvalued, while its sector appears to be fairly valued, or the market as a whole appears to be fairly valued. In short, it doesn't matter if the market is a fair assessor of value over the long term. It doesn't matter if the market is fairly valued at times. It doesn't matter if the market goes through a period of blissful efficiency. If market efficiency doesn't hold in the short run, if market efficiency doesn't hold all of the time, or at least almost all of the time, then the market is inefficient. An efficient market with caveats is not an efficient market.

So, ironically, even staunch defenders of the notion of market efficiency can supply support for those who believe human behavior distorts market efficiency. Indeed, even Burton Malkiel, a staunch defender of the efficiency of the domestic stock market, concedes that market pricing is imperfect and it's likely that behavioral factors play a part in security mispricing.[1] While Malkiel is skeptical that any can profit from anomalous pricing, his concession that short-run pricing can be egregiously incorrect is sufficient to make the case that markets are inefficient. As noted economist Andrei Shleifer observes, "'Ultimately efficient,' . . . does not mean efficient."[2] From an investor perspective, we want the long run to be efficient, and we want the short run to pose opportunities. Indeed, if in the long run pricing did not prove to be relatively efficient, setting an expectation that stocks would move towards intrinsic values would be futile or at least devoid of substantive value.

I spoke previously about the theories that underpin the EMH, as well as the hypothesis itself. As this book is principally concerned with identifying ways in which to opportunistically take advantage of market inefficiencies, it's worth examining each of the theoretical foundations that underpin market efficiency. Recall that market efficiency sits on a foundation of three theories:

- Individuals are rational beings that make self-interested choices.
- In cases where individuals behave irrationally, their *errors* are canceled out by others who take an opposing viewpoint. In other words, irrational market participants' actions are not correlated with other irrational market participants' actions.
- In cases where correlated mistakes among irrational market participants occur, arbitrageurs stand ready to rectify erroneous pricing. This group of coldly rational market participants stands ready to act quickly and decisively.

While this case is very reasonable, and appeals to our sense of how the world *should* work, as this chapter and the next unfold, we'll look at each of these points with a more skeptical eye. While this chapter is focused on the irrationality of market participants (examining the first foundation of market efficiency) we can look at market participants from a couple of different perspectives:

1. We can look at actual investor behavior and market behavior and draw conclusions about the rationality of the market (this was the thrust of Chapter 4).
2. How do individuals (who comprise the market as a whole) approach decision making—this is the theoretical evidence of investor irrationality,

and it relies on experiments that relate to investor decision making, but are not based on investor behavior specifically.

The first perspective above, discussed in the previous chapter, provides for some direct evidence of investor irrationality and market inefficiency, but it shows the symptoms, not the disease causing the symptoms. Consequently, while it offers support, it doesn't offer much insight. While I felt it was important to present the information discussed in Chapter 4, the thrust of this book is the identification of mid- to large-cap investing opportunities. To this end, it's more important to understand why we are irrational beings and what drives suboptimal decision making. In short, in my view it's insufficient to know that we make mistakes. It's more important to understand how we make mistakes and what mental shortcuts are leading us to suboptimal investment decisions.

Critiques of the latter two guardians of market efficiency (correlated mistakes and the failure of arbitrage) will be provided in the next chapter. But, again, while it's important to understand why markets are inefficient, the main point of this book is to examine how to take advantage of inefficiencies (or at least avoid making the mistakes that lead to inefficiencies). Again, in this context, it's the irrationality of market participants that's important, and much of what I'll propose later in this book speaks to human failings, as opposed to the failings of arbitrage (however, there is a point to be made with regard to arbitrage as well).

In the next section of this chapter, I'll talk briefly about decision making in general, and distinguish between decisions involving certainties and decisions involving uncertainties. Next, I'll talk about Bayesian rationality and violations of it—non-Bayesian thinking comes as a consequence of cognitive errors that we make in our decision making. After that I'll talk about some of the most important behavioral biases that appear to affect us in decision making involving the evaluation of common stocks:

- Representativeness biases
- Framing biases
- Anchoring biases

Finally, at the end of the chapter, in an appendix, I'll discuss risk and ways in which individuals generally violate maxims of rationality in approaching risky, uncertain events. This appendage is important in understanding investor behavior, but the lessons to be gleaned from this understanding lend themselves less to the analysis of mid- to large-cap stocks—the thrust of this book.

## That Thing about Our Being Rational . . .

We all like to think we are rational. Indeed, we all like to believe we are more rational than everyone else. It's telling that if one were to gather a group of individuals together in the same room and ask each one of them if they were smarter than the average person in the room, a majority would likely respond yes. While this is understandable (let's face it, self-esteem is certainly not in short supply on Wall Street or in the investing community at large), the decisions we make when faced with uncertainties are more troubling from an economist's standpoint. We start our examination of the market's inability to price securities efficiently by exploring our own cognitive failings—decision making that is more often than not prone to fits of irrationality.

As noted previously, in looking for opportunities in mid- to large-cap stocks, we must first examine the reasons why opportunities materialize. To this end, our lack of rationality in a number of situations is our starting point. This chapter is principally focused on investor rationality and how our innate behavior affects our decision making, but it is hardly exhaustive. First, it is largely focused on those behavioral anomalies that bias investor decision making, rather than a more encompassing recitation of broader human decision making or even less broad, economic decision making. Second, it is also largely focused on those cognitive errors that *I* think are most important in making investment decisions.

Another less satisfying element to this chapter may be its focus on behavioral biases that are identified through empirical research conducted in what I would term a *lab* setting. Many behavioral psychologists, behavioral economists, and other researchers studying how individuals make decisions do so with contrived examples in settings that are meant to allow for some control. I call these "lab" settings. In the world around us (the *real world!*), we may see examples of behavior that either reinforce or disprove a behavioral theory. These examples, given their unique *real-world* flavor are anecdotal and can't be used for sweeping generalizations. The lab settings that many behavioral researchers employ allows for at least some control and the ability to look at multiple or even hundreds of examples. In short, lab settings allow researchers to look at a large number of individuals and their behavior in a certain context, thus sidestepping criticisms that we are only witnessing anecdotal evidence of one individual. There is really no other way to conduct this type of research, but it does at times feel contrived. I do think, though, when we examine our own behavior, and reflect on some of the biases that have been identified, it's not too difficult to see that, yes, we do succumb to some or many behavior biases.

Also, there are many researchers working to refine theories of human behavior, but there are many that we tend to see over and over again. Daniel Kahneman, a recipient of the Nobel Memorial Prize in Economics in 2002, along with his frequent collaborator, Amos Tversky, are cited in many examples as having identified particular biases. Richard Thaler and Jack Knetsch are also considered two of the more groundbreaking academics working in this area of economic research.

However, these researchers were simply at the forefront of what has become a very interesting discipline. As we move forward in the twenty-first century, there have been numerous researchers conducting scores of experiments documenting how individuals make decisions when faced with uncertainties. For those looking for an accessible, easy-to-understand book on this subject, Duke University professor Dan Ariely's wonderful book, *Predictably Irrational: The Hidden Forces That Shape Our Decisions,* is difficult to beat.[3] Mr. Ariely's book does an admirable job describing, testing, and explaining numerous examples of behavior that belies standard, rational, serf-serving economic behavior. Mr. Ariely's book does not specifically address securities markets, but instead looks at a variety of different ways in which our rational, self-serving behavior is perverted by our simply being *human*.

But while many of Mr. Ariely's experiments would seem far removed from those affecting investor behavior, they are nonetheless worth understanding and considering in light of our own internal research processes (be they formal or *ad hoc*). Why do I think that a company has a particular intrinsic value? It likely is due to my own research, and my assumptions with regard to the company's growth prospects and its previous success. But, how are my assumptions shaped. Am I anchoring to other analyst's assumptions? Is my intrinsic value anchored to the current price of the stock—divorced from it, but not too far removed? How do management's comments and presentations affect my own assessments? The answers to these questions are not immaterial. While many experiments concerning decision making seem, as noted earlier, contrived, understanding how we make decisions when confronted with uncertainties is of utmost importance as we form our own assumptions with regard to common stocks. The topics may not be directly germane to common stock research, but the cognitive biases and human failings that they illustrate provide a greater understanding of how our own decision making can be skewed in forming assumptions.

Mr. Ariely's book is one of the newer books on decision making, and it does an excellent job with a very nuanced and difficult-to-explain subject matter, but it is not alone in terms of its ability to change one's thoughts on individual rationality. I would also point readers to Richard Thaler's

*The Winner's Curse: Paradoxes and Anomalies of Economic Life*, a compilation of behavioral insights that Thaler wrote of his own accord, or in conjunction with others.[4] These books and many others that pertain to decision making are buttressed by a variety of academic articles that further examine and investigate the anomalies that seem to undermine traditional economic thinking.

I would also note that these biases affect investors in all asset classes and subsets of the market. While I'll discuss traditional views of market mispricing in Chapter 7, there is a common perception that the pricing anomalies that one would take advantage of mainly occur in settings that have fewer investors, fewer analysts, less liquidity or other structural issues that impede efficient and thorough research. This couldn't be further from the truth. Opportunities are present in mid-cap and large-cap stocks. However, mid- to large-cap opportunities do not present themselves due to what I term structural impediments (such as lack of analyst coverage), but rather, due to behavioral biases that are ubiquitous. I'll delve into this point in greater detail in further chapters. This chapter is about the omnipresent, behavioral errors that pervert our decision making. In the following examination of some of the more important cognitive errors that affect us, we learn that we, as humans, are irrational in our decision making much of the time. Not only do we find ourselves reliant on imperfect mental shortcuts, but our resulting outcomes make us more prone to fits of despair and euphoria.

Before I discuss some of the more common cognitive biases that we, as humans, tend to make, it's important to note that we are generally logical and rational actors when it comes to factual, certain statements (or decisions resulting from such statements). Unfortunately, not all of the questions that we are forced to answer in life are of this nature. Renowned behavioral psychologist, Daniel Kahneman distinguishes between two generic modes of cognitive operation: reasoning and intuition.[5] Kahneman explains that reasoning concerns decision making that is more factual and certain in nature: the answer to a problem involving addition or multiplication, filling out a form, or ascertaining how to get from one location to another using a map. Intuition pertains to our decision making when we encounter a situation that contains an element of uncertainty. Our cognitive errors do not generally concern certainties such as simple mathematics or filling out steps in a process, or understanding the components of free cash flow. Our errors generally accrue to decisions that require us to cognitively account for uncertainties. To make decisions that require us to deal with uncertainty we generally use intuition or mental shortcuts. But, in some more complex cases—like the assessment of a company's prospects in the future – such shortcuts can be laden with biases that are far from reasonable.

The issues that we confront in making decisions based on uncertainties are twofold: (1) we have a variety of inherent behavioral biases, as discussed, that intertwine and undermine our assessment of basic assumptions underlying intrinsic value; and (2) we have the complex interaction of a number of uncertain variables. In short, we have a lot of balls in the air at the same time. We have macroeconomic assessments that affect overall demand by consumers and businesses. We have microeconomic forces that must be reckoned with in some fashion and worked into assessments. We have the aforementioned behavioral biases. We have a number of company specific issues that are neither microeconomic nor operations related, but are nonetheless important: management, compensation, aligned interests, and so on. All of these uncertainties are to varying degrees probable, improbable, or indeterminable. But they must be synthesized and addressed in an encompassing manner that results in a fair value for the company. Most competent professional analysts and indeed even amateur practitioners have a fairly solid grasp of probabilities and basic statistical inferences. However, when posed with less intuitive, complex interactions of uncertainties, the heuristics that one uses in everyday life are generally insufficient. Moreover, the calculations themselves can be difficult and not easy to understand.

To summarize, we have fairly complex interactions of uncertainties and we have behavioral biases that affect the shortcuts we mentally take to arrive at conclusions based on these complex interactions. These two problematic decision-making points are interrelated but different. The first (complex interactions) is exacerbated by the second (behavioral errors) but also dependent on the second. In order to understand this interaction better, a good starting point is to first examine a common statistical inference that involves reasoning with uncertain statements: Bayesian inference. Bayesian inferences tend to be difficult for many individuals to solve using intuition, and our general failure to conform to Bayes's rule is yet another indication that we are not too adept at making decisions involving more complex uncertainties. Then, as the chapter continues to unfold, we'll refer back to the manner in which some of the cognitive errors are non-Bayesian. In this way, the interactions and relatedness of these two elements to decision making will hopefully become clear—and help one in their own decision making.

## Bayesian, Non-Bayesian—What Does This Mean?

Often, in discussing economic decision making, one will hear a situation or a group of test subjects referred to as non-Bayesian. Non-Bayesian, in this

sense, is often used as a descriptive term to refer to someone who, in general, does not act rationally with regard to making economic decisions. For example, in his wonderful book discussing the inefficiency of markets, Andrei Shleifer explains that "individuals systematically violate Bayes's rule and other maxims of probability theory."[6]

Bayesian reasoning is not new. While the term *Bayesian* seems very much in vogue at the present time, its origin is Thomas Bayes, a Presbyterian minister and mathematician from England who formulated a theorem we now refer to as Bayes's theorem. While Bayesian probability and Bayesian reasoning experienced a rebirth in the 1950s, as economists and decision science started to examine the role of individual rationality on markets, Bayes's theorem was formulated in the eighteenth century.

So what is Bayes's theorem? Bayes's theorem is a formula (see 5.1):

$$P(A|B) = \frac{P(B|A)*P(A)}{P(B)} \qquad 5.1$$

Where
P(A|B) is the conditional probability of A, given B.
P(A) is a prior probability of A, but does not take into account B.
P(B) is the prior probability of B.
P(B|A) is the conditional probability of B, given A.

This is hardly intuitive, so an example may serve to clarify the essence of these relationships. One of my favorite examples that has some empirical research associated with it, pertains to breast cancer and preventative screening:

> The probability of breast cancer is 1% for a woman at age forty who participates in routine screening. If a woman has breast cancer, the probability is 80% that she will get a positive mammography. If a woman does not have breast cancer, the probability is 9.69% that she will also get a positive mammography. A woman in this age group had a positive mammography in a routine screening. What is the probability that she actually has breast cancer?[7]

In terms of Bayes's theorem, we are looking for the probability of cancer (A), given a positive test for cancer (B). This is a conditional probability, as the probability of cancer (A), is conditioned on the test (B), and is thus written P(A|B). It could as easily have been written Probability (of cancer | given a positive test for cancer in a mammography).

In this example, the prior probability of breast cancer, P(A) is 1 percent—this could also have been written Probability (of cancer). It is unrelated to the test that was given. A positive or negative result on a test for cancer does

not change this probability. If a patient has breast cancer, and tests positive in screening (in other words, the conditional probability of having a positive test for cancer, given that the patient has cancer) is 80 percent—this is P(B|A). In other words, the Probability (of testing positive for breast cancer in a mammography | given that the person has breast cancer). This is not a random number, as it's conditioned on the person having breast cancer—the test only tells us so much, as it's related to a person having breast cancer, not the general population. These are the two components of the numerator in Bayes's theorem.

The denominator of Bayes's theorem is a bit more complex. The Probability (of having tested positive for breast cancer), or P(B), is predicated on both real positive tests (for that 1 percent of the population) and false positive tests (for the other 99 percent of the population). We arrive at this total number of positive tests, by adding the true positives (1 percent × 80 percent) to the false positives (99 percent × 9.69 percent):

$$(0.01)(0.80) + (0.99)(0.096) = 0.008 + 0.09504 = 0.10304$$

There are a couple of things to point out about the denominator (or the likelihood of having tested positive for breast cancer in a mammography) in this example. One, the likelihood of a false positive test, at 9.504 percent is much higher than the likelihood of having a true positive test, at 0.800 percent. Consequently, the overall likelihood of a positive test for breast cancer when taking a mammography is quite high (do to the false positive test of 9.504 percent), at 10.304 percent.

Putting our numerator and denominator together, we get:

$$\text{The Probability of Breast Cancer, Given a Positive Test in a Mammography} = \frac{0.80 * 0.01}{0.103} = 0.07764, \text{ or } 7.764\%$$

Alternatively, the equation could have been written with more detail as it pertains to the denominator:

$$\text{The Probability of Breast Cancer, Given a Positive Test in a Mammography} = \frac{0.80 * 0.01}{(0.01) * (0.80) + (0.99) * (0.096)} = 0.07764, \text{ or } 7.764\%$$

The likelihood of cancer given a positive test in a mammography screening, which generally shows a positive test 80 percent of the time when the patient has cancer, is 7.764 percent. Often, this strikes most people as rather low. Indeed, Eddy found that 95 out of 100 physicians estimated that this figure would fall between 70 percent and 80 percent.[8]

Probabilities are not easy to calculate. Most individuals have problems with fairly simple interactions among uncertain events. The complexity of the world and the events that surround the world lead to situations in which individuals either revert to heuristics, or flat out disregard maxims of probability.

While Bayes's theorem is an interesting example of our general inability to properly assess probabilities and examine data, it is nonetheless directly relevant to many forecasting errors that present themselves in the course of researching common stocks. Much of the overoptimism or overpessimism that we see in forecasts of future events (including long-term earnings) emanate from heuristics and cognitive errors that give rise to violations of Bayes's theorem. In this sense, the term *non-Bayesian* is a more general classification of decision-making processes that lead to violations in Bayes's rule. The more important element to this type of classification is that it emanates from uncertainty—and our assessment of uncertain events.

But while it's important to understand and see how probability maxims are violated when pertaining to specific calculations, violation of Bayes's theorem is a result of cognitive biases, rather than a specific bias in itself. No one sets out to violate maxims of probability, but we do see complex situations and when we revert to heuristics in these situations, the result is non-Bayesian.

Next, let's look at a sampling of cognitive errors that we make in our daily lives, and in the course of researching common stocks.

## Great Companies Always Make Great Stocks

Well . . . not quite. In fact, I would argue that many times that's not the case! One of the more important errors we make in our decision making involves using representativeness short-cuts to arrive at decisions on more complex matters. In my experience, perception and reality oftentimes collide in investing, and they do so under representativeness biases. In the late 1990s, many telecommunications and technology stocks looked like relatively safe investments, with earnings increasing on a regular basis (over almost a decade

in some cases). Later at the start of the new century, homes and real estate seemed to offer unparalleled safety and stability (as well as returns). Today, social networking companies and commodities like gold seem to do no wrong.

We have a tendency to apply inappropriate probabilities to outcomes, based upon the recent past. The recent past becomes *representative* of the future. In terms of rationality, a Bayesian view would not be predicated on the recent past, but on a fair assessment of the situation and outcomes. Technology has tended to be an area that is especially prone to these types of biases, as technology evolves relatively easily and frequently. However, any model that is built on a past time series of data can become skewed by this bias.

Representativeness is a broad classification of behavioral heuristics that rely on the representativeness of unrelated or semirelated data to guide us in evaluating an uncertainty. There are numerous examples of representativeness heuristics at work, and it's worthwhile discussing variations on this theme in order to understand the various ways in which our behavior is being shaped.

A common behavioral study would describe an individual in terms that are very stereotypical. For example, Kahneman and Tversky have used the following example in their work in this area:

> Steve is very shy and withdrawn, invariably helpful, but with little interest in people or in the world of reality. A meek and tidy soul, he has a need for order and structure, and a passion for detail.[9]

In their study, the authors then ask participants if Steve is most likely a:

1. Farmer
2. Salesman
3. Airline pilot
4. Librarian
5. Physician

More often than not, participants in these types of studies would select librarian. The description is representative of what we perceive a librarian to be like, so we follow our instincts and select librarian. However, in utilizing this heuristic, individuals have disregarded an array of other information that should shape our decision making. One in particular is the fact that there are far more farmers and salesmen in the world than there are librarians (a base-rate rejection that violates Bayes's rule!).

Kahneman and Tversky provided an even more revealing examination of representativeness biases several years later, when they used a series of questions to examine whether respondents would violate a basic law of probability. The question below is one of a number that the authors used in their study:

> Linda is 31 years old, single, outspoken and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.[10]

The authors then asked which of the two alternatives below is more probable:

1. Linda is a bank teller.
2. Linda is a bank teller and is active in the feminist movement.

Note that the probability of 2 must be lower than 1, as the probability of a conjunction cannot exceed the probability of the constituents (in the question above, "bank teller" is a constituent of a conjunction involving "bank teller" and "active in the feminist movement"). However, the question was constructed to make a description of Linda representative of a feminist. Asking this question of 142 undergraduate students at the University of British Columbia, Kahneman and Tversky found that 85 percent of respondents selected option 2. This was not a singular case, and several other studies (by the authors and others) have been conducted offering similar results.

Making this more concrete, let's consider two companies. The first is a company that is beset by management turnover; the company's sales have recently missed expectations and its stock has moved lower by 30 percent over the past six months. The second company has had an uninterrupted string of consecutive earnings growth, has had stable management, and its stock has doubled over the past year. Which company is the better investment? The gut reaction from many would be the company with stable management, growing earnings and a stock price that has been trending upward. But, in truth, while stable management and growing earnings are important factors to consider, they are not singularly reasons to invest in a stock. Indeed, it is often the case that the poorer-performing stock is the better value, and thus it makes the better investment. Good-performing companies represent good stocks to most individuals and market pundits. This tendency to voice approval for a company that has been performing well recently is another example of representativeness.

## Representative Sequences

In a related manner, representative sequences also induce investors to make cognitive errors that result in poor decision making. In particular, representative sequences appear to pose a tremendous problem for stock research analysts.

In our effort to decipher the future, we look for clues. We don't want to believe that eventually companies with competitive advantages are unable to sustain long runs of abnormal growth. We don't want to accept that even goods that benefit from a fair amount of monopolistic competition struggle to maintain an advantage over the long run. Currently, we think that Facebook might be on to something, and we fully believe that Apple Computer will always produce beautiful and functional products.

In truth, we have a tendency to look at short sequences of data—be they returns on equity, annual growth rates, or other fundamental factors—and extrapolate longer-term sequences from this data. The past data becomes representative of the future data. This is similar to the way in which we approach data that we know to be random. Our expectations with regard to the data become set and then our forecasts are shaped by whatever expectation we've established. With regard to events that we know to be random, we see this in both the *gambler's fallacy* and *hot hand beliefs*, two behavioral flaws that have been identified numerous times in the examination of the way in which gamblers approach uncertain outcomes.

In 1974, Kahneman and Tversky famously noted that with a flip of a coin, individuals "regard the sequence H-T-H-T-T-H to be more likely than the sequence H-H-H-T-T-T, which does not appear random, and also more likely than the sequence H-H-H-H-T-H, which does not represent the fairness of the coin."[11] In a variation of these expectations, a gambler may expect after a string of heads that a tails is *due*. This is the *gambler's fallacy*—an expectation that individual random events are linked, rather than discrete.

While not the inverse of this notion, an opposite viewpoint can pervade one's thinking. When a gambler is winning on the flip of heads, and experiences H-H-H-H-H, they may expect that they will again hit heads, since they have a *hot hand*. This is significantly different than the gambler's fallacy. The gambler's fallacy is based on expectations of a chance event, and the likely outcome. The hot hand belief is based on one's impression of their own luck—not the chance of the event. Thus, both tendencies can work in tandem, as one can expect an outcome, and also expect that their hot hand will continue by betting on that outcome.[12]

**TABLE 5.1** CSCO's Actual Growth Rates in Net Income and Sales, and Returns on Equity

| For the Year Ending at Month-End in July | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|---|---|---|
| YOY rate of growth in revenue | 162.53% | 85.40% | 91.10% | 105.6% | 67.31% | 83.46% | 57.52% | 31.57% | 43.40% |
| YOY rate of growth in net income | 210.62% | 95.35% | 103.77% | 87.83% | 41.34% | 100.00% | 15.12% | 26.64% | 51.99% |
| Return on equity | 43.91% | 45.23% | 44.83% | 45.30% | 37.01% | 41.63% | 29.40% | 23.09% | 21.29% |

While the work of Kahneman and Tversky applied to random sequences, there is no reason that a similar cognitive bias does not pervade nonrandom sequences. In this sense, a long string of losses or a long string of profits is thought to supersede our general knowledge of microeconomic theory. Thus, we think, due to the pattern that has been established that "this company is different." This is akin to the "new paradigm" thinking that appears to rear its ugly head from time to time. At the end of the 1990s it was with regard to the Internet and the various companies that were profiting from it. In the early 2000s the real estate market was different. At the present time, the belief is that consumption is changed forever—a reverberation of the Great Recession.

For example, it may be that a company has had a string of earnings surprises or abnormal rates of growth. The tendency is to look at this data and extrapolate from it that there's a pattern—and that this pattern will continue. Whether this is due to a tendency to put too much faith in a relatively small sample of data or the thought that management has a hot hand in the management of their product offerings within a market, is likely irrelevant. Both are default mechanisms that emanate from representativeness heuristics. Consider Cisco Systems, Inc. (CSCO) in the late 1990s. In the 1990s, CSCO had produced a stellar track record of earnings and revenue growth, as found in Table 5.1.

From a behavioral standpoint, it is easy to look at a very successful firm and expect their success to continue for an indefinite, or at least abnormally long, period of time. This variation on the representativeness heuristic is a tendency to accept *a priori* data from a relatively small data set, and overestimate a company's ability to replicate such results over a longer time horizon.[13]

At the end of CSCO's fiscal year in 1999, the company had established an enviable track record of revenue and earnings growth. Indeed, with a nine-year (CSCO went public in 1990) average annual rate of growth in both revenues and net income of in excess of 80 percent per year, there was little to not like about a profitable high-tech company in a sea of money-losing newcomers.

But while there was no question that CSCO was well run, had technology in demand, and was a market leader in many of its businesses, these were not the questions that were of utmost importance in an evaluation of the company. Keep in mind that it is easy to construct a valuation model that gives you a valuation that is not dissimilar from the current valuation, or even above the current valuation (for any company). And if you looked at the track record that CSCO had established, what would you estimate the

next few years of earnings at? With hindsight, this example is fairly clear. However, knowing that we, as humans, are subject to representativeness heuristics, and knowing that the period of the late 1990s was beset by new paradigm thinking, it is fairly clear that the invisible forces of behavioral biases were at work. In this context, it's understandable that research analysts took the near-term results of CSCO and extrapolated a longer-term view of the company, forgetting that the world continues to be generally subject to a variety of economic phenomenon that will work to undermine any success story. Indeed, the longer the success story, the more apt that the predictions will veer wildly from a reasonable assessment. I'll take a closer look at CSCO later in this book in further examples.

CSCO hardly serves as the only example, and while the late 1990s presented a wide array of examples of representative biases resulting in overly optimistic forecasts, there are alternative examples of overly pessimistic assessments, based on near-term data sequences. In the late 1990s, oil and gas service companies appeared very undervalued, as many investors viewed their prospects through the lens of near-term oil prices. In spite of a fairly solid balance sheet and significant liquidity, Ford Motor Company's prospects at the height of the 2008–2009 recession was viewed in terms of a near term cyclical event, rather than a longer-term Bayesian assessment of automotive demand. As I write this book, I can't help but think that very large financial firms in 2011 are being viewed through the prism of near-term defaults and operating performance, rather than a more encompassing and realistic view of earnings in the future.

However, in the end, many of these examples that I've cited are anecdotal and do not, in and of themselves, prove that individuals are subject to representativeness biases. However, we know from the lab-based experiments that many researchers have conducted, that individuals do fall victim to representativeness biases. Consequently, it's not a great leap to presume that such biases would affect individual investment decision making as well.

In my estimation, no other cognitive error accounts for as many different paths to errors in investing judgment as representativeness biases. This bias can affect our initial view of a company and its stock in simple terms. It can also taint our examination of intrinsic value via estimates for short and long-term growth and it can influence our judgment in our interactions with company management. No other error has such a profound effect on investment decision making. I'll revisit our methods for avoiding this error later in the book. For now, it's sufficient to note that we are subject to this error, it is irrational, it leads to non-Bayesian reasoning, and there are signs that research analysts fall victim to these tendencies on a regular basis.

## Now That You Put It That Way . . .

Sometimes, my daughter will demand something, for example, music in the car, without the least bit of sensitivity: "Turn on the music," she will demand. Other times, she's quite sweet: "Daddy, can I please listen to some music?" Anyone with children understands that the way in which our child frames his or her questions, demands, or desires affects our view of them, and our response. Framing, in this respect, is very powerful, as it is difficult to turn down or ignore a gracious question or demand, while more curt demands are easy to simply deny. However, while these relatively innocuous situations may pose decision-making dilemmas for parents from time to time, they're relatively narrow in scope and effect. Framing effects, as they pertain to stock research or more generalized decision making, are a bit more insidious and obviously have wider effects on individual wealth or even the behavior of the stock market as a whole.

Our general decision making shouldn't be affected by the way in which questions are framed, or situations are presented. Unfortunately, this idealized notion of rationality doesn't hold in a variety of situations. Daniel Kahneman and Amos Tversky first recognized that the reference point that an individual considers in relation to their decision making could have a profound impact on their ultimate decision. This was an extension of "Prospect Theory: An Analysis of Decision under Risk,"[14] their influential paper on the inconsistencies that humans make in deciding between risky prospects. As individuals' inconsistent attitudes toward risk likely leads to suboptimal behavior in investment markets, I'll talk about this seminal paper in greater detail in an appendix to this chapter. For now, let's consider reference points. Generally, it is thought that one's current assets serve as a reference point for most of decision making. When we decide whether to do something, such as purchase a ticket to a University of Texas football game, it is thought that we evaluate such a decision based upon our current level of assets. While this certainly may be true in singular events such as the one described, Kahneman and Tversky found that in more complex situations, involving a *compound outcome,* the frame of the dilemma will affect the decision.[15] Let's say that you purchased a ticket to a football game for $40 and then go to the game. However, when you arrive at the game you look into your wallet and find that you've lost the ticket. Do you purchase a new ticket? Alternatively, let's say you are going to the game, and you plan to purchase a $40 ticket at the game. You arrive at the game, and open your wallet expecting to see $40. You find nothing and presume that you've lost the $40 along the way, or someone has stolen it from you. Do you still purchase the $40 ticket at the football

game with a credit card? While your overall asset base is affected in the same way in both situations, Kahneman and Tversky found that individuals' decision making was very different in each situation. Let's look at response rates to two similar questions that the authors posed to test subjects in an examination of framing:

> Imagine that you have decided to see a play where admission is $10 per ticket. As you enter the theater you discover that you have lost a $10 bill.
>
> Would you still pay $10 for a ticket for the play?[16]

The authors found that out of the 183 individuals who were asked this question, 88 percent said "yes" they would purchase a ticket, while 12 percent said "no."

The authors then asked the following question:

> Imagine that you have decided to see a play and paid the admission price of $10 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered.
>
> Would you pay $10 for another ticket?

In this case the authors found that 46 percent said "yes" they would purchase another ticket for $10, while 54 percent said "no" they would not purchase another ticket. From an economist's standpoint, these two examples, with their differing responses, are problematic. They do not represent rational decision making. The wealth effects of the two situations are the same, yet the decision making on the part of participants varies dramatically.

Framing covers a broad array of cognitive errors, with the outcomes dictating a specific heuristic employed when faced with the inferences that framing forces us to consider. Sometimes we revert to heuristics that correspond to mental "accounts" that we set up for certain framed questions. For example, we may have a mental account that corresponds to theater tickets or football tickets. While we may recognize that losing a $10 ticket and losing $10 in cash essentially affect our overall wealth the same way, we may have mentally allotted $10 to "tickets," so when we reach that amount in our "account," we are reluctant to spend more money to purchase more tickets, regardless as to the circumstances. Is this rational? Well, truly not. One should consider their total current asset base in making decisions. They should frame questions in a perspective that is wide and encompassing of all of the options that are available to them. They shouldn't narrow their perspective and place certain decisions in specific mental accounts.

Aggregated wealth or segregated wealth (mental accounting) is only one type of frame. Another type of frame concerns aggregated time versus segregated time. Think of a decision that unfolds over the course of a year. Does one's decision-making change depending on whether one makes one decision and is forced to stick with it for a year, or instead is forced to revisit the decision on a quarterly basis (even if the ultimate outcome is not expected to change)? Does the *ability* to take a short-term perspective, impede a longer-term perspective, even if we know the long-term perspective is the rational perspective? Daniel Kahneman and Dan Lovallo refer to a generalized form of this as *narrow framing*.[17] From this perspective, looking at narrow frames, such as short time frames in a longer horizon, will result in cognitive errors. As they explain, "People tend to consider decision problems one at a time, often isolating the current problem from other choices that may be pending, as well as from future opportunities to make similar decisions." This is relevant to investments as we have a general return expectation that is predicated on a long-term horizon, but we are continually faced with short-term opportunities to make decisions. Given month-to-month volatility in investment markets, and the low cost of changing investment decisions, there is ample opportunity to change one's decision, regardless as to whether one's long-term horizon has changed.

Richard Thaler, Amos Tversky, Daniel Kahneman, and Alan Schwartz[18] examined what they termed the *effect of myopic loss aversion* in a study conducted to see if myopia affects one's risk aversion. The authors ultimately sought to determine if an imposed shortsighted view of two different (but volatile) assets results in an ultimately different acceptance of risk, as it pertains to making an investment decision. In an examination of 80 undergraduate students at the University of California at Berkeley, students were tasked with serving as portfolio managers and investing a college endowment between two different funds. The students were paid for this experiment and were told that their earnings would be predicated on the performance of their investment choices. In this experiment the students were not told that one fund contained stocks and one fund contained bonds and they were not given return and volatility data. Instead, they were expected to "learn" about these attributes through successive trial and error. The bond fund's data were drawn from a normal distribution with a mean return per period of 0.25 percent and a standard deviation of 0.177 percent (a distribution with less likelihood of providing negative returns in any given period), while the stock fund's data were drawn from a normal distribution with a mean return of 1.00 percent and a standard deviation of 3.54 percent (a distribution that commonly provided negative returns

in any given period). Each student was randomly assigned to one of four conditions:

- "Monthly" condition: Students made 200 decisions, each corresponding to a single period.
- "Yearly" condition: Students made 25 decisions, each binding the student to eight periods.[19]
- "Five-yearly" condition: Students made five decisions, each binding the student to 40 periods.
- "Inflated monthly" condition: Same as "monthly" condition, but returns were inflated by 10 percent (however, students were told that there was a high rate of inflation that was responsible for returns always being positive).

The students in the "monthly" condition received monthly returns, but the students in the "yearly" condition received the same returns, linked together. Thus, all of the students received the same returns (save the "inflated monthly" condition); however, the returns given to the longer-duration, decision-making groups were aggregated, so the affects of volatility were less pronounced. At the end, a 100 percent allocation to one fund (be it the stock fund or the bond fund) would be the same regardless as to the group that the student was assigned to. The difference would be that the groups were making a different number of decisions and were seeing more data more frequently. At the end of the exercise, the students were asked to provide a final allocation between the two funds.

The idea behind this study was to see how individuals behaved when they were faced with frequent information interaction and frequent decision making. Think of how individuals make investment decisions today versus 30 years ago. Today, we have access to online brokerages and if we want we can look at our accounts in real time, second by second. Thirty years ago, one might view their investments on a monthly basis, and not have such information at their disposal. I think we can also view this research through the prism of investment process. Some processes are prone to higher turnover, with more buying and selling, and consequently more decision making. But does having more frequent information, or having a shorter investment horizon, change the way that we approach the decisions that we make? Note that *investment* horizon, in this context is different from *investor* horizon. The presumption in these cases, and the example above, is that one's risk profile is consistent. In other words, the amount of risk that one accepts is not predicated on the frequency with which one views data or revisits decisions. In short, the authors attempted to determine if decision-making frequency affected the manner in which individuals made decisions, and whether frequency caused

individuals to change their ultimate risk tolerance. The group averages for the final recommended allocation (after the students had been "experiencing" the volatility of the game) are presented in Table 5.2.

Note that the recommended allocation to bonds for those who were revisiting the allocation on a monthly basis is nearly twice that of the other groups. The inflated monthly numbers, recall, are simply monthly returns inflated by 10 percent. This inflation results in no negative months for the stock fund, whereas, in the absence of this inflation, 39 percent of the monthly trials were negative for the stock fund. As one can infer, in the absence of negative months, individuals are content with a higher proportion in stocks, even with volatility (so long as such volatility results in positive returns!). However, while this tells us something about how individuals approach risky situations, it is hardly realistic. The real take-away is that when individuals are confronted with constant decision making in an uncertain environment, they will turn increasingly risk averse. Note that risk aversion should not be based on the frequency with which one is visiting and revisiting decisions, but should instead be based on the expected returns and risk of the assets, as well as the underlying risk tolerance of the individual (over their entire time horizon, not just in the segregated short time periods).

Now, consider this study in relation to the current market environment and the frequency with which individuals visit and revisit decisions—be they professional portfolio managers or amateur practitioners. Outside of the world of private equity investments in private companies, which are illiquid and can't be disposed of quickly, portfolio managers examine decisions on a daily basis, if not more frequently. Does this result in suboptimal behavior? It would be surprising if it did not.

We've now considered framing with regard to aggregated assets versus segregated assets, and framing with regard to the frequency with which we

**TABLE 5.2** Average Final Recommended Allocation to Stock Fund and Bond Fund for Each Group After Experience

| Group of Students | Allocation to Bond Fund | Allocation to Stock Fund |
|---|---|---|
| "Monthly" condition | 59.1% | 40.9% |
| "Yearly" condition | 30.4% | 69.6% |
| "Five-yearly" condition | 33.8% | 66.2% |
| "Inflated monthly" condition | 27.6% | 72.4% |

Adapted from panel "A" of Table 1 in Richard Thaler, Amos Tversky, Daniel Kahneman, and Alan Schwartz, "The Effect of Myopia and Loss Aversion on Risk Taking: An Experimental Test," *Quarterly Journal of Economics* 112(2) (May 1997):654.

are allowed to make decisions. Another framing bias concerns the availability of options, regardless as to their similarity, and how simply having variety changes the way in which we frame decisions.

If I present my daughter with a variety of treats (say small candy bars) in separate piles she will generally choose one of each—even if I tell her she has to wait to consume them over a multiday period (i.e., one treat per night). However, if I give her an option to select one treat and repeat this option nightly, she tends to select the same option over and over again, each night. She's not alone, and indeed, in an interesting study of children, most children tend to react in a similar fashion.[20] Indeed, most college students act in the same manner,[21] as do, I would suspect, most adults. We like variety and choose variety when it is presented to us. However, we tend to make different choices when we keep going back at different intervals. Choice is appealing, and when confronted with an array of choices and the need to make a decision, we tend to decide to partake in a little of everything. While this makes for a more varied and interesting life, from an investing perspective it can pose a number of problems. When presented with a variety of investment options, what do individuals tend to do? Secondarily, do their decisions conform to their overall risk levels, or do they make decisions that don't collectively add up?

In 2001, Shlomo Benartzi and Richard Thaler attempted to answer these questions by examining a database of 170 defined contribution retirement plans (mostly 401(k) plans), with 1.56 million participants.[22] While the number of options in each individual retirement plan in their study differed, on average each plan had 6.8 options available. With this data, the authors sought to determine whether participants in retirement plans adhered to what they termed a *1/*n *heuristic*. The 1/*n* heuristic is a variation of the diversification heuristic cited by Read and Loewenstein (1975). It proposes that one's allocation to each of the mutual fund options in a 401(k) plan will approximate 1/*n*, where *n* equals the number of fund options. In other words, if one has two mutual fund options in their 401(k) plan—an equity option and a bond option—then individuals will allocate, on average, 50 percent to the equity fund and 50 percent to the bond fund. Alternatively, if one has 10 mutual fund options in their 401(k) plan, they will allocate 10 percent to each of the funds on average. This is a variation on the tendency found by Read and Loewenstein[23] to take advantage of the array of choices by sampling equally from each choice. But is this rational? Of course not. One's allocation to various asset classes should be predicated on their age and risk tolerance, not on the number of fund choices available. Generally, as the number of fund choices in 401(k) plans increase, the number of equity fund choices

increases more dramatically, as the variants in equity strategies offer more avenues for differentiated investments than the variants in bond strategies. However, if one's risk tolerance and age would dictate that approximately 50 percent of their portfolio be allocated to high-quality bonds, then whether their plan was comprised of two mutual funds or three mutual funds, their allocation to high-quality bonds should remain 50 percent.

While Benartzi and Thaler admit that the aggregated data provide a crude test of the 1/*n* heuristic, it nonetheless supports the assertion that the authors originally proposed. In their analysis, the authors found that the allocation of assets within the plans roughly corresponded to the array of fund choices devoted to predominantly equity investments and predominantly bond investments. As each plan contained a different number of funds (recall 6.8 funds on average), they simply categorized each fund as an equity fund or a bond fund. Recall from Chapter 2 that, given the more certain nature of bond cash flows, their riskiness is far less than other more uncertain investments. In this way, bonds will generally drive the overall riskiness of an investment allocation. Benartzi and Thaler found that, in aggregate, 61.76 percent of the fund choices in retirement plans were equity mutual fund options and 62.22 percent of the assets were allocated to the equity mutual fund options.[24] If the average plan had 10 mutual fund options, then the average plan had 6.2 equity mutual fund options. Moreover, for every $10 invested in the 10 mutual fund options, $6.22 is devoted to the equity mutual fund choices.

The authors also conducted a lab-based questionnaire of University of California employees and received results similar to the results provided by an analysis of the retirement plan data cited earlier. Moreover, Benartzi and Thaler examined two very different retirement plans specifically, the University of California retirement savings plan and the TWA Pilots Directed Account Plan/401(k). The University of California plan consisted of one stock fund and four bond funds. The TWA Pilots plan consisted of five stock funds and one bond fund. The results? On average, participants in the University of California plan invested 34 percent in the stock funds, while participants in the TWA Pilots plan invested 75 percent in the stock funds.

It's unlikely that the results cited in the aforementioned studies are happenstance. The greater take-away is that choices affect us. The number of choices available at a time of purchase affects our decision making with regard to the purchase. While the investing ramifications, more broadly, are important in the Thaler/Benartzi study on retirement plans, it is not a leap to presume that this effect, what Read and Loewenstein describe as the *diversification heuristic,* is applicable to a number of investment situations. Some investment strategies target a number of stocks to hold in their portfolios.

How do they determine the weightings? Some investors examine past data on earnings growth or returns on equity. How do they weight the importance of each of these data points? When confronted with complex questions that force us to deal with uncertainties, we often revert to simplified heuristics in order to arrive at conclusions.

Before I move on, I do think it is useful to examine one additional type of framing that's very germane to stock research, but falls outside of the more generalized decision-making frames discussed earlier. While I'll discuss the importance of intermediaries or "experts" in influencing herd behavior in Chapter 6, it is important to note that information that we accumulate in the analysis of common stocks can be framed in ways that can have dramatic effects on our underlying valuations. While we tend to see less reasonable framing of information in times of market euphoria and market despair, it's reasonable to expect that much of the information that we accumulate must be examined with a critical eye, regardless as to the market or industry environment.

I'll propose later in this book that stocks don't necessarily need to be "framed" in the context of industry or sector. A company is a company. Of paramount importance is a company's ability to maintain or grow cash flow—it really doesn't matter what the industry is. However, in assessing growth, we often do look at industry competitors and other industry data, so it can be difficult to avoid industry frames and the framing that other analysts do in the course of their own research—or in trying to sway or influence others. To this end, Daniel Beunza and Raghu Garud cite the use of what they refer to as *calculative frames* in the underlying analysis of Internet stocks.[25] Beunza and Garud view "analysts as *frame makers,* specialized intermediaries that help investors attach numerical measures of value to stocks even in contexts of extreme uncertainty. . . ."[26] The authors explain that from a sociological perspective, analysts serve as important intermediaries, and in that regard they are *frame makers*, often setting the stage for how others view a particular company. In their analysis of Amazon.com, Beunza and Garud explain that an important calculative frame for the company regarded its industry classification. Analysts covering the company would come to very different conclusions with regard to Amazon.com, depending on whether the company was categorized as an "Internet" company or a "book retailer." The authors, using 429 research reports on Amazon.com from 15 different analysts, found that analysts who categorized Amazon.com as a "book retailer" were far more pessimistic about the company than those analysts who categorized the company as an "Internet" company.[27]

The work of Beunza and Garud provides a *real-world* variation on the idea of mental accounts, cited at the start of this section on framing. We like to put information and investments into "buckets." Indeed, we like to put analysts into "buckets," having researchers involved in examinations of specific industries or sectors of the market. However, when the "buckets" serve to frame investor decision making, they become problematic and undermine the veracity of quality research. There are ways around this that I'll discuss in later chapters.

As one can glean from my discussion above, framing biases are varied and difficult to avoid. While much of what I've discussed pertains to more generalized decision making, it is not too large of a leap to conclude that much of the evidence cited to support framing is tangentially related to an assessment of investment prospects as well.

## Dropping an Anchor in a Sea of Information

In twenty-first-century life, we are beset by a sea of information. Analysts have at their disposal, with a click of their mouse, regulatory financial statement filings, news articles on a given company, industry research, other analysts' research on the same stock, comments from market pundits, and literally millions of numerical figures corresponding to stock prices, financial statement information, and other data.

Yet, in the course of one's research, is it smooth sailing? Are we able to take all of the data that is presented to us and sail along the sea of information to an accurate estimate of intrinsic value without stopping? Or do we drop anchor at some point? Does a number presented to us in this sea of information affect our decision making, anchoring us to a figure that may be biased or inaccurate? Anchoring, in this respect, is a very real behavioral problem. It's been identified in both lab-based academic settings and in more information-rich, *real-world* settings. We probably find that we are anchored to certain prices for an array of consumer goods, more frequently than we feel comfortable admitting, but it's also likely that this cognitive error presents itself in a variety of ways in the world of investment decision making.

Daniel Kahneman and Amos Tversky first identified and explained this behavioral phenomenon in a paper examining the effect that irrelevant information has on individual decision making. In their 1974 paper,[28] Kahneman and Tversky describe an empirical test they conducted whereby subjects were asked to estimate the number of African countries that belonged to the United Nations. However, prior to asking for an estimate, the researchers spun a wheel

with the numbers 1 through 100 printed on it. The subjects were then asked to determine whether the percentage was higher or lower than this number. Then, they were asked to estimate the percentage. Test participants who received the number 10 from the spin of the wheel, had median estimates of 25, while those who received the number 65 from a spin of the wheel, had median estimates of 45. Kahneman and Tversky explain that when we put a number in someone's head, prior to asking them a question (unrelated or not), they tend to consider the number in their answer. This seems a bit crazy, but in test after test after test, this phenomenon is observed. And from an economic perspective, this behavioral bias can have far-reaching affects.

While Kahneman and Tversky present an interesting example of biased decision making, it seemed to be lacking in *real-world* "flavor." In response to critiques of this nature, Gregory Northcraft and Margaret Neale, both formerly of the University of Arizona, examined the anchoring tendency in a more information-rich, real-world setting: the residential real estate market in Tucson, Arizona. Forty-eight amateur subjects (undergraduate business students) and 21 expert subjects (real estate agents who had been selling real estate for, on average, 6.99 years) were shown a residential property in Tucson, Arizona (which they toured) and were provided with a 10-page packet of information. This information included[29]:

- A set of instructions concerning the exercise.
- The standard multiple listing service (MLS) listing sheet for the property.
- A copy of the MLS summary of residential real estate sales for both the entire city and the immediate neighborhood of the property for the past six months.
- Information (including listing price, square footage, characteristics of the property, etc.) about other property located in the same neighborhood as the property being evaluated (this information was divided into four categories: property currently for sale, property recently sold, property sold but the sale not yet completed, and property previously listed that did not sell).
- Standard MLS listing information for other property in the immediate neighborhood currently for sale.
- A questionnaire to be completed after touring the property being evaluated.

The subjects were then asked to provide:

- Their estimate for an appraised value of the property.
- Their suggested advertised selling price.
- What they felt was an appropriate price to pay for the property.
- The lowest offer they would accept for the house if they were the seller.

All subjects were given the exact same 10-page packet of information, except for one variable: the listing price. Four different listing prices were provided to four different groups of test subjects. The real listing price for the property was $74,900, however, a "low-price" listing price of $65,900 was given to one group, a "moderately low price" of $71,900 was given to another group, a "moderately high price" of $77,900 was given to the third group, and the final group was given a "high price" of $83,900.[30] The authors noted that "these prices were used because local real estate agents claimed that any deviation of listing price from appraisal value of more than 5 percent would be seen by most real estate agents as obviously deviant. The two "moderate anchors were 4% from the appraisal value; the two extreme anchors were 12% from the appraisal value."[31] Given the size of the "expert" group of subjects, only the extreme prices were given to this group.

As is the case in the analysis of common stocks, the calculation of an "appraised value" for residential real estate is thought to be systematic and objective. It generally includes components such as square footage, average prices for comparable properties on a square-foot basis, distinguishing features, and adjustments for the condition of the property. Note that the listing price desired or given by a seller doesn't generally fall into the data set used for this calculation. In this study, the "listing price represents a first attempt by someone (namely the seller) to adjust the appraised value. . . ."[32] However, this first attempt is as germane to the calculation of appraised value as another analyst's estimate of intrinsic value is germane to my calculation of intrinsic value.

This is not to say, however, that estimates of appraised value or estimates of intrinsic value should not differ from analyst to analyst. In truth, there is a fair amount of subjectivity in the calculation of appraised value, just as there is a fair amount of subjectivity introduced into the calculation of intrinsic value for common stocks. Adjustments for condition and distinguishing features can cause even objective assessments of value to differ.

Northcraft and Neale, however, sought to determine whether there was a correlation between appraised value calculated by an amateur or expert and a seemingly exogenous data point such as initial listing price. Even if an expert or amateur found distinguishing features in the property examined, their resulting calculations of intrinsic value should not be grouped, on average, by initial listing prices.

Tables 5.3 and 5.4 provide an abbreviated presentation of the author's findings for the two groups. As the tables reveal, attempts at controlling appraised values and other estimates of value via an initial listing price clearly work! Once again, I emphasize that all other information, other than the

**TABLE 5.3** Results for Experiment 1, Hypothesis 1: Mean Estimates of Amateur Subjects (N = 48)

| Listing Price Given | Appraisal Value | Listing Price | Purchase Price | Lowest Offer |
|---|---|---|---|---|
| $65,900 | $63,371 | $69,414 | $63,571 | $62,571 |
| $71,900 | $67,452 | $72,328 | $67,581 | $66,928 |
| $77,900 | $70,423 | $75,776 | $70,069 | $70,107 |
| $83,900 | $72,196 | $78,014 | $69,500 | $69,785 |

*Data Source:* Gregory Northcraft and Margaret Neale, "Experts, Amateurs, and Real Estate: An Anchoring-and-Adjustment Perspective on Property Pricing Decisions," *Organizational Behavior and Human Decision Processes* 39 (1987): 89.

**TABLE 5.4** Results for Experiment 1, Hypothesis 1: Mean Estimates of Expert Subjects (N = 21)

| Listing Price Given | Appraisal Value | Listing Price | Purchase Price | Lowest Offer |
|---|---|---|---|---|
| $65,900 | $67,811 | $69,966 | $66,755 | $65,000 |
| $83,900 | $75,190 | $76,380 | $73,000 | $72,590 |

*Data Source:* Gregory Northcraft and Margaret Neale, "Experts, Amateurs, and Real Estate: An Anchoring-and-Adjustment Perspective on Property Pricing Decisions," *Organizational Behavior and Human Decision Processes* 39 (1987): 89.

listing price provided by the seller, was consistent in the packets given to the test subjects. To the question of whether individuals anchor their estimates in making decisions involving uncertainties, I would say the answer is a resounding yes—even for experts. Northcraft and Neale completed a second experiment using a different house and different groups of amateurs and experts, and found similar results.

Dan Ariely, in his aforementioned book on rationality, offers a slightly different view of anchoring, and provides an example that, while consumption based, is analogous to decision making in an investment research context. Ariely delves into the economic principle of supply and demand and its value in serving as a mechanism for setting prices. How are prices set in the market for goods? While many of us are familiar with the notion of supply and demand, and we also likely find it intuitively appealing, is this the way the prices for goods are established in all markets? I will speak about supply and demand in greater detail later in this book, but it's worth noting that, as Ariely described, many of the goods that we buy have prices that are certainly not set by supply

and demand. Watches, shoes, computers, televisions, massages: while demand for goods and the supply of goods are certainly a part of the equation, the process that most purveyors of differentiated products use to price their goods is likely not as disciplined as a supply-and-demand chart would indicate.

To test this theory, Ariely takes two groups of students and professionals and experiments with their willingness to listen to sounds through headphones on a computer.[33] The sounds in question are high-pitched 3,000-hertz squeals that participants in the study are initially asked to comment on; it is noted that many participants "grimace" when they hear this sound. However, after the participants have heard the sound, one group is asked if they would be willing to listen to the sound again for 10 cents, while another is asked if they would be willing to listen to the sound for 90 cents. This is the anchoring question. Then the participants were asked to state the lowest price they would demand in order to listen to the sound again. How do people price goods? How would you price this good? Interestingly, those who were originally offered 10 cents to listen to the squeal demanded 33 cents on average to listen to the sound again. Those who were offered 90 cents demanded 73 cents on average. Why would these groups be different? From the standpoint of a purely rational, self-serving, economically motivated individual, why would a proposed price influence a demanded price?

I suppose it's arguable as to whether we can expect behavior similar to this in investment research; however, given our innate tendencies as identified in the preceding experiments, I would be surprised if anchoring was not widespread. Still, the body of research examining anchoring by analysts and other professional or amateur investors is sparse. While much research has been conducted on anchoring in a more generalized decision-making context, less research has focused specifically on finance or economics. Still, there are a handful of arguments worth mentioning that relate to anchoring. Some have argued that the popularity of technical analysis is due mainly to the relationship between technical signals and common cognitive errors, including anchoring.[34] Similarly, Robert Shiller has noted that in "making judgments about the level of stock prices, the most likely anchor is the most recently remembered price."[35] Others have argued that historical dividend yields and price-to-earnings (P/E) ratios serve as anchors for the market on an ongoing basis.[36] While these fundamental factors are admittedly relevant, the authors argued that these measures appear to disproportionately influence future estimates of value.

In researching common stocks, one is mired in a plethora of numerical values. To think that anchoring exists is far from outlandish. Indeed, to think

otherwise is likely naïve. Stock research is grounded in a number of quantitative formulas, requiring very subjective inputs, but seeming objective. This is similar to the circumstances found in the real estate experiment cited previously. While the research in this area has been meager, I suspect that anchoring is one of the more prevalent cognitive biases and likely impacts valuation in a number of ways. As is found in the representativeness heuristic, anchoring could have an effect on many components of investment analysis. These avenues could include:

- The consensus estimate's effect on analyst estimates for growth in earnings.
- The current price of the stock in reference to target prices.
- The current relative valuation of a stock (P/E, price-to-book [P/B], dividend yield, etc.) in relation to future price targets.
- Other analysts estimates for earnings or revenues.
- Price changes in competitor, industry, sector, or market securities.

There are many avenues for anchoring to insidiously work its way into our assessment of uncertainties. Consequently, while the direct data and research on anchoring affecting market efficiency is light, there is robust tangential evidence to make the case that individual decision making is likely influenced in this regard. Also, there is a herding tendency that appears to take place among research analysts that may or may not be consistent with anchoring but nonetheless points in that direction. It's worth noting that the distinction between anchoring and herding is relatively subtle. Anchoring is the allowance of outside stimulus—relevant or irrelevant—to affect one's own estimates, while herding is more deliberate. I'll discuss herding in the following chapter in conjunction with correlated mistakes; however, there appears to be a tendency for analysts to pay attention to other analysts and their estimates.[37] If analysts are interested in the work of other analysts, it's likely that they are examining their work and seeing numerical values that may influence their own work. Some of this influence is likely deliberate, in a manner that would be more generally described as "herding" behavior. Other influences are likely less deliberate and are more reflective of anchoring.

## Conclusions

The point of this chapter has been to establish a theoretical and empirical basis for irrational individual decision making. As rational market participants are the starting point in theories of market efficiency, it's logical to conclude that

any errors in pricing would likely emanate from irrational behavior. As a consequence, this chapter has offered a significant amount of information in order to lead investors to two underlying conclusions:

1. Individuals cannot be presumed to be rational in the way in which they approach the valuation of common stocks. They are not rational in the way they approach decision making in general, so to presume they would be rational in their approach to security valuation would likely be erroneous.
2. In trying to identify market opportunities, our starting place is to examine our own behavior and the behavior of others. In identifying behavioral errors, we open the doors to better processes and more accurate reflections of underlying value. This allows us to take advantage of opportunities and avoid valuation errors.

This chapter started by differentiating between reasoning and intuition, noting that while individuals are fairly adept at addressing simple questions of fact, when it comes to assessing uncertainties, individuals often rely on erroneous heuristics and mental shortcuts. Many of these errors emanate from the difficulties individuals have in reasonably assessing the likelihood of the complex interaction of many variables. Bayes's theorem served as an example of our general inability to properly assess complex probabilities, even if grounded in factual data.

However, the non-Bayesian nature of individual decision making in many instances has less to do with our ability to undertake calculations and more to do with our tendency to skip calculations and simply fall back on mental shortcuts. These shortcuts are often described as behavioral errors and take many forms. While this chapter has not detailed an exhaustive enumeration of the many behavioral errors that afflict individual decision making, it has focused on three that I believe are more prevalent in security analysis: representativeness biases, framing biases, and anchoring.

While the functioning of the domestic stock market is too complex and messy to provide definitive evidence of specific behavioral errors, there has been ample empirical research conducted documenting behavioral errors in a number of controlled experiments. Still, there are two important points to consider in determining the likelihood that the pricing of individual securities is affected by behavioral errors: (1) we know that individuals are prone to behavioral errors, as exhaustive research has documented a number of errors; and (2) there is no question that there must be at least some biases present during some of the more volatile periods of time during the past 30 years. As was noted in Chapter 4, while the fortunes of most companies generally change very slowly over time, the market responses in both movements upward and movements downward have

been extreme. One needs look no further than the market crash of 1987, or the period that encompasses the technology-media-telecommunications *bubble* and deflation (between 1997 and 2003), or the recent banking crisis and recession that arguably went from 2007 to 2009.

In short, it's likely that investors are swayed by a number of factors, and they are often unaware that they are being swayed. As I'll discuss in later chapters in this book, the calculation of intrinsic value is based on a company's performance in future years. As a consequence, we make up numbers. The point is not that an analyst's prediction is wrong, for we know that we will generally be wrong. The problem pertains to the degree of error. The point is that we often look at data and come to conclusions that are not necessarily probable. Many would say, "So what? Investing is risky, and people make bad decisions all the time." The problem is that the irrationality that one sees with regard to decision making is not simply confined to a small subset of the populace. Indeed, as I will discuss next, in Chapter 6, the irrationality is often very widespread.

Understanding behavioral biases and what might affect our decision making is paramount in not only identifying opportunities but avoiding disasters. While this chapter has largely focused on academic studies, the conclusions are applicable to common stock research. This is not only the starting place in a theoretical critique of the theories of market efficiency; it's also our starting place in identifying market opportunities.

## Appendix: Utility Theory and Prospect Theory

This chapter has focused on the rationality of individuals and the way in which our decision making is perverted by behavioral errors. One of the starting places with regard to determining individual rationality is the manner in which individuals approach risky propositions. Risk is difficult to quantify, and any professional investor who's been tasked with helping to determine a client's "risk tolerance" knows that assessing an individual's comfort level with risk is, at best, simply difficult.

We find that individuals change their tolerance for risk as perceptions of payoffs change. The mass exodus from domestic equity mutual funds in 2008 and early 2009 are reflective of changes in the perception of the risky gambles that individuals view the market as representing. Consequently, understanding how individuals approach risky prospects is important in understanding how we may change as circumstances change and how clients may change as circumstances change.

To this end, our starting point is our understanding of how we view the utility of gambles. Gambles refer to uncertain payoffs that have probabilities directly attached to them. All investments, in this regard, can be viewed as gambles. However, while we discuss gambles with discrete odds attached to them, in the realm of investments the odds are less clear, may change, and are likely to be perceived as changing.

I'll start this appendix with a basic discussion of expected utility theory and conventional economic views of rationality as they pertain to utility theory. Next, I'll discuss an alternative view of utility theory, as proposed by Daniel Kahneman and Amos Tversky (yes, them again), which calls into question the conventional view of individual rationality. Finally, to close, I'll briefly discuss the relevance of this topic to investing and the notion of market efficiency.

## Utility Theory and Rationality

One of the building blocks in modern economics is expected utility theory. This theory, first proposed in 1738 by Daniel Bernoulli[38] (based on the work of his cousin Nicolas in 1713), proposed that individuals, when faced with gambles, seek to maximize their utility according to a mathematical function. This mathematical function not only accounts for the likelihood of the outcome, and its value, but also adjusts the expected utility to account for the general risk aversion of most individuals.

Consider, for example, a choice between two gambles:

1. 100 percent chance to win $1, or
2. A 50 percent chance to win $2.50.

First, notice that this is a fairly simple bet, based on gambling $1 on a flip of a coin, with an expectation of receiving $2.50 should the player win. If you don't bet, you simply keep your $1 (the 100 percent chance to win $1). If you do bet, you get $2.50 if you win. The expected values of these two gambles are simply $1 (100 percent × $1) and $1.25 (50 percent × $2.50). Prior to expected utility theory, it was thought that people should always prefer the gamble over the certainty when faced with the aforementioned two prospects. The expected return for the gamble, $1.25, is worth more than the certainty of $1. So, expected utility theory advanced the notion that individuals are generally risk averse, and for that reason, their utility is affected by some function that adjusts the expected value to account for risk aversion.

Adding to this argument, John von Neumann and Oskar Morgenstern[39] proposed that any individual who adhered to four axioms of rationality has a

utility function. For more than 50 years, rationality has been largely defined by von Neumann–Morgenstern rationality. These axioms require that, among other things, individuals be logical and consistent in their preferences. Foremost, von Neumann–Morgenstern rationality requires that individuals have a preference in the first place (referred to as *completeness*). One must prefer apples to bananas, bananas to apples, or like both equally. Generally, economists can make this less intuitive by noting that if an individual is choosing between alternatives A and B, an individual either likes A over B, B over A, or, alternatively, the individual likes A and B equally.

In addition, if one likes apples more than she likes bananas, and if she likes bananas more than she likes coconuts, then she must like apples more than she likes coconuts. In other words, she must have consistency in her preferences (referred to as *transitivity*). More generally, if one's alternatives are A, B, and C, then if one prefers A to B, and B to C, he can't prefer C to A. He must prefer A to C, as it's logically consistent with his other preferences.

Von Neumann–Morgenstern rationality furthers this notion of consistency by noting that if one prefers apples to bananas, and is selecting between these two fruits, then if we suddenly offer a coconut as a third choice, this addition will not change the fact that one prefers apples to bananas (referred to as *independence*). Further to this point, if apples are preferred to bananas and bananas are preferred to coconuts, then some combination of an apple and coconut can be constructed to equate its utility to a banana. For example, it could be that one is indifferent to having 90 percent of an apple and 10 percent of a coconut or having 100 percent of a banana. At any rate, there is some combination of an apple and coconut that is equally satisfying to having a banana (referred to as *continuity*).

But, importantly, these axioms are axioms of how people *should* behave, not necessarily how people *do* behave.

## Prospect Theory

Kahneman and Tversky, in their seminal work "Prospect Theory: An Analysis of Decision Under Risk,"[40] found that individuals don't always display von Neumann–Morgenstern consistency in their decision-making preferences. Indeed, it is striking how inconsistent individuals are in their attitudes toward risk.

Kahneman and Tversky found that individuals were generally risk averse[41] when it came to gambles involving gains (consistent with generalized expected utility theory), but were risk seeking when it came to losses (not only inconsistent with expected utility theory, but in violation of von

Neumann–Morgenstern axioms of rationality). In what they termed the *reflection effect*, Kahneman and Tversky examined individuals' preferences involving selections among various prospects with positive and negative payouts. The results of their study are found in Table 5A.1.

This is best understood by looking at each problem as a decision between two different gambles (or "prospects"). The value of the gamble is listed, with the probability that it will pay out next to it. In the case where there is no probability associated with the gamble, the amount is a certainty. The bracketed number underneath each prospect indicates the percentage of the respondents that selected that prospect from among the two identified in the problem. "N" below each problem indicates the number of individuals questioned in the study. So, for example, in Problem 3, there were 95 individuals who chose between two different prospects. The first prospect was an 80 percent chance of winning 4,000 (in the study it was Israeli currency), while the second prospect was just receiving 3,000 outright. In this case, 80 percent of respondents selected the certainty (3,000), while 20 percent selected the gamble. In Problem 3', 95 individuals selected between the prospect of an 80 percent likelihood of losing 4,000, or simply losing 3,000 with certainty. In this case, 92 percent of the respondents selected the gamble, while 8 percent selected the certainty.

Notice that in the case of low probability gambles, such as Problem 8 and Problem 8', the tendency is reversed; in these cases, the respondents overwhelmingly select the gamble when it pertains to gains, while selecting the higher-probability outcome when it pertains to losses. In addition, Kahneman and Tversky also found that individuals' decision making was predicated on a reference point that was not always consistent.

**TABLE 5A.1** Preferences between Positive and Negative Prospects

| | Positive Prospects | | | Negative Prospects | | |
|---|---|---|---|---|---|---|
| Problem 3: N = 95 | (4,000, .80) [20] | < | (3,000) [80]* | Problem 3': N = 95 | (−4,000, .80) [92]* | > | (−3,000) [8] |
| Problem 4: N = 95 | (4,000, .20) [65]* | > | (3,000, .25) [35] | Problem 4': N = 95 | (−4,000, .20) [42] | < | (−3,000, .25) [58] |
| Problem 7: N = 66 | (3,000, .90) [86]* | > | (6,000, .45) [14] | Problem 7': N = 66 | (−3,000, .90) [8] | < | (−6,000, .45) [92]* |
| Problem 8: N = 66 | (3,000, .002) [27] | < | (6,000, .001) [73]* | Problem 8': N = 66 | (−3,000, .002) [70]* | > | (−6,000, .001) [30] |

*Source:* Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica* 47 (1979): 268.

## Conclusions

The work by Daniel Kahneman and Amos Tversky is important in that it shows that individuals do not act in a manner that is consistent and logically rational. At times, individuals are risk seeking; at times, they are risk averse. Sometimes, this aversion, however, depends on the amount of money involved and the odds of success. The relevance of these preferences and preference reversals to market efficiency is clear. Market participants cannot be considered rational, if attitudes regarding risk are inconsistent and change with the circumstances.

In approaching investments, individuals always approach investments with an attitude that gains will be made on their investments. This may not be the case or reality, but it is the perception. However, unless they are looking at long shots (and they are looking at long shots in some situations, such as small-cap growth companies), they are looking for companies that seem relatively safe—these companies have perceived consistency in their results, and they are perceived as having less uncertainty. It is this tendency that makes growth-oriented investments far more palatable than more value-oriented, or contrarian, processes. It is far easier to sell an investment strategy that is concerned with purchasing companies that have been growing consistently than it is to sell a strategy that seeks out situations with more uncertain growth prospects—regardless of the underlying valuation.

Most individuals approach less certain investment prospects with a visceral revulsion. However, given the uncertain nature of all common stock investments, much of this revulsion is based on perceptions of uncertainty, rather than objective accounts. Consequently, those companies that have a track record of outsized growth or consistent growth are viewed as more palatable than those companies that have less consistent growth. Valuation, I would note, is unfortunately a secondary factor in decision making and carries less weight.

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*The Large-Cap Portfolio: Value Investing and the Hidden Opportunity in Big Company Stocks*
by Thomas Villalta


CHAPTER 6

# Correlated Mistakes and the Failure of Arbitrage

In Chapter 5, we examined how individual decision making is oftentimes irrational and prone to various behavioral errors. This is in clear violation of the first theory underpinning the broader notion of market efficiency but certainly does not close the case on market efficiency. Recall from Chapter 3 that the notion that markets are efficient does not live and die strictly at the hands of the *individuals* that comprise the market. In short, market efficiency is predicated on three theories:

- Individuals are rational beings that make self-interested choices.
- In cases where individuals behave irrationally, their *errors* are canceled out by others who take an opposing viewpoint. In other words, irrational market participants' actions are not correlated with other irrational market participants' actions.
- In cases where correlated mistakes among irrational market participants occur, arbitrageurs stand ready to rectify erroneous pricing. This group of coldly rational market participants stands ready to act quickly and decisively.

In this chapter, I'll discuss theories 2 and 3, examining how individual mistakes tend to be correlated due to a propensity to herd, and then examining why arbitrage tends to sound good in theory but is difficult to implement in practice. While large-cap opportunities tend to present themselves due to

irrational decision making on the part of individuals, as discussed in Chapter 5, it's important to understand why the market doesn't coldly rectify poor decision making on the part of any individual. Understanding the draw of groups, and the ways in which we are influenced by others, offers lessons in how to objectively examine one's own decision making. Moreover, understanding the agency problems associated with arbitrage has broader ramifications for those that are managing an enterprise that is focused on managing the investments of others.

This chapter is comprised of two broad themes: correlated mistakes among market participants and the failure of arbitrage to bring prices into alignment. While my discussion of arbitrage is contained in one section of this chapter, in discussing correlated mistakes, I'll delve into a number of subtopics:

- Herding and why we're predisposed to correlated mistakes.
- Evidence of herding in securities markets and in the analysis of common stocks.
- Feedback mechanisms and mood contagions.

Finally, after a discussion of why arbitrage fails to bring prices into alignment, I'll end the chapter by discussing some of the lessons that we can learn from the failures of the latter two theories underpinning market efficiency and why understanding these failures can make us better portfolio managers.

## Herding and Why We're Predisposed to Correlated Mistakes

Like individual decision making, an explanation of correlated mistakes is not an easy subject to undertake. Mistakes do not become correlated for simple reasons. Moreover, like individual decision making, the grouping of mistakes is largely due to tendencies that are innate to the individual. These inclinations have sociological roots, but there are also psychological underpinnings that drive decision making and amplify these instinctive tendencies.

Mistakes become correlated when a large number of individuals behave in the same way. Their mistakes end up being the same or similar, as the individuals act like others or allow others to influence them. When groups of individuals act in a similar fashion without planned direction, they are said to *herd*. While there are those that simply blindly imitate the investment actions of others (sometimes called an *informational cascade*), I don't believe that this

type of behavioral convergence is prevalent among sophisticated investors. The more prevalent and insidious form of behavioral convergence is herding, as it is more often the case that we are simply allowing the actions of others to influence our actions.

Still, as previously noted, correlated mistakes do not simply occur because of social interactions (or social learning) and the influence of others. They can come about because we are prone to make the same behavioral errors as others and thus make similar decisions. The way in which we make decisions was discussed in Chapter 5, and I'll touch on its relevance here only briefly. Social learning has been a significant component to individual development from one's infancy and is grounded in sociological factors to human development. As we grow into adults, our tendency to learn from others is at times beneficial and at times detrimental.

As was discussed in Chapter 5, our decision making often relies on behavioral shortcuts. Many of the behavioral biases discussed in Chapter 5 do not show idiosyncratic divergences among test participants, but largely uniformity. The work of Kahneman, Tversky, Thaler, and others provides support for the assertion that individuals do not behave rationally in their decision-making processes. But what makes their research convincing is the uniformity in the responses they receive from a large number individuals. As a consequence, the uniform nature of respondents' mistakes in decision making provides us with evidence that individuals are irrational in their decision making, but it also provides us with the most convincing evidence that individuals act in a correlated manner. In other words, a great number of people make the same or similar mistakes, using mental shortcuts in deciding between various uncertainties.

However, while our own behavioral errors are similar to the behavioral errors of others, we are also prone to follow the lead of others, exacerbating a convergence in behavior that comes from our simply being "human." Most prominently, we all have an instinctive tendency to learn from social interactions and, as a consequence, imitate those around us. When others are fleeing a building, it's usually a good idea to follow suit—we don't necessarily need to see the smoke to ascertain that something's wrong. This is a reflection of the animals that we are and is likely a remnant of our early evolutionary environment. My 10-month-old son, Benjamin, learns by watching and imitating others, much as I learned by watching and imitating others. We are raised from a very young age to follow the instincts of the herd and do as others do.

Still, it's important to note that, for survival, the actions that we learn by way of imitation and following the herd are based on simple needs of our existence. I can't eat if I don't put something in my mouth. To communicate, I need

to open my mouth and make sounds. To walk, I need to raise myself to my feet. Social information, or information we acquire from social settings, accounts for the preponderance of our learning in the early years of our life. This extends into our later years, as we learn that our observation of other individuals or groups of individuals can be a great resource.[1] As Robert Shiller notes, "in everyday living we have learned that when a large group of people is unanimous in its judgment on a question of simple fact, the members of that group are almost certainly right."[2] As a consequence, if one asks a group of 50 people what the capital of Minnesota is, the group's response, if unanimous, can generally be relied upon to be correct. Indeed, even if a majority of individuals are congruent in their answer, one can feel confident that they are probably right. However, as I'll note time and time again, most important decisions that investment analysts make are not judgments on questions of "simple fact"; they're judgments on complex assessments of uncertainties. It is in these assessments that we mistakenly view the herd has having a superior answer.

Herding, from a sociological or economic perspective, is thought to include some form of social interaction. This interaction may be explicit, as when we allow the endorsements of others to influence our decision making. Alternatively, it can be implicit, as when the contagiousness of a particular environment influences our mood.[3] While I'll discuss endorsements next, later in this chapter when I discuss feedback mechanisms, I'll talk more about environments that may influence our mood.

We most certainly like the endorsements that others provide. It's news when a large, if not highly regarded, brokerage firm makes a market call or recommends a stock. When Warren Buffett's Berkshire Hathaway releases information on what it's buying and selling, it's sure to wind up on the news and in a variety of reports. And the particular stock will move on the information. Jim Cramer, the popular host of CNBC's *Mad Money,* appears to have an effect on stock prices.[4] In the 1990s, Elaine Garzarelli's thoughts on the market could move the market, as could pronouncements from Abby Joseph Cohen.

Indeed, there are now web sites that specifically guide us to the stock selections of others—an explicit endorsement of others' views. SeekingAlpha.com, which claims that its viewership contains the "highest percentage of financial professionals of any major finance web site," with the most educated audience and the most active investors,[5] has offered the following stories to readers in a two-day period:

- "7 Short Ideas from Billionaire Steve Cohen"[6]
- "David Einhorn and Insiders Are Bullish about These Stocks"[7]
- "Billionaire T. Boone Pickens' Stock Picks with the Most Upside Potential"[8]

In addition, The Motley Fool (www.fool.com), one of the more trafficked investor web sites, offers the following article with a similar theme: "Goldman Sachs Thinks These Are the 10 Highest-Quality Stocks in the World."[9] One of my favorite articles that exemplifies this phenomenon was found on the *Wall Street Journal*'s web site, wsj.com: "Leon Cooperman Dares to Diss Apple."[10] How dare he? Here we have a famed investor, Leon Cooperman, the chief executive officer of one of the largest hedge funds in the world, Omega Advisors, who is not following the herd, and being called out for it. He's cited because journalists realize that readers (or investors) appreciate endorsements from noted investors. However, the headline draws one's attention, as it points to the scarcity of portfolio managers and analysts with views that diverge from a generally bullish assessment of Apple's prospects.[11]

This is not to say that there is anything wrong with reporting on and examining what others are doing. However, given that we are predisposed to imitate others and have a propensity to herd, these types of articles would appear to feed our innate desires. Being aware that one is prone to behavioral errors and being aware that we are prone to imitate, or at least fall sway to the opinions of others who themselves are prone to behavioral errors, should cause one to take caution in the manner in which they are forming opinions.

## Evidence of Herding in Securities Markets and in the Analysis of Common Stocks

It's reasonable to ask if we see evidence of herding in the stock market. Direct evidence of herding within the stock market for individual securities is difficult, if not impossible, to undertake. Each common stock in the broad domestic stock market has a number of free-floating shares. Unlike open-ended mutual funds, the share counts for common stocks don't change with each trade. Thus, in looking at aggregate behavior, we will always see the same number of buys as sells for a particular issue. Unless the company issues new shares, we don't see the effect of new money flowing into a particular common stock, as shares are simply trading hands. This is not evidence that herding doesn't exist, but rather evidence that a broad examination of common stocks does not supply an appropriate avenue to find herding behavior.

Breaking the broader investing market into subsets could provide some evidence of herding, as we could then examine the flow of funds from one

investing market to another. To this end, an examination of mutual fund inflows and outflows may prove instructive, as open-ended mutual funds allow us to see new money coming into a subset of the market and existing money leaving a subset of the market.

If money is reacting in a coordinated fashion to nonfundamental information (such as inordinately robust share price declines and advances), then one could possibly draw some anecdotal conclusions regarding herding in the stock market. Table 6.1 provides the Standard & Poor's (S&P) 500's total return for

**TABLE 6.1** 25 Years of Mutual Fund Net Fund Flows

| Year | S&P 500 Return | Total Equity Fund Flows | Total Bond Fund Flows |
|---|---|---|---|
| 1987 | 5.21 | $19,231 | 6,797 |
| 1988 | 16.81 | –14,948 | –4,488 |
| 1989 | 31.49 | 6,774 | –1,226 |
| 1990 | –3.16 | 12,915 | 6,813 |
| 1991 | 30.55 | 39,888 | 59,236 |
| 1992 | 7.74 | 78,983 | 70,881 |
| 1993 | 10.00 | 127,260 | 70,559 |
| 1994 | 1.29 | 114,525 | –62,470 |
| 1995 | 37.47 | 124,392 | –6,082 |
| 1996 | 23.08 | 216,937 | 2,760 |
| 1997 | 33.25 | 227,106 | 28,424 |
| 1998 | 28.77 | 156,875 | 74,610 |
| 1999 | 20.99 | 187,565 | –4,081 |
| 2000 | –9.13 | 309,367 | –49,765 |
| 2001 | –11.80 | 31,966 | 87,704 |
| 2002 | –22.10 | –27,550 | 140,612 |
| 2003 | 28.69 | 152,316 | 31,629 |
| 2004 | 10.88 | 177,863 | –10,782 |
| 2005 | 4.89 | 135,651 | 31,232 |
| 2006 | 15.81 | 159,454 | 60,569 |
| 2007 | 5.50 | 74,712 | 108,318 |
| 2008 | –36.90 | −227,821 | 29,543 |
| 2009 | 26.46 | 202 | 380,417 |
| 2010 | 15.06 | −36,688 | 241,381 |
| 2011 | 2.11 | −130,322 | 124,763 |

*Data Source:* Standard & Poor's and Investment Company Institute (ICI).

a given year, as well as the Investment Company Institute's mutual fund net flow data for total equity mutual funds and total bond funds. We can see that following the market *crash* in late 1987, the calendar year that followed showed significant outflows from the domestic equity market. Upon entering the third year of the bear market that followed the technology, telecommunications and media *bubble* of the late 1990s, we saw the first significant outflow of money from total equity funds since the 1988 outflows. Finally, since the most significant one-year downward movement in the S&P 500 in more than 25 years (the *crash* of the market in late 2008) we find that investors continue to pull money from the market *en masse*. Alternatively, the bubble of the late 1990s found a significant upward movement in net fund flows to total equity funds, with 2000's $309 billion inflow providing a dramatic crescendo. Admittedly, this data is a bit messy. Some outflows occur in the years of downward movements, and other outflows occur after a couple of years of downward movements. Also, I wouldn't consider this scientific, but simply anecdotal evidence. Still, if we conclude that market *bubbles* and market *crashes* exist, as discussed in Chapter 4, then we concede that there are (according to the Fama-Friedman arguments discussed in Chapter 3) correlated mistakes being made by market participants. Similarly, if individual or institutional allocations to bonds and equities are not related to market movements—implying an efficient market and stable risk tolerances—then we would not expect that the market's downward movement would result in *en masse* exiting from equity funds.

Still, the more important element to herding and the more appropriate assessment with respect to theories of market efficiency concerns one's view of future uncertainties. While the desirability of an individual stock will not be reflected in the amount of shares purchased (as noted, there will always be a seller on the other side of the trade), it will be reflected in the expectations for the stocks underlying uncertainties, such as future earnings. There has been some research related to an examination of data on analysts' forecasts, with a focus on forward earnings estimates; this makes sense as major data collection services aggregate data for consensus estimate calculations and focus on earnings and revenues. One of the more recent studies, by Murugappa Krishnan, Steve Lim, and Ping Zhou, used a data set comprised of analysts' one-year-ahead earnings estimates and actual earnings data from Thomson Reuters I/B/E/S (covering the period 1990 to 2004). The authors sought to create a model of analyst behavior indicating a propensity to herd or not herd in earnings estimation. Their results indicate "pervasive herding behavior," with their model indicating that a vast majority of the analysts in their sample tended to herd in the period examined.[12] Other research along similar lines has found that analysts' were influenced by recent analyst revisions and consensus recommendations rather than fundamental factors.[13]

Some research into herding has focused on reasons for herding. Why would professional investors herd? In short, to keep clients and stay employed. Under this theory, professional investors herd because they don't want to look too bold, or they don't want their performance to veer too far from the benchmark. For example, Harrison Hong, Jeffry Kubik, and Amit Solomon examined the link between career concerns and analyst forecasting in 2000. In an analysis of 8,421 analysts covering 4,527 firms, the authors explain that "reputation-based herding models suggest that analysts may have an incentive to herd with the consensus."[14] The authors found that younger analyst forecasts were more likely to group around the consensus estimate than older analysts' forecasts, a result that would be consistent with career concerns and the reputational benefits of being more experienced. Along similar lines, research from David Scharfstein and Jeremy Stein examined the rationality (from the manager's perspective) of suboptimal investments that followed the "herd" in a 1990 paper, "Herd Behavior and Investment." The authors note that "an unprofitable decision is not as bad for reputation when others make the same mistake."[15] To this end, our tendency to herd may reflect a subconscious insecurity with our own assessments of growth or our insecurities regarding our ability to calculate intrinsic value. It is difficult to stake a claim that is dramatically different from the consensus. Today, with literally tens of thousands of financial professionals having lost their jobs over the past five years, it would be surprising if employment and reputational concerns did not cloud one's ability to veer from consensus estimates. Technology-purchasing managers formerly adhered to the adage that "no one gets fired for buying IBM." These days, I would argue that no one gets fired in money management and research for being too close to the consensus estimate for IBM's earnings or price target. More to the point, as some have remarked, mutual fund managers don't "lose a job for average performance or for holding the same securities as the rest of the group."[16]

## Feedback Mechanisms and Mood Contagions

As was noted earlier in this chapter, moods in the market can be contagious. While we may or may not be learning directly from our fellow man, it's likely that our fellow man's mood is affecting us. Indeed, moods can be transmittable, with our behavior being affected by others and then our behavior affecting still more. In this fashion, we encounter and contribute to an "emotional contagion."[17] This is a very complex and messy process that likely involves a number of overlapping sociological triggers. Still, this is hardly far-fetched

or difficult to imagine. As Yale economist Robert Shiller notes, investing in common stocks "is a social activity. Investors spend a substantial part of their leisure time discussing investments, reading about investments or gossiping about others' successes or failures in investing."[18]

When we combine the behavioral errors discussed in Chapter 5 with our propensity to imitate or learn from others, we end up with a combination that has far-reaching ramifications for the broader market (in the form of correlated mistakes) and more specific ramifications for our own well-being. However, fueling these errors in judgment are reinforcing mechanisms that work consciously and subconsciously (by way of emotional contagions) to reinforce the decisions that we've made. In this way, feedback mechanisms serve as an important element to correlated mistakes within various markets. Not only do we take signals from our investing compatriots and those that we hold in high esteem, but our conclusions are often reinforced by a barrage of information that has become a hallmark of the twenty-first century. While one might be singularly focused on the fundamentals of a particular investment in the middle twentieth century and earlier, today it's equally important to keep one's emotions and perspective in check. This is no easy feat given the abundance of information at our disposal.

In short, it would be dangerous for any practitioner, professional or amateur, to feel they are immune to amplification mechanisms. Amplification mechanisms can take many forms. For an excellent description, look to Robert Shiller's iconic *Irrational Exuberance.*[19] While Shiller breaks out a separate chapter to describe the cultural affects of media coverage, I would be very surprised if the media is not an unwitting amplification mechanism.

Never before have we been so beset by news and analysis. Moreover, television feeds off of the news cycle to, in essence, give the viewers the information and opinions they want. This is not to say that this is nefarious or even bad. Indeed, part of a capitalist society is the ability to creatively take advantage of trends and cultural phenomenon. Still, it is at times painfully obvious, if one takes a step back and looks at the world from the perspective of an observer rather than a consumer.

During the great buildup of the housing market bubble, saw the invention of an entirely new network—HGTV, which was launched by the E. W. Scripps Company in 1994. While this is certainly not to say that HGTV is responsible for the housing bubble, it was, in my view, a contributing feedback mechanism that reinforced news stories and analysis that painted the picture of a market that offered significant opportunity and couldn't fall. At the very least, it contributed to a contagious mood that reinforced the investment merits of housing. Even while there was an entire network essentially

**TABLE 6.2** Television Shows on Buying and Selling Houses

| Television Program | Channel | Start Date |
|---|---|---|
| *House Hunters* | HGTV | 1999 |
| *Buy Me* | HGTV | 2003 |
| *Designed to Sell* | HGTV | 2004 |
| *What You Get for the Money* | HGTV | 2004 |
| *Flip This House* | A&E | 2003 |
| *The Property Ladder* | TLC | 2004 |
| *Flip That House* | TLC | 2005 |
| *The Real Estate Pros* | TLC | 2007 |
| *Bought and Sold* | HGTV | 2007 |
| *Flipping Out* | Bravo | 2007 |

*Data Source:* Internet Movie Database, imdb.com.

devoted to housing, as the bubble came to a head, a number of television channels were airing programming on buying houses and buying and selling houses quickly. A list of these shows, provided in Table 6.2, is long, with a parade of programming reaching a high point at nearly the same point as housing prices.

One could argue that I have the causal relationship reversed, that the rise in real estate values caused the proliferation in shows. Given the myriad number of elements that drove investments in housing and real estate in general, it would be fruitless to try and figure out what ultimately was the key variable. In general, television programming didn't drive individuals to purchase real estate in the later part of the housing boom. But television programming probably reinforced countless other variables that played into the decision-making process, helping to contribute to a decidedly euphoric mood. And, ultimately, the causal relationship went both ways—programming reinforced notions of value, and values drove interest in programming.

In 2012, we still have HGTV, but it's interesting that as the gold market continues to move higher, we've now found shows that are centered on mining for gold. (I know, who would have thought this would be interesting—and in a different time, wouldn't we think these people are insane?) *Gold Rush: Alaska* on Discovery Communications' Discovery Channel is described by Discovery Communications as "the #1 new series on all of television on Friday nights."[20] On Discovery's web site we find a description of episode one, titled "No Guts, No Glory," providing us with a taste of what to expect from the show:

> Six recession-hit patriots from Oregon stake everything on mining and head north to Alaska to dig for gold and save themselves from financial ruin.[21]

Once again, there's nothing wrong with this. These types of feedback mechanisms wouldn't likely, in and of themselves, push individuals to make decisions. However, given this programming and the countless number of gold-related commercials that one finds on CNBC and Fox News, it's not unreasonable to presume that our moods may be subject to subconscious altering. Gold as an investment is further impacted by the speculative nature of the commodity and the dearth of fundamentals from which to derive estimates of appropriate value. Certainly, I'm not an expert on gold, but at least in the real estate market one had rental rates, replacement costs, and comparable values as a basis for determining value. In commodities like gold, variables that aid us in discerning value are lacking.

For us, as practitioners, to believe that this bombardment doesn't affect us is ludicrous. Certainly, it affects us. While we often view investment analysis as scientific, or mechanical, it is from the beginning infused with our own insights and prejudices. This can be higher-than-average growth rates for near-term periods. This can be longer periods of abnormal growth. This can be turning a blind eye to competitive threats or barriers to entry that are low.

In short, while we may think that we are independent thinkers, and not subject to the persuasive crowd around us, this likely isn't the case. So, in the end, not only are we irrational animals that fail to take a clear and objective view of events, but we are also very much inclined to act like our fellow investors—in essence, following them like proverbial lemmings.

## Smart Arbitrageurs Will Save Us! Won't They?

Probably not.

To start, it's important to distinguish between arbitrage as an investment strategy and arbitrage as a mechanism for correcting market mispricing. This is not a condemnation of arbitrage as an investment strategy. There are many arbitrage strategies that are very successful at adding value. From the perspective of market efficiency, it is a question of arbitrage investors' ability to move market prices in a fairly quick fashion. The arbitrage that I'm explaining in this section is concerned with situations where behavioral errors, such as representativeness biases, have skewed a reasonable assessment of value—up or down. These errors generally have a significant amount of momentum

underpinning them, and are difficult to hedge, as no good instruments allow for the arbitrage trade to be "risk free."

Why doesn't arbitrage work? The forces that create opportunities in the market—individual irrationality and herd behavior—do not set clearly defined time and value limits. In short, a stock that is undervalued today, due to individual irrationality, can, due to the same individual irrationality, become more undervalued tomorrow. Given that many professional investors possess short time horizons and a finite risk-bearing capacity,[22] this tendency becomes problematic for professional investors, regardless of their sophistication and intent. In addition, as most managers are dually concerned with exploiting opportunities and maintaining their business, there are agency frictions that result from the issue described above.

To get a sense of the need for long time horizons and considerable risk-bearing capacity we can consider a simple example relating to one risk-free stock. Consider a timeline with two pricing periods, A and C, as presented in Figure 6.1.

**FIGURE 6.1** Stock Investment (XYZ) with Two Pricing Periods


If an individual purchases stock XYZ at time A, and knows with certainty what that stock's price will be at time C, then the risk in this contrived scenario is rather simple: it would be risk-free. Indeed, if XYZ sells for $50 per share, but we know with certainty that it will be worth $100 per share at time C, then with $50 one can purchase one share of XYZ at time A and sell that share at time C, realizing a return of 100 percent (excluding taxes and transaction costs):

$$\text{Period Return for XYZ} = \frac{\$100\ \text{(Ending Value)} - \$50\ \text{(Beginning Value)}}{\$50\ \text{(Beginning Value)}}$$

$$\text{Period Return for XYZ} = 100\%$$

If one can borrow on margin, with a 50 percent margin requirement, one can purchase $100 in value for $50. The same individual can purchase two shares of XYZ stock for $50, as their investment capacity is $100 with a $50 investment. In this case, if we define beginning value as value net of margin borrowing, and ending value as value net of margin borrowing, we can see

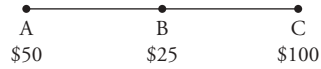
that our return, excluding the cost of margin, leaps to 200 percent, with the same $50 investment.

$$\text{Period Return for XYZ} = \frac{\$150 \text{ (Ending Value)} - \$50 \text{ (Beginning Value)}}{\$50 \text{ (Beginning Value)}}$$

$$\text{Period Return for XYZ} = 200\%$$

This result is obviously very good, when we know what the ending value will be with certainty, and we would think that it would still be a good investment, if we continue to know with certainty what the ending value will be, even if we substitute an interim time period, with pricing at time B, as found in Figure 6.2.

**FIGURE 6.2** Stock Investment (XYZ) with Three Pricing Periods




If, at time B, XYZ's stock price drops by 50 percent, in the first unlevered scenario above, the result would still be the same: 100 percent return. While XYZ's price would go from $50 at time A to $25 at time B, it would move back to $100 at time C. Thus, a $50 investment again results in a $100 ending value.

With our second example, employing leverage, the result is quite a bit different. In this case, the investor is wiped out. In this case, a $50 investment purchases $100 in stock, which falls in value to $50. As the borrowing is $50, more money is required to maintain the 50 percent margin requirement. In the absence of additional funds, the two shares of stock are sold for $50, and the investor realizes a complete loss on his investment, as the $50 is simply used to repay the original margin loan.

The important point here is not that leverage is risky; it's that uncertainty can force one's hand. While in the second scenario, margin requirements forced the sale of stock and the loss, in spite of what appeared to be a guaranteed return, the same result could have happened in the unlevered scenario as well.

Consider the professional money manager, managing funds for clients. The client, when faced with a 50 percent loss of capital, is much more inclined to close her account. In effect, this client has made her own margin call, of sorts. This often will result in the liquidation of the position (resulting in a 50 percent loss).

This makes arbitrage a relatively risky proposition—a proposition that can be met at anytime by either a margin call (in the case of a levered position) or investor withdrawal (in the case of unlevered position). As Harvard economist Andrei Shleifer succinctly notes, with the "finite risk-bearing capacity of arbitrageurs as a group, their aggregate ability to bring prices of broad groups of securities into line is limited. . . ."[23] It is not surprising that large mutual funds look a lot like their underlying benchmarks. It is simpler to explain a small deviation than risk one's livelihood and fund assets on a prolonged contrarian bet that has an uncertain time frame.

To find examples of these dynamics at work, one needs to look no further than the most recent *bear* market for stocks. In October 2008, beset by an inordinate amount of distribution requests, hedge funds and mutual funds were selling down holdings at a furious pace, and worsening the turmoil that had begun that fall. *MarketWatch,* in an interview with Charles Biderman of Trim Tabs Investment Research, noted as much in an article on October 16, 2008:

> Hedge fund investors redeemed at least $43 billion in September as they reacted to the industry's worst year for performance in at least a decade.[24]

The author goes on to note that:

> Several times this month the stock market has slumped sharply during the final hour of trading. That may be because mutual fund managers are getting a summary of redemptions each afternoon and have to sell quickly to return investors' money by the next morning, Biderman explained.

The *Financial Times* also captured this phenomenon in an article in early 2009:

> For hedge funds cheap loans proved doubly disastrous last year. First, leverage amplified losses for many funds and for investors who were themselves geared. Then, the sudden removal of cheap money – as banks called in debts – led to wave after wave of forced selling by funds as they raised cash to repay loans, driving down asset prices and hitting even funds that had little borrowing.[25]

While the feedback effect of forced selling on pricing is an important element to a failing arbitrage trade, the important element that these two articles point out is the difficulty that funds and investors of all types have in maintaining trades. This difficulty is obviously exacerbated by leverage.

In short, however, the issue is uncertainty. Uncertainty presents opportunity, but it also steals it away. Even if we know with certainty that something will come true in the future, the up-and-down movement of the market (the uncertainty of the interim period) can wreck havoc with the best-laid plans. Margin calls, and more importantly, the loss of shareholders or investor confidence, can force the active manager's hand. That active manager may be a hedged arbitrageur or simply a long-only manager that sees value in a particular stock. In both cases, the active manager is doing the work of the arbitrageur, but in both cases the affects of this work are neither complete nor necessarily material.

## Some Related Considerations in Approaching the Active Management of Investments

There are some take-aways that professional and amateur investors can use in managing their own portfolios. While this chapter does not offer specific guidance in looking for opportunistic situations to invest in, it nonetheless provides additional considerations when managing one's own money or the money of others.

- *Be aware of the pull of herd behavior.* We have in innate tendency to follow the herd—and for good reason. Early in our evolutionary development, humans were primarily concerned with survival, and rarely considered uncertain events as part of living. In life-threatening situations, we are almost always best served by following the herd. Likewise, when confronted with questions pertaining to factual information, herd behavior likely results in the most accurate answers.

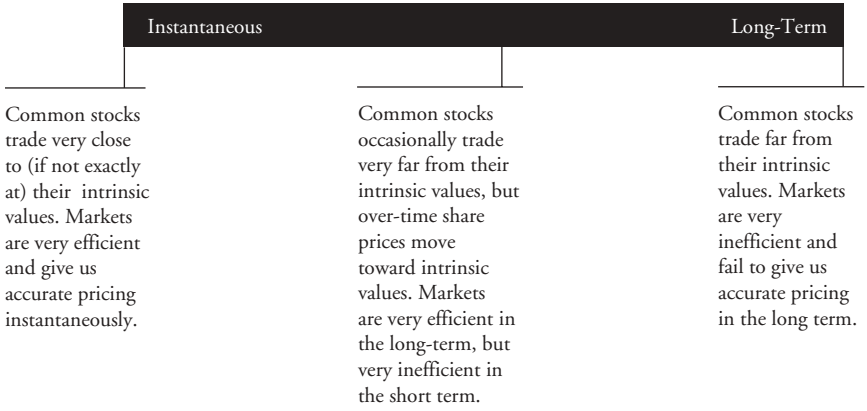
  The uncertainties that the analyst confronts are of a very different sort. Uncertainties that are subject to behavioral biases are more likely to be colored by an inordinate amount of overoptimism or an inordinate amount of overpessimism. In these circumstances, herd behavior can reflect the emotional attributes as much as it can reflect a varied assessment of the various outcomes. As such, being cognizant of the pull of the herd is part of being a good analyst.
- *Be cognizant of feedback mechanisms and their propensity to reinforce irrational, correlated decision making.* The world today offers a multitude of information channels. As analysts, we are constantly reading information from a variety of sources. Still, be aware that hearing market or company forecasts over and over doesn't make these forecasts more probable. In the information-saturated environment that we live in, the repetition of forecasts is less a sign of the validity of the forecast and more a sign of the need for content for various information channels.

- *Be mindful of the symbiotic relationship between portfolio management and client service*. In my experience, there's often a contentious relationship between the client-servicing branch in professional money management firms and the portfolio management and analysis functions. This is truly a self-defeating, misalignment of interests. Part of investment management is not only having the patience to make one's way through the "interim" period discussed previously, but also having a clientele that understands that the behavioral factors that make certain stocks cheap can make them even cheaper. We cannot pick bottoms for stocks. All we can do is find undervalued securities and have the patience to hold them until prices move toward intrinsic values. Having an effective client service function that is able to explain a strategy and keep investors patient is paramount to this process.

This chapter concludes a critique of the three theories that underpin the notion of market efficiency. While there are those who would argue that markets are efficient, others argue that markets are inefficient—both groups are off the mark. In short, they're not really asking the right question. The right question might be: where on the spectrum of market efficiency do you fall? Empirical evidence seems to suggest that the right questions relates to the time frame rather than a definitive question of whether efficiency exists. In this sense, it is likely that the market is both efficient and inefficient, depending on one's perspective of the time it takes for prices to move to accurate reflections of value.

To this end, it may be easier to consider the issue of market efficiency as a spectrum of time horizons, as seen in Figure 6.3.

**FIGURE 6.3** Spectrum of Time from Instantaneous to Long Term



On one end of the spectrum we have instantaneous reflection of accurate intrinsic values. On the other end of the spectrum is long-term inefficiency, where values are truly random and never move toward accurate reflections of value. Given the volatility of markets, it is difficult to accept that markets are instantaneously efficient and give us accurate assessments of true value on a second-by-second basis. However, it's equally difficult to accept that the market doesn't move stocks toward intrinsic values. So it's likely that the efficiency of the market falls somewhere in the middle. My sense is that the time horizons vary, depending on the environment and company-specific factors.

## Conclusions

While Chapter 5 addressed the first of three theories that underpin the notion of market efficiency, this chapter has addressed the final two. From an investing perspective, we learn much about the errors made in the analysis of common stocks by examining the behavioral errors that individuals make in approaching uncertainties. However, while Chapter 5 offered a number of insights, it didn't fully explain why markets behave in a manner that many would consider inefficient. This chapter has hopefully offered two additional arguments and a fuller critique of the Fama-Freidman theories.

In a critique of the theory of market efficiency, we must address the validity of the presumption that mistakes made by market participants are uncorrelated. First, the behavioral errors identified in Chapter 5 offered compelling evidence that individuals often err in their decision making. However, what makes the examples in Chapter 5 compelling is the preponderance of subjects that utilize the same mental shortcuts and arrive at the same irrational and inconsistent decisions. This uniformity in responses also offers some of the more compelling evidence that we not only err in our decision making, but we make the same errors as others. In short, our mistakes are correlated with others. Second, we have an innate tendency to follow the herd. While following the herd may be beneficial in addressing questions of fact, when faced with uncertainties, following the herd may be reinforcing the emotional aspects prevalent in addressing uncertain outcomes. Also, it's worth noting that feedback mechanisms reinforce more explicit herding tendencies (such as imitation and reputational herding). To this end, we find that the ubiquitous nature of twenty-first-century media and popular culture buttress urges that are already innate to us.

Finally, if markets are inefficient, we must address the inability of arbitrageurs to bring prices into closer alignment with intrinsic values. While

Freidman's argument pertaining to arbitrage is intuitively appealing, we find that in the real world a number of impediments conspire to limit the ability of this coldly rational group. In truth, the effects of arbitrage are limited, as the investors that would undertake such strategies don't have unlimited risk-bearing capacity. As the forces that create opportunities can create still greater opportunities, the investor seeking to profit from arbitrage must at times contend with interim periods of subpar performance. While leverage is an obvious obstacle that serves to curtail the risk-bearing capacity of would-be arbitrageurs, client withdrawals can have a similar effect.

While this chapter has primarily served as a critique of the latter two theories underpinning the notion of market efficiency, it still offers a number of take-aways that investors can consider in approaching their research:

- *Be aware of the call of herd behavior.* Understanding the draw of the herd can only improve decision making.
- *Understand the reinforcing nature of feedback mechanisms.* One is accosted by information on a regular basis. Understanding how the same information is presented in many formats can help in determining whether one is being swayed by feedback mechanisms.
- *Understand that client service is an essential element to any investment process.* Getting through the interim period can be the difference between investment success and investment failure.

In the next chapter, I'll move beyond a critique of theories underpinning the notion of market efficiency, and address what I consider the conventional view of where market opportunities are found. While this view is directly at odds with the EMH, it's surprisingly not concerned with the broader theories pertaining to market efficiency.

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*The Large-Cap Portfolio: Value Investing and the Hidden Opportunity in Big Company Stocks*
by Thomas Villalta


CHAPTER 7

# Conventional Views on Sources of Market Inefficiencies

One goal of this book is to help investors choose a research *emphasis* that conforms to the source of market opportunities. We want to make sure that if we are spending time on research and security selection, we are focused on what's important. A starting place in our research is accepting that when we engage in active management, when we research stocks under the guise that market beating portfolios can be constructed as a result of our research, we are first and foremost acknowledging that there are inefficiencies present in the market. If one does not accept that markets are inefficient, then one shouldn't be spending time researching stocks or paying an active management fee. It's as simple as that. To be actively engaged in the management of stock portfolios—whether as a professional or an amateur—is to believe that markets are inefficient.

But one will find that there are different types of inefficiencies, and there are strategies that are formed to take advantage of particular inefficiencies. So it's important to not only differentiate among various types of inefficiencies that exist in the market, but also to understand how one's strategy is attempting to capitalize on the inefficiencies. This, in my view, is of paramount importance. How can you know what you've found if you don't know what you're looking for? Also, is what you're looking for likely to be present?

For discussion purposes, I consider market inefficiencies and opportunities that arise from market inefficiencies from two different perspectives: behavioral view and conventional view.

The behavioral view is not as concerned with access to information as it is with our assessment of uncertain assumptions that are based on the information that's currently available. The conventional view is concerned with access to information and finding information that gives one an informational advantage. In this way, what I term the *structure* of the market plays a particularly important role. Structural elements to a market's efficiency may include the dissemination of information, liquidity, and the depth of professional involvement in securities markets. Some markets and subsets of the domestic market may have structural elements that impede the efficient pricing of some securities.

I discussed behavioral errors and the behavioral view of investor decision making in Chapter 5. In this chapter, I talk about the conventional view of sources of market inefficiency, with a more specific look at structural impediments to efficient pricing. Still, there are no rules that state that behavioral errors and structural impediments can't intermix. For example, structural impediments may exacerbate the effects of behavioral inefficiencies in the pricing of some micro-cap stocks. This chapter will focus on one type of structural impediment to market efficiency, but I would note at the outset that investment analysis in the large-capitalization subset of the market is probably much more affected by behavioral errors. While this chapter is meant to give the reader a broad perspective on how most professional investors approach the sourcing of investment opportunities (the conventional approach), the remainder of this book will spend additional time on behaviorally based inefficiencies and how we shape our research processes to take advantage of poor decision making on the part of others (or combat insidious behavioral errors that seep into our own processes and thinking).

In addition, note that not all money managers, mutual funds, and sell-side analysts adhere to a conventional view of market inefficiencies. There are a number of firms that now take a behavioral approach to stock selection, and there are a number of analysts that integrate a similar idea into their process. Still, the fact that many marketing messages convey a conventional approach to the selection of securities speaks to the appeal of the conventional approach to consumers and likely the analyst community. At the very least, it's worth understanding the connections and differences between the two differing views.

To start, I would note that the conventional view of market inefficiencies fits neatly within the confines of the efficient markets hypothesis (EMH). Recall from Chapter 3 Fama's[1] delineation of three sources of market inefficiencies:

| | |
|---|---|
| **Weak-form efficiency:** | Past price behavior cannot be used to predict future price behavior. |
| **Semistrong-form efficiency:** | Public information cannot be used as the basis to profit in investment markets, as the market assimilates public information immediately. |
| **Strong-form efficiency:** | Nonpublic information cannot be used as the basis to profit in investment markets as the market assimilates all information (public and private) immediately. |

In short, the inefficiencies that Fama is concerned about in the EMH are related to three forms of information. The weak-form efficiency concerns information that is taken from price movements, which directly relates to technical analysis. The semistrong-form efficiency concerns publicly available information, such as information found in regulatory filings and in company presentations, which directly relates to fundamental analysis. The strong-form efficiency concerns all information available including nonpublic information, which relates to insider trading and the inequitable dissemination of company information. The underlying assumptions, of course, are that behavioral errors do not play a part in security mispricing, or if they do, they are not problematic, as the other two theories underpinning the efficiency of markets (not the EMH) discussed in Chapter 6 work to effectively maintain an efficient market.

However, the construct that Fama delineated with the EMH was drawn from our understanding of markets in 1969. It's based on the notion that the primary elements to market inefficiencies are information based, not behaviorally based. Information at one time was likely a factor in the pricing of securities, as the dissemination of information was slow and unreliable, and the regulatory environment was not as concerned with information dissemination. What we've learned over the past 30 years is that it's not only information that's important, but also the way in which security analysts approach the use of information in forecasting future uncertainties. Indeed, the world today is saturated with information, and the dissemination of information is quicker than ever. Moreover, the regulatory environment in the United States has evolved to emphasize information and its equitable and speedy dissemination. The world has changed much since the late 1960s. Still, as discussed in Chapter 4, we continue to find anomalous pricing and a seemingly never-ending parade of market bubbles and market crashes, so market efficiency has hardly been cured by new technology and new regulation.

As was discussed in Chapter 3, beginning in the 1970s, a new movement began to take shape that sought to explain market inefficiencies with newer understandings of individual decision making. This new behaviorally based research questioned the Fama-Friedman arguments underpinning the broader theory of market efficiency, but importantly has never been a very good fit within the EMH. Behaviorally based theories explaining why markets are inefficient relate to the way in which individuals analyze information and form uncertain assumptions; they don't pertain to information access.

It may be that the EMH is correct, even in the strong form. Information of any kind may not give an investor an edge in their analysis of a common stock. But this doesn't mean that the assessments of forward uncertainties, based on current information, are formed rationally. In Chapter 3, when I briefly discussed the EMH, the reader may have been surprised at my brevity. The reason I only touched on this topic was that I don't generally disagree with the EMH. Information that is currently available does not give investors an edge. It's the way in which we approach uncertainties based on information that gives us an edge, not the availability of information.

If we are undertaking research in a large-capitalization stock such as IBM or even a mid-cap stock such as Lexmark International, it's unlikely that we are going to uncover information that is "new" or that will give a practitioner an advantage. Still, that is not to say that our research of these two companies will necessarily concur with research others have done or with the market's assessments of value. In many cases, they will, and our resulting estimates of intrinsic value will not differ greatly from others. In other cases, our research will result in valuations that are significantly different than the market's values or the values that others arrive at, but the difference will not reflect new information but more reasonable or unreasonable assessments of underlying uncertainties. A central point that I'll make time and again is that behavioral factors skew our (or others') impression and estimates of important uncertainties. I come back to the notion that it is the way that we approach uncertainties that's important, not *just* uncovering the uncertainties.

This is not a book on economics; it's a book about investing. While it's fair to argue that behavioral theories don't point to reliably actionable policies, my purposes are not as grand. Indeed, I have a fairly jaded view of economics in general. Too many in politics and finance conflate theory with fact and science with art. Beware of those who rely solely on a single economist's theories or a "school of thought." These charlatans don't understand

that economics is not science and not logic; economics is a tool to help us understand the world around us. To this end, it is very useful to society, but it can also be dangerous when we use it as a crutch. Markets, like life, are complex.

Additionally, this chapter may provide some insights to those that evaluate money managers or mutual funds (or invest in them). While performance is often the barometer on which investors make decisions, I would propose that a more forward-looking manager identification process would first and foremost determine if the manager is fishing in a pond with fish in it. In other words, the consultant should determine if the manager's process reflects the type of opportunities that are present in the manager's universe. Performance is fleeting and is very time-period dependent; it can provide conflicting signals, depending on the time horizon examined and the start date and stop date. In a reflection of the inconsistent signals resulting from measures of performance, savvy institutional investors are increasingly focused on process. Does the process make sense, and is the manager's process one that can identify opportunities, or is it a process that is focused on factors that are not really applicable to the manager's opportunity set or universe? To this end, this chapter may provide some insights into what to look for.

In the next section, I'll discuss structural impediments to market efficiency, with a particular focus on underfollowed stocks. I'll end this chapter with some thoughts on the pertinence of structural impediments to the large-cap universe. In an appendix to this chapter, I'll discuss what I term *underexplained phenomena.* While the anomalies discussed in this chapter's appendix undermine weak-form efficiency in the EMH and are often grouped as anomalies with discussions of behavioral theories, they are less relevant to investors looking to capitalize on behaviorally based market inefficiencies.

## Structural Impediments to Market Efficiency

Professional investors are always looking for ways to persuade potential clients that they can add value and that they can provide a service that is differentiated and unobtainable elsewhere. Interestingly, much of this focus is on company-specific research, and an effort to uncover the latest diamond in the rough. The implication is that hard work, and simply a desire to "dig deep" and get to know a company better, will result in better investment decisions

and a clearer understanding of a company. For example, Janus, the mutual fund behemoth notes:

> At the core of our investment process is meticulous, hands-on research. When our investment team examines potential investments for our Funds, they don't just rely on numbers in a balance sheet. They don't simply talk with a company's management team. Our portfolio managers and analysts dig deeper, looking for new growth catalysts, innovative marketing ideas and new technologies. They strive to recognize tomorrow's leaders by getting as close to a company as possible.[2]

American Funds puts on the rubber gloves and gets to know the company "inside and out":

> In order to determine a security's true worth, our investment professionals get to know a company inside and out. Today, American Funds operates one of the industry's most extensive global research efforts.[3]

Interestingly, Fidelity Investments is concerned with speed. They feel in this electronic age that they get to the "good ideas" faster:

> With Fidelity, you can put our size and agility to work for you. We've got more than 350 analysts, comprising one of the largest research departments in the industry.
>
> We've also set up smaller working groups dedicated to specific regions and sectors, which means the good ideas get to our fund managers faster.[4]

True, these firms are rather easy targets. They're three of the largest mutual fund companies in the world, and it's easy to pick apart marketing materials. However, there is a sense in our business that we can try a little harder, dig a little deeper, and be more thorough in our analysis. The implication is that we just need to look more closely at the companies, that the market efficiency is one of neglect, or undercoverage. This "digging deeper" mentality presumes that the semistrong form of market efficiency described in the EMH doesn't hold in practice. It implicitly assumes that markets are not incorporating all publicly available information into security prices.

The "digging deeper" mentality speaks to a structural impediment to market efficiency, not a behavioral impediment. As noted previously, structural impediments stem from the structure of a market: lack of participants (liquidity), lack of regulation, or lack of professional investors or analysts. The "digging deeper" mentality relates directly to the "lack of professional

investors or analysts," as it's presumed that the stock in question has not been thoroughly analyzed. To determine if there is merit to the "digging deeper" mentality, we will look at "neglected" companies as a proxy for this research emphasis. Neglected companies are companies that have fewer professional sell-side analysts covering them, and have been the source of a number of studies that have delved into this topic. In this manner, we can determine whether the "digging deeper" mentality is a suitable construct for establishing a process to identify market opportunities in large capitalization stocks.

To start, let's set aside the discussion of whether this type of inefficiency would be present in domestic mid- to large-cap stocks, and examine whether there is any validity to the claim in a look at smaller stocks. Why smaller stocks? Because we would expect that there would be less coverage as one moves down the market capitalization spectrum, examining ever-smaller companies ranked in this manner. Market capitalization obviously plays a very large role in determining analyst following: the smaller the stock, the less following by the analyst community. To understand why this is the case, it's important to understand a problem inherent in managing large sums of money—the immateriality of the smallest stocks.

Larger institutions, in general, see less benefit from smaller stocks. If, for example, I manage a mutual fund with $100 billion in assets, how appealing is the stock of a company with a market capitalization of $50 million. Even outright, full ownership of such a company is going to have a minimal impact on my returns. If a $100 billion fund owned all of the common stock in a company with a $50 million market capitalization, then that stock holding would represent 0.05 percent of the fund's total holdings. Even if this stock moves higher by 100 percent in a given period, the return effect is going to be very small.

This is not to say that smaller-capitalization stocks don't have a place in portfolios. However, it is to say that as funds are increasingly successful, or become larger, smaller-capitalization stocks have a less meaningful impact. As a consequence, the marketplace for such investments would be smaller, and the competition for the stock of such companies could conceivably be less. In a related manner, the research community that surrounds smaller-capitalization stocks would be, as expected, smaller, as the size of the investor community interested in such stocks would likely be smaller. And, indeed, this is one of the principal claims put forth by advisors who manage mutual funds in this space: fewer people are looking at these stocks so the stocks themselves are more prone to pricing errors.

Still, it isn't simply a matter of considering the returns of small-capitalization stocks in relation to larger-capitalization stocks. Indeed, simply looking at analyst

coverage may result in the same comparison. There is much that is embodied in return, not the least of which is the risk inherent in owning a smaller enterprise. So, we must back up still further and consider the role that small-cap stocks have in the debate over market efficiency. After a brief discussion of small-cap stocks and market efficiency, I'll return to a consideration of the lack of analyst following as a source of market opportunity.

Small-cap stocks have a storied and well-researched place in a discussion of market efficiency. When Rolf Banz first noted that "small NYSE firms have had significantly larger risk-adjusted returns than large NYSE firms,"[5] he started a quest that continues to have reverberations today. Eugene Fama and Kenneth French famously concluded that neither beta (β), nor earnings-to-price ratios (in effect, an inverted price-to-earnings ratio) add any explanatory power to models that rely on a firm's size and its book equity to market equity (in essence an inverted price-to-book [P/B] ratio)[6]. The view of Fama and French was that a company's size and P/B ratio where all that were needed in order to explain return deviations.

Economists and finance professionals are always attempting to specify risk. We realize that higher-risk investments should have higher returns, but the question remains: why do some firms produce returns that would seem to outpace what we would expect from firms with such a risk profile. So we run regressions and more regressions and look at multivariate models (arbitrage-pricing models) as opposed to univariate models (such as the capital asset pricing model), all in an attempt to discern what is driving stock returns.

But it is hard not to accept that much of what we talk about with regard to a small-firm effect may just be a misspecified estimation of risk. Indeed, in an interesting examination of the size enigma, Jonathan Berk found this to be the case. Berk found that the size enigma (the excess returns that many researchers point to in an examination of small-capitalization common stocks) "results from the measure of firm size—the market value of common equity."[7] When one examines other definitions of size, the resulting difference between the performance of the largest companies and smallest companies becomes much more consistent with views of market efficiency. Table 7.1 is a reproduction of Berk's data on deciles of New York Stock Exchange (NYSE) stocks from 1967 to 1987, sorted by different measures of size: market value, book value of assets, and sales.

As the data in Table 7.1 reveal, the divergence in return found between the smaller deciles of NYSE stocks and larger deciles diminishes significantly if we use book value of assets or sales as the basis for determining size. Indeed, the return for the very smallest group of the 10 deciles is almost halved in both cases. In Berk's view, if there are abnormal returns to be had based on a

**TABLE 7.1** Value of $1 Invested from 1967 to 1987, by Three Different Size Deciles: Market Value of Assets, Book Value of Assets, and Sales

| Size Deciles | Market Value of Assets | Book Value of Assets | Sales |
|---|---|---|---|
| Largest | $ 7.30 | $ 9.95 | $ 10.17 |
| 9 | 8.81 | 12.53 | 13.82 |
| 8 | 9.62 | 11.33 | 12.28 |
| 7 | 9.06 | 9.83 | 10.22 |
| 6 | 11.41 | 13.39 | 17.38 |
| 5 | 14.86 | 14.34 | 12.57 |
| 4 | 11.53 | 14.42 | 12.24 |
| 3 | 18.93 | 15.55 | 14.59 |
| 2 | 21.63 | 16.04 | 18.33 |
| Smallest | 40.51 | 22.99 | 18.44 |

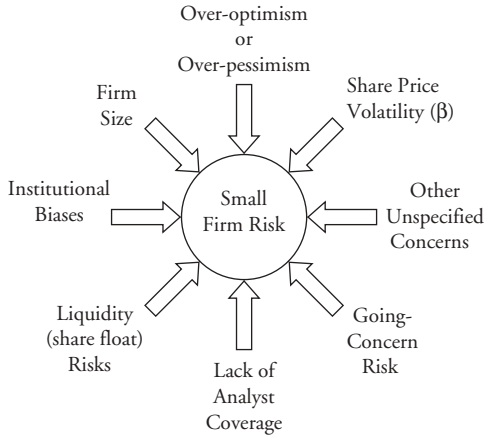
*Data Source:* Jonathan B. Berk, "Does Size Really Matter?" *Financial Analysts Journal* 53(5) (1997): 14.

company's size, then we would see these abnormal returns reflected in rankings using various proxies for size—with market capitalization being one, but sales and book value of assets being others. The implication is that market value is conveying more information that just the firm's size. Market value is, in this context, also conveying information about risk (through the discount rates implicitly used in calculations of market value). Berk concludes by noting that "the idea that somehow this extra return comes as a 'free lunch' is misguided. Firms with low relative market values earn higher returns than others because they are riskier."

Given my prior skepticism regarding the existence of market efficiency, it's difficult for me to accept that this explanation reflects reality. Moreover, note that studies of this kind reflect aggregated stock information and do not reflect individual stock performance. Still, it is likely that there is so much wrapped into small firms' risk that it may just be too complex a relationship for researchers to model with any precision or consistency. The risk inherent in small companies emanates from multiple points, as shown in Figure 7.1.

Small-cap stocks should provide higher returns, as they are smaller in size and are more subject in this way to going-concern risks. Moreover, there are likely aforementioned institutional biases that result in higher required rates of return. There are fewer shares trading in the market, and, as will be noted later in this section, there is a reason to expect more return from stocks

**FIGURE 7.1** Components of Small-Company Stock Risk




with this lack of liquidity. Finally, analyst coverage may play a part. So, we know that small-caps should provide a higher return than large-cap stocks for a variety of reasons. Whether it's an excess, risk-adjusted premium, is likely debatable. However, with these caveats in place, let's return to a consideration of underfollowed stocks, as an exploitable structural impediment to market efficiency, in order to determine if "digging deeper" will result in better investment opportunities.

As noted previously, there is something enticing about "underfollowed" corners of the market. It appeals to our intuition to believe that we are privy to an opportunity that's not been "discovered." Most are familiar with some story or another of someone who got in at the ground floor of an opportunity, or someone who stepped up to invest in a market that had not had significant capital inflows—and in all cases they made an extraordinary amount of money. However, you don't seem to hear stories about people who lost money in such cases, so there is most likely a significant bias to such anecdotal evidence. Still, that's neither here nor there; the point is that, intuitively, we want to believe that underfollowed or new markets present significant opportunities. And they may—although, once again, keep in mind that we expect high returns from high-risk ventures.

Also, there is likely a high correlation between stocks that are risky due to factors that are particular to the "new" or "undiscovered" nature of the market and stocks that are "underfollowed." For example, XYZ Company may not be followed by many analysts because it's extraordinarily risky, and

would not appeal to a wide enough spectrum of investors to merit analysis by a firm. So is the high return that XYZ Company generates the result of inefficient pricing due to a lack of analyst following or is it simply recognition that XYZ Company was close to failing or had a business plan that was more akin to gambling? In spite of my qualifying remarks, let's consider some of the research that has delved into the investment merits of underfollowed or neglected firms.

Arbel, Carvell, and Strebel, in an examination of 510 firms over a 10-year period (through 1979), found that, regardless of market capitalization, underfollowed, or as the authors describe them, "institutionally neglected" securities, provide a "marked neglected firm affect."[8] However, it's worth noting that the authors also found that "total risk does increase with the degree of neglect" but insufficiently so to account for the excess returns.

Using data over a 14-year period through 1995, Beard and Sias also sought to determine if there is a "neglect premium." In their examination of over 7,000 stocks, the authors "found no support for a neglected-firm effect after controlling for the correlation between neglect and capitalization."[9]

A different view, however, can be gleaned from research by Doukas, Kim, and Pantzalis. In research examining data from 1980 through 2001, the authors found that the more analysts that cover a particular stock, the lower the future return.[10] The presumption presented by the authors is that there are significant agency costs that drive analyst recommendations. Thus, the more recommendations there are for a given stock, the more agency costs that appear to be inherent in said stock. Alternatively, one can surmise that the less coverage for a particular common stock, the more there is a propensity for agency costs to be diminished.

This is, however, distinctly different from saying that the fewer analysts that follow a firm, the more likely it is to trade inefficiently. Indeed, Doukas, Kim, and Pantzalis theorize that just the opposite is true—more analyst coverage equals less efficiency. In their view, the more analysts that cover a stock, the higher the stock price and the lower the going-forward return—this is the inefficiency imposed by agency costs. Their view is not that the less analyst coverage results in opportunities, although their view suggests that less analyst coverage results in higher future returns.

So what are we to make of this? I presume that there is something to "neglected securities," although it may be that a supposed premium is misspecified risk or fleeting. Moreover, it may be that, since the 1970s, global research capabilities and coverage has expanded appreciably, rendering this anomaly antiquated. Still, it's worth acknowledging that there are probably research biases, and research does seem to support agency effects as they

pertain to highly covered firms. This does not, however, indicate investable market inefficiency, but rather a pitfall to be aware of.

While I've delved into the neglected firm effect in some detail, I've not touched on some other structural impediments such as lack of regulation or lack of liquidity. My emphasis in this chapter has been related to a "digging deeper" mentality that pervades many investment processes. The return premiums that one can get by investing in illiquid markets and less regulated markets are less germane to the large-cap universe. Moreover, I would argue that one should get a fairly steep return premium when using investment strategies that fish in these ponds.

There are a few take-aways that I think are important to summarize before moving to the next section:

- The notion that if we "dig deeper," we will find more investment opportunities or information on which to act is directly related to the neglected-firm effect.
- It is debatable whether there is a neglected-firm effect. Some studies indicate that one exists, while other studies point to misspecified risk inherent in owning the stock of smaller enterprises.
- It's reasonable to expect higher returns for some "structural" impediments—they aren't really inefficiencies, but reasonable discounts from value that reflect the nature of the market. Liquidity discounts in particular are logical extensions of the risk inherent in owning something one cannot easily sell.

While there may or may not be value in attempting to identify underresearched or underfollowed firms, it's reasonable to ask if this is even pertinent to a universe comprised of mid- to large-cap or just large-cap stocks. In the next section, I'll discuss this as well as offer some concluding thoughts.

## Pertinence to Large-Cap Universe

It's worth noting that if there are opportunities for abnormal profits to be had in underfollowed firms, investors are likely not to find such firms in the Standard & Poor's (S&P) 500 universe or in a universe of the 1,000 largest companies in the United States. Given the number of investment research organizations conducting research on common stocks of all sizes and a regulatory environment that requires broad disclosure of information, it is unlikely that this particular structural impediment affects mid- to large-cap stocks.

**TABLE 7.2** 10 Largest Companies in the United States—Analyst Coverage[11] and Institutional Ownership

| | Analyst Coverage | Institutional Ownership | | Analyst Coverage | Institutional Ownership |
|---|---|---|---|---|---|
| ExxonMobil Corp. | 22 | 49.82 percent | General Electric | 15 | 53.90 percent |
| Apple | 57 | 70.95 percent | IBM | 24 | 59.60 percent |
| Microsoft | 33 | 65.61 percent | Google | 37 | 80.80 percent |
| Chevron Corp. | 24 | 65.10 percent | Wal-Mart Stores | 30 | 32.04 percent |
| Berkshire Hathaway | 3 | 17.79 percent | J.P. Morgan Chase & Co. | 33 | 75.69 percent |

*Source:* Thomson Reuters, www.reuters.com.

If we look at the research coverage and institutional ownership of the 10 largest stocks in the United States, as shown in Table 7.2, we get a sense of sell-side analyst coverage and the extent of institutional research.

The average number of analysts providing earnings estimate information to Reuters for the top 10 stocks in the domestic (U.S.) stock market is 27.8 (30.6 if we exclude Berkshire Hathaway). Moreover, institutions, thought to be sophisticated investors reporting holdings in Securities and Exchange Commission (SEC) 13-F filings, comprised 57.13 percent of the investors in the 10 largest stocks in the domestic market (61.50 percent if we exclude Berkshire Hathaway). For comparison purposes, we can look at the 10 largest issues, on a market capitalization basis, within the Russell 2000 Index (a benchmark of small-capitalization stocks), as shown in Table 7.3.

The average number of analysts providing earnings estimate information to Reuters for the top 10 stocks in the Russell 2000 Index is roughly half of the number cited previously for the largest stocks (at 12.9). The average institutional ownership for the 7 stocks for which information is available is 85.70 percent, a surprisingly large number, in comparison to institutional ownership of the largest companies.

Institutional ownership is revealing, as it quantitatively represents the degree of non-sell-side analyst research being conducted on a firm. It's worth considering that in addition to professional research coverage on the part of brokerage firms and large Wall Street research organizations (that provide estimates to Reuters and other consensus data providers), countless money

**TABLE 7.3** 10 Largest Companies in the Russell 2000 Index—Analyst Coverage[40] and Institutional Ownership

| | Analyst Coverage | Institutional Ownership | | Analyst Coverage | Institutional Ownership |
|---|---|---|---|---|---|
| Interdigital Inc. | 3 | 56.10 percent | Rosetta Resources Inc | 24 | 99.63 percent |
| Complete Prod. Srvcs. | 22 | 97.17 percent | Crocs Inc. | 7 | 91.31 percent |
| Berry Petroleum Co. | 15 | 77.61 percent | World Fuel Services Corp. | 5 | NA |
| Sotheby's | 6 | NA | MFA Financial Inc. | 14 | 84.91 percent |
| Healthspring Inc. | 16 | 93.17 percent | CBL & Assoc. Prop. | 17 | NA |

*Source:* Thomson Reuters, www.reuters.com.

managers, mutual fund research groups, and hedge funds also examine and research companies of all sizes. While sell-side analysts that report estimates to consensus data providers are important intermediaries that impact the broader investment community's assessment of a given company's merits, these sell-side analysts are not the only analysts investigating and analyzing common stocks. Money managers, mutual fund managers, hedge fund managers and the like, have much more "skin in the game" in terms of analysis, as their work results in actionable recommendations. The notion that stones are being left unturned is likely antiquated at this point in history. Even small-cap stocks are looked at by dozens—if not hundreds—of analysts, looking through SEC 10-Qs and 10-Ks in an effort to uncover information that may provide an edge. Thus, as small-capitalization stocks have become a larger component in institutional portfolios, it's likely that more research is being conducted on this subset of the market. Indeed, as a proportion of outstanding shares for any given firm, the institutional ownership percentages shown here seem to indicate that there is a disproportionate interest in smaller firms—maybe institutional investors are actually looking at small-capitalization firms more intently than they're looking at larger enterprises. Indeed, to this end, it may not be surprising that as time has gone by, studies looking for a neglected-firm effect seem to show no evidence that one exists. An alternative explanation to the institutional ownership percentages shown earlier could concern differences in types

of companies that larger enterprises represent. It could be that employees account for a larger proportion of large-cap company investors, as these firms have likely been around a longer time than smaller companies. Or it could be that if noninstitutional investors are to hold individual common stocks of any kind, they hold the common stock of big companies. I think in the end, however, one can safely conclude that the neglected-firm effect is not likely present in large-cap stocks.

Also, I don't believe the recently passed financial crisis is an outlier in this assessment. While much has been made of the risk that large banks took on during the financial crisis, the largest issue that continues to affect valuation is the assessment of underlying values for residential housing (either directly in underwriting or indirectly in the valuation of securities tied to real estate). There were two main underlying assumptions that were very prone to behavioral biases that drove both underlying valuations and the ultimate solvency of some banks: overoptimism with regard to real estate values and an underestimation of the volatility of derivative securities tied to residential real estate. Estimates for both of these factors were inappropriately based on a historical record of price changes (in residential real estate or derivative bonds), either exclusively or overly weighted as a probability. The historical record indicated that prices were more stable than they ultimately turned out to be. Success in investing in banking stocks during this time period was not predicated on finding a smoking gun in bank 10-Ks. Nor was it due to a lack of investigation on the part of analysts. In short, representativeness biases likely played a much larger role in errors in bank valuation than did any other factor related to the analysis of this industry.

Unfortunately, investors often organize their processes to identify structural impediments, whether they are likely present or not. This is true of a number of large-cap managers as well. Doubly unfortunate is the fact that many managers strive to achieve their goal of identifying "gems" among the largest issues by focusing on the highest-growth companies where uncertain attributes such as near-term growth require both outsized abnormal growth rates and overly long abnormal growth duration periods. It's not surprising that the two stocks that have the most analyst coverage are Apple and Google. Both of these stocks have had extraordinarily high growth rates in sales and cash flow in recent years. Given their size in the market, implicit within their valuations are continued track records of growth or high margins. While I'll delve into the problems associated with these short-term growth characteristics in Chapter 9, they are prime scenarios in which an analyst is able to purport to "dig deeper." As an aside, there is a behavioral element to this tendency on the part of analysts to claim expertise in the most uncertain

of situations. Clearly, there is a significant amount of hubris in those who believe that they can identify information that many, many others cannot. In truth, they simply believe they have the best crystal ball that can see the furthest into the future.

This is not to say that market opportunities don't exist in small-capitalization stocks, illiquid markets, underfollowed securities, or more lightly regulated markets. Also, the behavioral inefficiencies discussed in Chapter 5 and expanded on in the next two chapters, are likely magnified by some of these structural impediments. However, it's disingenuous to say that anomalies or opportunities for profit exist due to a stock's simply being small in size or underfollowed. There is a lot going on when it comes to how the market sets prices, and there are a lot of investors looking at stocks of all sizes. Much of what we consider to be opportunities are simply cases where other factors are at work—illiquidity or more risk, for example.

## Conclusions

If we presume that research pays off, then we need to determine why markets are inefficient and what we should strive to capitalize on.

Over the course of the past three chapters, I've considered market inefficiencies from two different perspectives:

1. **The Behavioral View:** Behavioral views of market opportunities are not relevant to the EMH, but are a rejection of the Fama-Freidman theories that comprise the conventional view of market efficiency.
2. **The Conventional View:** The conventional view of market efficiency concerns structural impediments to an efficient market and is a rebuttal of various forms of the EMH.

While preceding chapters have made my thoughts on the behavioral view clear, the point of this chapter is that structural impediments are not as fertile grounds as one might expect. The conventional view of market inefficiencies is a flawed view. From a rationale standpoint, when looking for reasons why a company may be selling at a discount from intrinsic value, it's likely not the case that such deviations are due to a lack of following in the sell-side investment community. It's also not likely that it's simply due to liquidity or the market in which the company is traded.

Still, it's a part of the American spirit to believe that research can be more exhaustive and that little "gems" are out there to be uncovered. Do these

exist? The research on this topic would seem to indicate that they probably do not exist in the realm of mid- to large-cap stocks. If we presume that we can think better, dig deeper, and do a better job at modeling a valuation, it would follow that underfollowed stocks would present the best opportunities to capitalize on these abilities. Once again, research seems to indicate that underfollowed stocks don't provide a fertile ground for uncovering mid- to large-cap bargains.

Moreover, when one examines a mid- to large-cap manager's process, hopefully one concludes that strategies that claim to identify opportunities by "digging deeper" are misguided. This is not to say that managers and analysts shouldn't thoroughly research a company. On the contrary, fundamental analysis, with a concerted effort to unearth all of a company's skeletons and illnesses, is extraordinarily important. However, if one is not taking into account the myriad ways in which one's decision making (as well as others) can be skewed or prone to errors, then one's research is missing the key element to mispricing.

Additionally, there is a corollary that is more relevant to this book. Often, it is presumed that mid- to large-cap stocks are not fertile grounds for stock picking, as they generally don't lack for research coverage, are very liquid, and in the United States have a number of regulations that ensure quick and complete dissemination of information. Much of the research pertaining to underfollowed common stocks, while not pointing to a source of investment opportunities, also doesn't disqualify any group (such as large-cap common stocks).

So, if we aren't looking for underresearched or illiquid stocks, then what should we be looking for? The two chapters that preceded this chapter point us in a more logical direction. To this end, in Chapters 8 and 9 we'll look at how we can shape our investment process to uncover value in mid- to large-cap stocks. Understanding our innate behavioral biases plays a large role, as a philosophical foundation on which to consider the assumptions that underlie valuation.

## Appendix: Underexplained Market Phenomena

There is no guarantee of profit in any trading or investing heuristic. However, I would assert that having an understanding of why something may be mispriced in the market does much to improve one's chances of profiting from it. In terms of practicality, the least actionable group of market anomalies are ones that I refer to as *underexplained* phenomena. These market anomalies are

generally grouped with behavioral theories as they relate to the inefficiency of markets. While they do undermine the weak form of the EMH, they are less understood and don't have direct behavioral theories tied to their occurrence. Moreover, what we generally find is that many of these market anomalies are inconsistent and are not profitable, after considering transaction costs.

Still, in an effort to offer a broad understanding of market opportunities and market inefficiency, I think it would be a disservice to simply ignore the fact that market anomalies exist. While I'll not spend too much time on this topic, hopefully one will come away with a basic understanding of what anomalies to efficient market pricing exist, and their relevance or irrelevance to the identification of actionable market opportunities.

Many of these anomalies take the form of calendar or seasonal effects. While it is often the case that there are researchers that posit a theory to explain these inefficiencies, they are often not very well explained. Moreover, they also appear to be largely not very actionable. The anomalies are not consistent from year to year and the magnitudes of price differentials (from expectations) tend to be too small to take action on and profit from. Still, they appear frequently enough to pose a challenge to a strict acceptance of market efficiency—and also, I would add, the weak form of the EMH.

Calendar effects, also known as seasonal effects, were first identified by academic researchers in the 1970s and 1980s. While some of these effects seem to be based upon fundamentals or the structure of our society, others seem rather spurious and possibly the result of data mining.

As early as 1980, Kenneth French found that "although the average return for the other four days of the week was positive, the average return for Monday was significantly negative . . . " for a time series that covered 1953 through 1977. While French noted that the "persistently negative returns for Monday appear to be evidence of market inefficiency"; he concedes that a trading strategy based upon these findings would "not have been profitable because of transactions costs."[12]

Similarly, examining 90 years worth of Dow Jones Industrial Average data, Lakonishok and Smidt (1988) confirmed French's findings regarding turn-of-the-week effects, but also found that preholiday rates of return for their data set were generally two to five times larger than preweekend rates of return.[13]

It's worth noting here that the preceding effects, while present in studies undertaken with two different data sets (the S&P 500 in the case of French and the Dow Jones Industrial Average [DJIA] in the case of Lakonishok and Smidt), provide evidence but no underlying theory. It may be that there is a

rational explanation that explains these two anomalies, or it may be that there is an irrational explanation that explains these anomalies.

I do know that my own spirit brightens around holidays, and one is often disheartened to see the weekend come to an end. The weekend always seems to brighten people's moods, as people look forward to weekend activities and leisure. Alternatively, as the weekend comes to a close, one's mood would likely darken. Moreover, various holidays can be festive and will often put individuals into a mood that is much more optimistic and euphoric than one finds at other times in the year. Could it be that our mood, shaped by our subconscious appreciation of holidays and leisure, is leading us to investing or trading activity that reflects a festive spirit rather than fundamentals? I think it is likely the case, as I've seen it in my own attitude and the attitudes of others. However, Burton Malkiel, who often critiques market anomalies, correctly identifies the primary difficulty in fashioning a strategy that capitalizes on these types of anomalies, when he notes that the "general problem with these predictable patterns or anomalies . . . is that they are *not* dependable from period to period."[14] So, it may be that a pattern exists, but the ability to consistently take advantage of the opportunities is likely not sufficient to warrant an investment strategy.

Finally, I think it's worth considering one other stock-price-related anomaly that seems to persist in a fairly regular fashion: the January effect. The January effect, first identified by Rozeff and Kinney[15] posits that stock returns in January are materially higher than returns in other months. Looking at a data series on U.S. stocks that spanned the period 1904 to 1974, Rozeff and Kinney calculated that returns in January averaged 3.5 percent, while returns for other months averaged 0.5 percent. While some determined that this pattern was a rationale reaction to tax loss selling (Reinganum[16]), others conducting research in countries with no capital gains taxes (such as Japan and Canada prior to 1972), identified a January effect as well. This effect was reexamined in 2006 by Mark Haug and Mark Hirschey, who concluded that the "January effect is a real and continuing anomaly in stock-market returns, and one that defies easy explanation."[17]

While I've discussed a handful of market anomalies, this has hardly been an exhaustive enumeration of underexplained phenomena. One could examine weather-related effects (Tufan and Hamarat[18]), sports-based effects (Edmans, Garcia, and Norli[19]), daylight savings effects (Kamstra, Kramer, and Levi[20]) and others. However, outside of some of the more behavioral-oriented explanations that I posited previously, these types of anomalies are interesting only insofar as they persist in an environment that is so-often considered efficient. In the end, the main problems that I have with anomalies that I've

grouped under the term *underexplained* is that they provide very little in way of exploitable return and/or they are, as Malkiel noted, a bit undependable.

Finally, as a practitioner, the ability to explain why a security or industry or sector or market is mispriced is paramount. Within the sea of market efficiency, why is this group or stock adrift? There must be a reason why we question market efficiency, and my guiding principle with regard to approaching stock research is to assume at the outset that the market has efficiently priced a stock. If a stock is mispriced, we must at the very least have a reason for believing that the market is in error. In the absence of even a crude understanding of why a company is undervalued (or overvalued), we lose the ability to differentiate between misunderstood situations and situations that may present opportunities.

As research analysts attempting to identify exploitable market opportunities, it behooves us to understand the nature of market inefficiencies. While many of the anomalies I've described have no solid explanation, differentiating between inefficiencies that result spuriously and those that result from behavioral errors helps one to understand the broader view of market efficiency.

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PART THREE

# Research and Portfolio Management

# CHAPTER 8

# Identifying Large-Cap Stock Opportunities and Optimizing Research Processes

This chapter and the next will focus on how to identify and analyze large-capitalization stocks. While Chapter 9 will examine what I believe is the most important element of individual security analysis, short-term growth estimates, this chapter is more concerned with the "front" of the process. The front of the process is primarily focused on identifying candidates for further research and structuring an organization in order to avoid insidious behavioral errors.

At the start, we are most concerned with three factors:

1. Identifying opportunities and avoiding pitfalls
2. Maintaining a disciplined process
3. Winnowing a universe down to a smaller number

While I'll discuss some more specific methods that we use later in this chapter and in the next two chapters, I believe the most important element to our process is our understanding of how opportunities materialize. If there is one thing that you take away in reading this book, I hope it is that you understand that you can't find undervalued mid- to large-cap securities without understanding the reasons why those securities are undervalued.

As was discussed in Chapter 7, with thousands of research analysts covering domestic mid- to large-cap stocks for both sell-side Wall Street brokerage research departments and buy-side investment management companies, the market is dissecting and evaluating each common stock on a second-by-second basis. We must always come to research with the thought that those who are trading and those who are researching stocks are doing a fairly good job and thus the stock is probably fairly priced. When we look at an opportunity, be it a very large company such as General Electric Company or a mid-cap company like Gap Inc., we always start with the premise that the company is fairly valued. Any error in the valuation on the part of the broad market's participants is not the result of *lack* of research. Moreover, any error in the valuation is not the result of a lack of effort on the part of thousands of analysts to find a piece of information hidden in the financial statements that others will not find.

In the large-cap subset of the market, valuation errors are largely the result of cognitive biases. If an error in pricing or valuation is present it is likely found in the assumptions that underpin intrinsic value computations. Underlying assumptions are fertile grounds for finding biases that reflect overly optimistic views or overly pessimistic views. Unfortunately, errors in underlying assumptions that result from behavioral errors are trickier to find, as the motivations for them affect us as well.

This chapter will start with a broad introduction to the identification of large-cap stock opportunities. I'll then more specifically discuss filters and relative assessments of value and the subjective identification of overoptimism and overpessimism. I'll end the chapter with some thoughts on overconfidence, information overload, and the structure of investment firms.

## Identifying Large-Cap Stock Opportunities

As I noted at the end of Chapter 7, trying to identify information that others are not finding in financial statements and other public information is likely a fool's errand. But if we are not parsing through Securities and Exchange Commission (SEC) 10-K filings and 10-Q fillings, then how are we to identify purchase candidates? In short, we have two methods, one very objective and one much more subjective:

1. Filters or algorithms that seek to identify securities that are relatively cheap.
2. Subjective assessments of situations that may afford opportunities accruing from investor behavior.

Both of these methods attempt to arrive at the same destination.

It is in the filtering of databases that we see the link between more generalized value-oriented processes and processes that are underpinned by behavioral insights. The difference will at times be indistinguishable, and the results may be indistinguishable. In short, in filtering large databases of common stocks, using relative valuation metrics as a parsing mechanism, we are looking for "cheap" stocks. The underlying assumption is that the "cheapness" of a company's shares will reflect an overly pessimistic view of the company. Sometimes, upon further reflection and research, we will find this to be the case. Often, however, shares will reflect a reasonable assessment of the company's prospects. In short, filtering is but a starting point in what will be a relatively long process. Unfortunately, along the way we will kiss a lot of frogs and most will remain frogs. Filters are a very useful tool one can use to winnow a universe of 1,000 or more securities into a more manageable subset. Moreover, filters are a solid foundation on which to build an investment process, they lend rigidity and discipline to what is necessarily a very subjective endeavor. It is not an intuitive leap to acknowledge that cheap stocks are more likely to have an inordinate amount of overpessimism associated with them, while relatively expensive stocks are more likely to have an inordinate amount of overoptimism associated with them. While less objective methods can be used to arrive at the same conclusions, the more that we allow our judgment to cloud our initial parsing of our universe, the more likely we are to allow behavioral biases to creep into our processes.

Still, at the end of the day, we must always be questioning why the stock is undervalued. It's not enough to simply note that a given company's financial metrics indicate it is undervalued. We are always making a subjective assessment of the behavioral elements that underpin underlying assumptions in the calculation of intrinsic value and, less rigorously, valuation of the company in the market. Consequently, we are at some point going to come around to the second method cited earlier, the quest for situations that appear to be subject to an inordinate amount of optimism or pessimism.

It's worthwhile delving into both of these methods, as they pertain to large-cap stock research, so in the next two sections I'll discuss each in greater detail.

## Filters and Relative Assessments of Value

While filters can provide a very good starting and ending point for a large portfolio with 100 or more securities, when looking to put together a portfolio that is more focused, they shouldn't be used singularly, but rather as a

starting point. With larger portfolios (in the number of stocks), any errors accruing to the point-in-time nature of filters are less significant, as it may be one stock out of 100 or 200 stocks. When one is putting together a 30-, 40-, or 50-stock portfolio, the effect that one holding can have on the portfolio is too great. In the case of a 30-, 40-, or 50-stock portfolio, I would always recommend that significant additional research be conducted in order to feel confident that the opportunity is "real." As I'll discuss in Chapter 11, the successful large-cap portfolio will be more concentrated, given the concentrated nature of benchmarks. Thus, while processes that are largely quantitative in nature are appropriate for broader opportunity sets (such as small-cap strategies, all-cap strategies, and global strategies), they're less effective in building a successful portfolio from a large-capitalization universe.

There are two types of filtering criteria that can be used as the basis for identifying undervalued securities that may be subject to behavioral biases:

- Relative valuation criteria
- Relative valuation criteria augmented by driver variables

First, as was noted in Chapter 4, value-oriented investment criteria, such as price-to-book (P/B) ratios and price-to-earnings (P/E) ratios can reflect inordinate pessimism in a stock. While often low P/B stocks have low valuations for a reason, there are cases when representativeness heuristics and framing heuristics may cause a company to be priced too low. Note, however, that focusing on P/B and P/E ratios singularly will often lock one out of wide swaths of the overall broad market. While I would advise that one stay away from new technology companies trading at significant market multiples, and implied growth rates, there are a number of seasoned technology companies with significant barriers to competitive threats that trade at reasonable valuations, but will never make the short list of a simplistic P/B or P/E ranking of stocks. Companies like IBM, Microsoft, Oracle, Intel, and Apple Computer are all legitimate portfolio prospects with significant cash flow–generation abilities and either formal or informal competitive barriers. However, many of these companies will fail to make a list of undervalued companies, even in the worst of times. And while many of these companies may not look undervalued on a P/B or P/E basis, they can look undervalued in intrinsic value computations. Moreover, in looking at a company on a P/B basis, we are looking at only two pieces of information: market price and accounting book value. Book value is appealing as a valuation tool, as it is not affected by forward assumptions and the behavioral errors than can accompany them. Price, as was noted previously, is likely affected by behavior biases on a regular

basis. In using a metric like P/B, there is an implicit relationship to an intrinsic valuation calculation; however, this relationship is neither intuitive nor easy to see in the metric itself.

To understand this, it's important to understand the relationship between relative valuation metrics such as P/E and P/B and the calculation of intrinsic value. Intrinsic value is generally the arbiter of valuation. It is a true reflection of the company's prospects, and it encompasses all of the necessary components to determining if a company is undervalued. If done objectively and accurately, it can be used as a fairly good assessment of value. We can relate the calculation of intrinsic value to relative valuation measures quite easily.[1] Let's start with the simplest of valuation models, the stable growth dividend discount model, or DDM. The intrinsic value to a share price ($P_0$) in a stable growth DDM is the next period's dividend ($Div_1$) divided by the difference between the company's equity discount rate ($k_e$) and the steady-state dividend growth rate ($g_n$). Formula 8.1 is used to calculate the intrinsic value of a share of common stock, as shown below.

$$P_0 = \frac{Div_1}{(k_e - g_n)} \tag{8.1}$$

If we rewrite this formula in terms of earnings per share ($EPS_1$), calculating the dividend received in the next period ($Div_1$) as a function of earnings and the company's payout ratio, we would get the formula found in 8.2.

$$P_0 = \frac{EPS_1 \times \text{Payout Ratio}}{(k_e - g_n)} \tag{8.2}$$

Then, rewriting earnings per share ($EPS_1$) in terms of return on equity (ROE) and book value per share at the start of the period ($B_0$), we get an expanded formula, as shown in 8.3 below.

$$P_0 = \frac{B_0 \times ROE \times \text{Payout Ratio}}{(k_e - g_n)} \tag{8.3}$$

In order to equate this classical notion of intrinsic value to P/B ratios, we start by dividing each side by book value ($B_0$). In doing so, we arrive at the equality shown in 8.4.

$$\frac{P_0}{B_0} = \frac{\text{ROE} \times \text{Payout Ratio}}{(k_e - g_n)} \tag{8.4}$$

As $g_n = (1 - \text{Payout Ratio}) \times \text{ROE}$, which itself = ROE – (ROE × Payout Ratio), we can rearrange the numerator, arriving at the equality found in 8.5.

$$\frac{P_0}{B_0} = \frac{(\text{ROE} - g_n)}{(k_e - g_n)} \tag{8.5}$$

This equality tells us two things:

1. When a company's ROE is equal to its cost of equity, it should trade for about book value.
2. A company's P/B ratio is an increasing function of ROE.

All else being equal, in a simplistic sense, a higher ROE should support a higher P/B ratio. Within this relationship, ROE is sometimes referred to as a driver or companion variable with regard to P/B. As a company's ROE moves higher, it should drive the company's share price higher, as a higher ROE supports a higher P/B ratio, all other things being equal.

Also, we can in a similar manner establish an equality between a P/B ratio and a multistage free cash flow model, and the result would largely be the same. Similar exercises can be completed relating P/E ratios and price-to-sales (P/S) ratios. In these cases, the driver variables are different, as shown in Table 8.1.

The often used PEG ratio, or P/E divided by expected growth, is a reflection of the importance of the companion variable on relative valuation measures. Measures reflecting ROE's importance to P/B or the importance of net margin to P/S can also be constructed to reflect these important relative attributes. Note, however, that at the end of the day, whether we are using a P/E

**TABLE 8.1** Relative Valuation Measures and Driver Variables

| Relative Valuation Ratio | Driver Variable |
|---|---|
| P/B ratio | ROE |
| P/E ratio | Earnings growth rate |
| P/S ratio | Net margin |

ratio or a PEG ratio, we are using a relative valuation measure. One explicitly recognizes the relationship between valuation and the growth prospects of a firm (which is reflected in ROE, earnings growth rates, and margins), while the other implicitly assumes that we recognize this relationship. Storied investor Warren Buffett, often described as a *value* investor, has noted as much, explaining in Berkshire Hathaway's 1992 letter to shareholders that:

> . . . most analysts feel they must choose between two approaches customarily thought to be in opposition: "value" and "growth." Indeed, many investment professionals see any mixing of the two terms as a form of intellectual cross-dressing.
>
> We view that as fuzzy thinking (in which, it must be confessed, I myself engaged some years ago). In our opinion, the two approaches are joined at the hip: Growth is always a component in the calculation of value, constituting a variable whose importance can range from negligible to enormous and whose impact can be negative as well as positive.[2]

The use of companion variables when using relative valuation measures will push one toward strategies that are largely characterized as "growth at a reasonable price" strategies. At Jones Villalta Asset Management, we are practitioners of this type of investing and don't consider ourselves *value-oriented* or *growth-oriented*, but instead opportunistic. Still, insofar as the terms *growth* and *value* are descriptive, they do, I think, give individuals a sense of where a manager places the most emphasis. In this regard, we would likely be considered a *value* manager.

As one looks for purchase candidates, screening databases of large-capitalization stocks, one can focus on low P/B stocks and select stocks based on this valuation criteria. This is a valid manner in which to build a portfolio of companies that are likely being negatively affected by behavioral factors. However, keep in mind that, given the relationship between intrinsic value and relative measures of value such as P/B ratios and P/E ratios, one is likely summarily excluding a number of potentially undervalued stocks as well as whole industries.

Take, for example, Microsoft Corporation (MSFT), which trades at a lofty valuation of more than four times book value. On a relative basis, using P/B as a measure of value, MSFT would look rather richly priced to someone seeking undervalued stocks. However, MSFT has a very strong competitive position, benefits from the network effects of a dominant (some would say monopolistic) position in parts of the software industry and has products that have a fair amount of protection under copyright laws. Moreover, MSFT

now has a relatively diverse revenue stream (geographically and along product lines). There is always the potential that a company is unable to sustain high returns on their invested capital, and certainly a company's position can change dramatically over time—from a margin and return standpoint. However, given the aforementioned protections, we suspect that MSFT should be able to support returns on equity that exceed the company's cost of capital. Indeed, MSFT has produced ROEs of in excess of 30 percent per year over the past five years—throughout a recession and in spite of having a fairly high cash position (causing a drag on returns). I can and have argued that MSFT is undervalued at the present time. Indeed, we own MSFT in our mutual fund, as well as in our separate accounts at Jones Villalta Asset Management. To exclude MSFT simply due to a convention of relative valuation that is likely overly simplistic is, in our view, shortsighted.

It is instructive to look at a ranking of stocks ranked by "valuation" in terms of the relative valuation measures. Using the Value Line Investment Analyzer as a tool for this purpose, I can screen the 200 largest stocks in the domestic stock market, based on an expected ROE to P/B metric and a P/E to expected growth metric. The expected ROE to P/B metric is a contrived metric that I'm using to relate book value to ROE. By dividing ROE (multiplied by 100) by P/B, we arrive at a relative valuation measure where the largest resulting figure is considered the most undervalued. For example, if the price of a stock equaled its book value (a P/B = 1.0), and the company was expected to generate returns on equity of 10 percent, then the expected ROE to P/B metric would equal 10. Similarly, if a company's P/B ratio was 2.0, and this same company was expected to generate a return on equity of 10 percent, then its expected ROE to P/B value would equal 5. It would be overly simplistic to say that the former company with the expected ROE to P/B value of 10 is undervalued in comparison to the latter company with an expected ROE to P/B metric of 5, but this is essentially the resulting message. It is up to the analyst to determine if there are other attributes that will cause one to determine that the former company with an expected ROE to P/B value of 10 is indeed undervalued. As I noted in the beginning, I don't think these simplistic measures are starting and ending points, but I do think they are objective starting points. Screening Value Line's database, using the 200 largest stocks as a universe, we arrive at the top-10 lists found in Table 8.2.

For perspective, the range of values for the Expected ROE to P/B metric (excluding 14 stocks with missing information) was between 17.51 and 0.69, with a median of 7.03. The range of values for the P/E to growth metric (excluding 12 stocks with negative values or missing information) was between 0.29 and 37.45, with a median value of 1.35.

**TABLE 8.2** Top 10 Stocks of 200 Largest by Market Capitalization

| Ranked by Expected ROE to P/B | | | Ranked by P/E to Expected Growth | | |
|---|---|---|---|---|---|
| | Exp. ROE to P/B | P/B | | P/E to Exp. Growth | P/E |
| Capital One Financial | 17.52 | 0.66 | Capital One Financial | 0.29 | 6.66 |
| MetLife Inc. | 17.03 | 0.59 | Morgan Stanley | 0.33 | 5.42 |
| Freeport-McMoRan | 16.29 | 2.27 | Bank of New York | 0.33 | 7.69 |
| Citigroup Inc. | 16.08 | 0.44 | J.P. Morgan Chase & Company | 0.41 | 8.21 |
| Goldman Sachs Group, Inc. | 15.06 | 0.70 | Applied Materials | 0.41 | 11.39 |
| Prudential Financial | 14.08 | 0.64 | Dow Chemical | 0.45 | 9.37 |
| J.P. Morgan Chase & Company | 13.51 | 0.78 | Activision Blizzard | 0.47 | 14.16 |
| Chevron Corp. | 13.41 | 1.75 | MetLife Inc. | 0.48 | 6.11 |
| Corning Inc. | 13.28 | 0.94 | Cummins Inc. | 0.50 | 9.47 |
| Morgan Stanley | 13.11 | 0.50 | DIRECTV | 0.51 | 10.85 |

*Data Source:* Value Line Investment Analyzer, December 31, 2011.

Importantly, these lists are very heavy in financial stocks at the present time. While financial stocks comprised 13.43 percent of the Standard & Poor's (S&P) 500 Index at the point when this filter was run, financials comprise 70 percent of the top 10 stocks in the expected ROE to P/B list, and 50 percent of the top 10 stocks in the P/E to expected growth list. This isn't necessarily a cause for concern, and I think points to underlying value in the financial sector, but for some investors, this proportion may prove to be too great, given regulatory constraints (for a diversified mutual fund) or in terms of keeping investors comfortable with volatility. In using these types of measures, I've found that occasionally industries or sectors will dominate resulting rankings. Energy stocks, financial stocks, materials stocks, in short, any group that is likely to be affected by commodities, will occasionally trade in tandem. For financial stocks, the commodity is money.

For comparison purposes we can look at this 200-stock universe ranked by P/B ratios and current P/E ratios, as seen in Table 8.3. The results have a significant amount of commonality but some differences as well. On a P/B basis we find that every stock in the top 10 stocks in the 200-stock universe is a financial company. On a P/E basis, this same universe also has a significant proportion in financial stocks, but a handful of technology and cyclical companies.

Relative valuation measures can be extraordinarily useful in identifying investment opportunities in the large-cap subset of the market, but as noted previously they should not be considered a surrogate for intrinsic value

**TABLE 8.3** Top 10 Stocks of 200 Largest by Market Capitalization

| | P/B | | Current P/E |
|---|---|---|---|
| Bank of America | 0.29 | Bank of America | 5.25 |
| Citigroup Inc. | 0.44 | Morgan Stanley | 5.42 |
| Morgan Stanley | 0.50 | General Motors | 5.46 |
| American International Group | 0.57 | Ford Motor | 5.49 |
| MetLife Inc. | 0.59 | Citigroup Inc. | 5.77 |
| Prudential Financial | 0.64 | Freeport McMoRan | 6.09 |
| Capital One Financial | 0.66 | MetLife Inc. | 6.11 |
| Goldman Sachs Group, Inc. | 0.70 | Capital One Financial | 6.66 |
| Bank of New York | 0.72 | Aflac Inc. | 6.98 |
| CME Group | 0.77 | Prudential Financial | 7.11 |

*Data Source:* Value Line Investment Analyzer, December 31, 2011.

computations. They are crude measures that should be used as starting points, not ending points. When we have identified a purchase candidate, whether it is from a formal filter using measures described above, or from an ad hoc assessment of market opportunities through subjective examination, the next step is to ask why this is the case. Why is this firm trading at a discount to its peers, industry, sector, or market? But, more importantly, consider that there are possibly hundreds if not thousands of analysts who are looking at a particular stock and making investment decisions based on their analysis. These decisions have an impact on the price—if people see relative value (value above the current share price) in a company, purchases should drive the share price higher. Of course, the alternative is certainly possible as well—if people believe there is no relative value in a company, a lack of purchases or sales should drive the share price lower. In short, there are many investors at work in the market every second of the day making these decisions, and these are generally very smart individuals.

But this is not to say that there are not correlated mistakes being made in an assessment of some of the assumptions underlying valuation estimates. Behavioral biases inhibit assessments of value. The propensity for these biases to drive euphoric valuations or overly pessimistic troughs in pricing should not be underestimated. After we think we've identified an undervalued stock or sector of the market the next step is to determine if there are indeed behavioral biases affecting the stock's valuation by market participants.

## Subjective Identification of Overoptimism and Overpessimism

Is there a mood to the market? I often ask our people at Jones Villalta if there is a tenor to the current discussion. Is there an underlying mood that, while not on the surface, is a pretext for action? It can be euphoric at times and dismal at times. In some cases, this is directly related to the feedback mechanisms discussed in Chapter 6, and a mood will be reflected in changing cultural tastes or via other profit generating mechanisms (such as the production of TV shows or the proliferation of retailers).

In the late 1990s, the tenor was inescapable. New paradigm thinking, a world where research appeared superfluous, as stocks of *good* companies moved forward as they should—until, of course, they crashed. Housing in the middle of the 2000s took on a similar tone. As was discussed in Chapter

6, the drumbeat for the *American dream* was a siren song that was hard to escape. Indeed, the banks did not escape it, as we found in late 2008. As we turn into a new decade, the tone has changed dramatically from the go-go-bull-market years. While the market moved significantly higher in 2009 and 2010, outflows from domestic equity mutual funds were decidedly negative. But, more importantly, the tone we hear from market pundits, the tone of news journalists is very, very different. There is no euphoria; every positive is couched in caveats. This tone is more reflective of what individual investors are doing in the mutual fund market, where domestic equity mutual fund flows were negative in 2007, 2008, 2009, 2010, and 2011. While there is giddiness in some sectors and industries—namely, social networking and cloud computing stocks—this is not the late 1990s. The drivers of this market are not the private or newly public companies that are capitalizing on social networking trends and cloud computing. These firms are not significant enough to drive market averages, and the technology behemoths that may capitalize on these new multibillion-dollar companies are not seeing their shares respond in tandem.

What happens in the market is at times a reflection of the mood of the market; this was the case in the late 1990s. Sometimes, what is happening in the market is happening in spite of the dour mood. The market's upward march in mid-2009 and 2010 was seemingly bullish, and some referred to it as out of touch with fundamentals. However, you certainly couldn't call it euphoric. It was different; the market's move was not a reflection of the mood of investors. However, there are some professional managers (myself included) who view the current mood as overly pessimistic and see significant value in current share prices for a range of stocks in different industries. While many successful money managers have positioned portfolios for economic and market growth, others who opine on such matters are more skeptical. In examining the market's mood in early 2012, I would summarize the data points as follows:

- The tone from media and market pundits is at best balanced and at worst negative. News stories on the market are couched in such a way that viewers cannot help but maintain a skeptical view.
- Professional investors (those managing domestic equity mutual funds) are relatively bullish in action but mixed in their commentaries. Their views are at worst mixed (or balanced) and at best optimistic.
- Domestic equity mutual fund flows are decidedly negative. Individual investors remain risk averse, and to a lesser extent so are institutions.

- Volatility is very pronounced, with each data point (be it jobs-oriented, gross national product, or Institute for Supply Management data) a cause for reaction—positive or negative. This indicates a general risk aversion, in our view.

Obviously, there are other points that one could include in this assessment, so certainly this is not all-encompassing. And I would note that this exercise is not meant to be a call for action at the present time (although I could make the case that it is), but rather an example of how we tend to look at the market and gauge the tone of the market environment. But, in summarizing the above, I would conclude that there is at worst a balanced assessment of the market at the present time (which is early 2012) and at worst a negative view of domestic stocks or risk.

But my larger point is not that this is a reason to be invested, or a reason to get broadly into the domestic stock market. My larger point is that if we look at how the mood of the day affects our approach to valuation, and our approach to inputs, the present mood, I believe, is skeptical or mixed. I don't see excess. This is not to say that the market will not continue to be volatile or not move lower, but it is to say that there is no euphoria or excess. From a valuation standpoint, this is a good thing and a positive for stock pricing.

As a manager of mid- to large-cap stocks, this is important. As noted in prior chapters, our concern with regard to valuation is not that we are missing something or that others are missing something in their assessment of a company's growth prospects or fundamentals. Our concerns, as they pertain to mid- to large-cap domestic stocks pertain more to investor behavior. It is general (market) or specific (with regard to industries or specific stocks) overoptimism that is the concern for investors in the large-cap segment of the market. Note also that this is neither a top-down assessment for stocks nor a substitute for fundamental analysis. This is a part of fundamental analysis. This assessment of mood should guide us in taking a more or less skeptical view of data that underlie important assumptions in valuation.

As we move down to companies specifically, it is easier to see moods change. The aforementioned social networking and cloud computing segments of the information technology sector point to, without a doubt, overoptimism. Financials, however, are difficult to praise at the present time, as we come out of a financial crises and continue to contend with significant uncertainties.

In short, I would not advise investing in niche, pure-play mid- to large-cap stocks in an area where I think the mood is undoubtedly overly optimistic. Do we miss out on some opportunities? Without a doubt. These are

the errors of omission that one has to simply be content with. In the small-cap subset of the market, taking a small position in a high-growth company within a burgeoning industry can be reasonable, as the revenues and earnings that support small-capitalization valuations are much lower than they would be for large-cap stocks. At a certain point for large-cap stocks, the size of the company and the prospects for significant growth in the share price become problematic, as the revenues and/or margins necessary to support a larger market capitalization are significant. More to the point, however, is that the assumptions that underpin valuations in industries or stocks with significant overoptimism are likely themselves overly optimistic. They are prone to underwhelm and underperform over the long term, as overly optimistic assessments are met with actual growth or margins that are good, but less than originally expected.

Financials, however, in early 2012, are a different story. Without delving into the financials and growth prospects of large financial institutions, what can we say about the mood with regard to financials?

1. The political environment is openly hostile:
   - Large banks make for very good examples of what's wrong with our regulatory environment.
   - Large banks are often used, pejoratively, in terms of campaign contributions or votes.
2. The social environment (main street view) is openly hostile:
   - Banks were "saved," while borrowers were left to fend for themselves.
   - A grassroots movement, the "Occupy Wall Street" movement, took shape in mid-2011 and has spread worldwide.
   - Banks are commonly the butt of jokes, or named disparagingly in conversations.
3. No other industry is beset by as many different uncertainties:
   - New global (Basel III) capital rules.
   - New emerging domestic regulatory rules and framework (Dodd-Frank).
   - The housing market, a main source of collateral for banks, remains mired in a depressed state.
   - European Union countries grappling with debt problems could pose still more losses for banks.
   - Employment is high, heightening concerns with regard to the wherewithal of bank customers.

The tone is certainly negative. My larger point with regard to financials is not that we should feel sorry for financial firms. Nor am I suggesting that larger financial institutions didn't bring this on themselves. The larger point

is that when we approach valuation assumptions, what are we, as practitioners, bringing to the table in terms of our behavioral biases? I'll talk more about growth in the next chapter, and how growth and long-term earnings drive valuation. But in approaching the valuation of financial institutions, are the current environment and short-term performance of large financial institutions disproportionately influencing our assumptions with regard to the long-term profitability and the success of these institutions? If you were to bet on whether the mood with regard to financial institutions is overly optimistic, overly pessimistic or evenly distributed, what would you bet? And does this mood bleed into the assumptions that underlie valuation? One can see how representativeness biases could be present in the current environment. Framing affects are also likely to be present, especially given the regulatory debate going on. Once again, this is not a substitute for fundamental analysis, but it is a starting point in taking a more encompassing perspective on the assumptions we make in approaching valuation.

## Overconfidence, Information Overload, and the Structure of Investment Firms

While investment management processes are extraordinarily important, the structure of the organization can also play a pivotal role in fostering behavioral errors on the part of analysts and portfolio managers. Two interrelated mechanisms, industry specialization and degree of company contact, can work independently or in combination to sway objective assessments of valuation. While these issues are not relevant for the amateur practitioner, they are relevant to most professional research firms. Consequently, I do think they are worth discussing in the context of investor behavior.

Hubris is the enemy of many enterprises. As humans, we willfully succumb to it, and we constantly fight its effects on our decision making. There is a documented human tendency to believe that our outcomes are different than the average person's.[3] Our access to information has tended to promote a general overconfidence in many individuals—regardless of the endeavor.

With this in mind, growing older in the age of the Internet has its benefits and drawbacks. On the one hand, we have a significant amount of intellectual capital at our fingertips. It would amaze analysts in Benjamin Graham's time that we can call forth not only annual SEC financial filings but also the opinions of professionals and nonprofessionals alike. In no subset of the market is this truer than in the large-cap segment, where there is an abundance of professional analysis, journalistic conjecture, and data of

all kinds. When I type the words "Apple Inc." into Google, over 50 million results show up! True, most of the results are either unrelated to stock research or are immaterially related to assumptions that could be used in a valuation of the company's shares. However, there is no doubt that at the present time we have more information available to us, as individuals, than any population in the history of the world. Also, we have more tools to process this information. From Google filtering algorithms to PDF character recognition software to spreadsheets and databases that can be used to store and manipulate data, we certainly have much at our disposal.

While the main benefit of the Information Age is that we have an abundance of information at our disposal, the main drawback is that we have an abundance of information at our disposal. Almost 50 years ago, psychologists first noticed that with additional information came not only additional knowledge but also a significant amount of overconfidence. Renowned research psychologist Stuart Oskamp first noticed that in examining psychology cases, psychologists' confidence in their own decisions were magnified as they attained additional information. He noted that it didn't matter if the "task seemed strange or the case materials atypical"; the psychologist judging the case "became convinced of their own increasing understanding of the case."[4]

Later, economists Brad Barber of the University of California, Davis, and Terrance Odean of the University of California, Berkeley, would examine the characteristics, trading and performance of 1,607 investors between 1992 and 1995.[5] While this period of time was marked by a significant bull market in equities, the authors found that when traders moved to an online environment from a phone-based environment, their trading habits and performance changed dramatically. Not only did individuals trade more in an online environment, but their performance was subpar. Offering a reason for this divergence in performance, the authors noted that when traders took up the use of the Internet in earnest, they had "vast quantities of investment data; these data can foster an illusion of knowledge which increases overconfidence."

As analysts, we often stand on the edge of a knife. As we are dealing with a prognosis of the future; knowledge and experience contribute to a better understanding of the market and specific stocks, but it can also lead to cognitive biases. We almost always believe that the more knowledge we have, the better decisions we make. Overconfidence or narrow-minded thinking can commandeer one's logic. Once again, I don't think it can be said too many times: in investment decision making, we are forecasting the future—we are never dealing with true certainty. Thus, it is very easy to talk oneself into the new paradigm, or the "story" attached to the successful common stock.

I would go even further and note that sector and industry specialization fosters illusions of knowledge and general overconfidence, as industry analysts become noted "experts" in the press and when dealing with a firm's clients. While there are certainly benefits to having a deep knowledge of an industry, such knowledge can turn detrimental if it obscures the true weight of economic forces, such as the emergence of alternatives or the natural tendency for margins to contract. While firms within a sector can be different, firms that are not in the same sector or industry can be similar. From a valuation perspective, New York University's Aswath Damodaran sums up the question of comparability quite nicely: "A comparable firm is one with cash flows, growth potential and risk similar to the firm being valued. . . . Nowhere in this definition is there a component that relates to the industry or sector to which a firm belongs."[6] With this in mind, it may be more useful to read industry research from "experts" but maintain a more generalist approach as it pertains to stock research from a process standpoint. As a research generalist, what one sacrifices in terms of industry specific knowledge; one more than makes up for in gaining a broader perspective on a company's true investment merits.

In a related manner, visiting company headquarters, visiting key company properties and meeting with management can be extraordinarily persuasive. Not only do we have, in these instances, first-person accounts of the company's properties and personnel, but we have the attendant behavioral errors that necessarily come with such visits. Management, always persuasive (they didn't get to be in their current positions by being awkward), become representative of the company. Alternatively, properties become representative of the company. Wynn Resorts, Limited, has some of the most luxurious resorts in the world, but its stock should not be viewed through the prism of these beautiful edifices. The stock should be viewed through the prism of margins, long-term earnings growth potential, and underlying valuation. While one may not be consciously concluding that the management of a company is representative of the company, such beliefs are likely seeping into one's analysis in some fashion.

Attendant to company and management visits comes the endowment effect, one of the more irritating and difficult behavioral flaws that we are endowed with (no pun intended). Indeed, for the practitioner, who engages in fundamental analysis, the investment in a common stock involves an awful lot of commitment: research time, research debate, investment of actual funds, and the opportunity cost that an investment entails. Sometimes, such research will involve listening to company conference calls, and sometimes such research will entail traveling to the company or various operating sites. It might also entail talking to customers, and talking to suppliers and talking

to other research analysts who cover the security. At the end of the day, it is very difficult to escape the fact that our investment in a common stock is more than the investment dollars used to purchase the security. Whether we purchase the company or not, it often is the case that we are already endowed with it. It becomes difficult to step back objectively and say no to something that you've worked so hard on. This behavioral error is amplified by specific industry knowledge, travel to company locations and contact with management.

But, as noted in Chapter 7, my views here don't necessarily correspond to the conventional view of investment research. The conventional view of investment research would encourage company site visits and ample time traveling to various company locations and meeting with company management. The conventional view would argue that these are the practices that separate amateur investors from professional investors. Given my discussion of market efficiency and the large-cap universe, hopefully it's clear that such practices are unproductive and at odds with the opportunity set.

## Conclusions

In this chapter, I've discussed what I term the *front* of the investment process. These are issues that are precursors to decision making but are nonetheless important. It all comes back to the opportunity set. We are dealing with an opportunity set that is very liquid, very well researched, and constantly in the news cycle. Large-cap stocks have the widest appeal of any subset of equities in the market. Their importance to investors cannot be overstated, but with this importance comes constant evaluation and analysis. Again, to believe that one can gain an informational edge in the analysis of large-cap stocks is unreasonable. In this very liquid and researched market, one is better served by focusing their research efforts on methods that *control for* behavior and *focus on* behavior.

In order to control for behavior, quantitative methods can be a very useful tool that winnows a larger universe down to a more manageable subset of potential purchased candidates. By using disciplined methods to identify cheap stocks, one removes emotion from one's process, and as a consequence controls for errors that may inhibit one's decision making. To this end, screening a database for simple valuation measures such as P/B will lead one in the correct direction. However, it will always be the case that one is summarily dismissing a wide array of stocks and investment opportunities. Relative valuation metrics that are augmented with companion variables are

an intellectually reasonable way to account for a wide array of potentially undervalued stocks—including those that may merit higher valuations, given their growth or return prospects.

However, while quantitative methods work as a very good starting point in a disciplined process, they should not be viewed as an endpoint. Significant analysis needs to be completed for each portfolio candidate. Part of this process should be focused on the identification of errors that the investing community at large is making as part of their deliberations or pricing. Sometimes, these errors affect specific companies, while at other times they affect whole industries or the broad market. A subjective assessment of the market's mood is helpful in generating investment ideas, but also in augmenting a quantitative filtering routine. Certain industries and sectors may be affected by an inordinate amount of optimism or an inordinate amount of pessimism, so being attuned to overly pessimistic moods can result in portfolio ideas that warrant additional research. However, always keep in mind that top-down views of the investment climate are never a substitute for fundamental research and intrinsic value computations.

Still, having a more nuanced perspective of the market environment and being attuned to overly optimistic hyperbole or overly pessimistic exaggeration can aid one in assessing the growth prospects for a company and estimating various subjective inputs that underpin investment valuation. While this chapter has been focused on starting points in our search for opportunities, our understanding of the tenor of the investing climate will be useful as we move forward. In Chapter 9, I'll focus on approaches that seek to limit the effects of behavioral biases, and take advantage of the errors of others. While this chapter has focused on identifying opportunities, we'll now turn our attention to determining if the opportunities that we've identified are truly undervalued, or are simply reflecting poor underlying fundamentals.

## Notes

1. Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* (New York: John Wiley & Sons, 2002), 514–515.
2. Warren E. Buffett, *1992 Letter to the Shareholders of Berkshire Hathaway Inc.,* March 1, 1993.
3. In an interesting study of what causes unrealistic optimism and pessimism, Kruger and Burrus found that there is a bias that is "born of the egocentric tendency to focus on one's own rather than the average person's likelihood of experiencing the event." This is very much akin to the frequently done experiment whereby a room full of individuals is asked to determine whether they,

as an individual, are smarter than the average person in the room. Can you think of a circumstance in which you would say no? Are we ever inclined to say no to this question? Yet, obviously half the room is smarter than the average individual in the room, while half the room is less smart than the average individual in the room. Justin Kruger and Jeremy Burrus, "Egocentrism and Focalism in Unrealistic Optimism (and Pessimism)," *Journal of Experimental Social Psychology* 40 (2004): 338.

4. Stuart Oskamp, "Overconfidence in Case-Study Judgments," *Journal of Consulting Psychology* 29 (1965): 264.
5. Brad M. Barber and Terrance Odean, "Online Investors: Do the Slow Die First?" *Review of Financial Studies* 15(2) (2002): 481.
6. Damodaran, 462.

*The Large-Cap Portfolio: Value Investing and the Hidden Opportunity in Big Company Stocks*
by Thomas Villalta


CHAPTER 9

# Approaching Growth in Large-Cap Stock Research

As I argued in Chapter 7, managers fail to beat market benchmarks because, ironically, they approach the stock market from the perspective of market efficiency theorists. They follow the constructs of the efficient markets hypothesis (EMH), striving to prove it wrong, as they seek to prove that technical analysis adds value or smart determined analysts can uncover information that others can't uncover. But, as discussed in prior chapters, the EMH and theories of market efficiency do not fall apart because they aren't logical, or because they don't represent an ideal. They fall apart because of people's behavior. They fall apart because people don't behave in a manner that reflects many of the precepts that underpin theories of market efficiency.

The edge that the successful large-cap stock analyst has in their analysis comes from an understanding of why humans make poor decisions. Our edge comes from understanding the baggage that we bring to our analysis in the form of mental shortcuts and behavioral heuristics. We are then able to take this understanding and make a more objective assessment of a company's prospects. Often, this means coming to conclusions that are not supported by the recent past and contradict the consensus estimates.

This chapter is principally about growth, the growth in an individual company's earnings or cash flow. The growth rate that we use for near-term earnings and cash flow estimates is the foundation on which we value a company. Near-term growth, in this context, is not the next quarter or year, but the three- to five-year periods that seem within our grasp to figure out.

Effective portfolio management and stock selection is a delicate balancing act that requires a willingness to delve deeply into why the world works in the manner it does, but also an understanding of how the world should work. Creating a valuation model is but a small part of the puzzle. Indeed, I tell students that basic finance calculations are the least of their worries. Finance calculations are the easy part. It's the underlying assumptions that are difficult. Analysts appear very well versed in finance calculations and generally are very adept at delving into and understanding an industry or sector. However, a deep knowledge base in a given stock or industry often will mask the precarious competitive position of high-margin, high-return large-cap companies. To this end, this chapter will work to give the analyst a second and third perspective on which to base decision making. These two perspectives, an economic perspective and a psychological perspective, will aid the professional or amateur analyst in making decisions that are more objective.

As I proceed through this chapter, I'll attempt to work these perspectives into an examination of what I consider the greatest driver of intrinsic value computations, the abnormal, short-term growth rates we ascribe to a given company. I'll start by examining the broader investment community's track record at predicting growth, which gives us a clue as to the reasons why growth forecasts play a role in professional manager's underperformance of broad market benchmarks. Next, I'll turn my attention to breaking down the reasons why growth rates play such a disproportionate role in valuation. To this end, I'll first examine the basics of valuation, from a computational standpoint, and then turn to natural limitations to growth rates we can use in any valuation model. I'll also examine the effects of abnormal growth rates and abnormal growth duration on the underlying proportion of valuation that's derived from a very simple perpetuity. Next, I'll examine traditional approaches to estimating growth rates and how these estimates can be perverted by behavioral biases, rendering our assessment of the future skewed. As part of this examination, I'll look at estimates for Cisco Systems, Inc. in the late 1990s, and Apple Inc. today. Next, I'll offer a refresher on microeconomics with examples that place theory into the context of real market dynamics. I'll then end the chapter with some considerations pertaining to estimating short-term growth as well as some thoughts on how to more generally approach this very difficult task.

While throughout this chapter I point to a greater understanding of the ideals we find in microeconomics, the errors we make are largely behaviorally motivated. While the structural impediments discussed in Chapter 7 are likely more relevant to small-cap stocks, micro-cap stocks, and stocks in newer markets, the errors we find as a result of behavioral biases are pervasive—they

don't recognize company size. Unfortunately, we are not immune to the behavioral biases that create opportunities, so our main impediment to identifying opportunities that emanate from irrational market participants is an innate tendency to join this group of irrational actors.

However, the focus of traditional stock research is not geared toward avoiding this innate tendency and has been shaped by a misguided belief that it is the structural inefficiencies that we should search for and identify. This misguided notion feeds proponents of efficient market beliefs, as they are savvy enough to realize that one is unlikely to uncover information on large-cap issues that will surprise other analysts. To this end, as was explained in Chapter 7, the emphasis on being a *better* analyst and doing *better* research is misguided. One does not develop a better model. One does not find out more about IBM than another analyst. One does not *see into the future* with more clarity than another. But what one can do is understand what our failings are as investors and living animals. One can attempt to establish heuristics and other processes that counteract some of these failings and in doing so identify areas to avoid and areas to invest in.

At the end of the day, stock investing is about the future. It's about being able to arrive at a better estimate of the future than one's counterpart in the investing universe and then allowing market efficiency to move prices to one's estimate of intrinsic value as time goes by. In short, the process that I'm speaking of is not one where we've found a better crystal ball, its one where we've found the same crystal ball that everyone else is using, but we are more deliberately skeptical of what we see.

## Are We Good at Predicting Growth?

Before I delve into common stock valuation and the assumptions that underlie our models of intrinsic value, it's important to delve deeper into the broader investment community's failure to outperform large-cap benchmarks like the Standard & Poor's (S&P) 500 Index. While there is no singular reason for this failure, as one might guess, I believe that our estimates of growth play an oversized role. I'll discuss this role in greater detail as this chapter progresses, but let's first look at the broader research community's track record at predicting growth.

In short, the evidence appears to suggest that we are not very good at predicting growth. James Montier has done a significant amount of work examining this issue and presents fairly compelling evidence that we are not very good at predictions of the future. The predictions that we make appear to be biased by a severe degree of either overoptimism or overpessimism.

Looking at 17 years of data on earnings growth expectations and ensuing stock returns, Mr. Montier identifies some counterintuitive trends in the usefulness of analysts' predictions.[1]

Using MSCI indices as his universe, Mr. Montier ranked stocks from high to low, based upon EPS growth forecasts and then by actual earnings growth over the ensuing 12-month period. Each ranking was grouped into quintiles, which represented portfolios that were then examined on the basis of market outperformance or market underperformance. Table 9.1 summarizes this information.

In examining Table 9.1, note that portfolio 5-5, with a return that falls short of the market by 0.6 percent, represents a portfolio containing stocks that not only fell within the lowest quintile of earnings per share (EPS) growth expectations, but also had the lowest ensuing 12-month earnings growth, following the forecast. Thus, examining the rows of this table, analysts had low expectations for group 5 and higher expectations for group 1. Interestingly, the averages for these rows indicate that where analysts had low expectations, the average market relative returns for these stocks were significantly higher than those stocks with high expectations. Not surprisingly, those stocks with the lowest EPS growth expectations and the highest actual earnings growth over the ensuing 12 month period performed best, while those with relatively high forecasted EPS growth rates, but low earnings growth fared worst. Most interestingly, those stocks with high actual 12-month earnings growth and high expected growth (1-1 in Table 9.1) underperformed all low expectation groups, with the exception of the first (5-5 in Table 9.1).

**TABLE 9.1** Global, Total Returns Relative to Market Percentage (1988–2004)

| | | | Actual Earnings Growth | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Low | | | | High | |
| | | | 5 | 4 | 3 | 2 | 1 | Average |
| EPS Growth Forecast | Low | 5 | –0.6 | 3.5 | 6.4 | 3.7 | 10.8 | 4.8 |
| | | 4 | –8.3 | –2.1 | 2.7 | 9.2 | 16.9 | 3.2 |
| | | 3 | –12.3 | –4.7 | –1.5 | 4.0 | 5.8 | –1.8 |
| | | 2 | –9.8 | –11.4 | –5.9 | 1.6 | 4.9 | –4.1 |
| | High | 1 | –11.7 | 2.3 | –3.6 | –4.5 | 2.6 | –2.5 |
| | Average | | –8.8 | –2.5 | –0.4 | 2.8 | 8.2 | |

*Source:* James Montier, *Behavioral Investing: A Practitioner's Guide to Applying Behavioral Finance*. Chichester, England: John Wiley & Sons, 2007), 315.

What does this tell us? It tells us that growth matters in the context of valuation, but it reinforces that overpessimism likely leads to investment opportunities, while overoptimism has no reward. The expected EPS growth rate forecasts, and any overoptimism and overpessimism *baked* into these forecasts, are factored into pricing to a significant degree. However, while it would be tempting to say that the market quickly adapts to the understanding that a company is performing poorly or well, the truth is that analysts are, in a lagged fashion, just following a trend. As Montier has remarked in other analysis he's conducted on the usefulness of analyst forecasts, "analysts are very good at telling us what has just happened but of little use in telling us what is going to happen in the future."[2] That the two highest quintiles of the EPS growth forecast groupings have the lowest returns likely reflects overly optimistic growth expectations that followed a trend that had been established by recent performance. At some point, however, the trend oversteps reality, and the result is underperformance.

In short, our inability to accurately forecast growth does not stem from ignorance or a lack of diligence. It is symptomatic of behavioral flaws that lead us to error on both sides of overreaction—overoptimism and overpessimism. With this in mind, let's now examine the role of growth expectations in the context of intrinsic value computations. Understanding the role growth plays provides a broader understanding of how to structure one's investment process and offers clues as to how to approach this important input.

## Equity Valuation Basics

First, it's important to distinguish between the model and the inputs. While there are countless problems with modern finance theory, the errors made in valuation are not due to a theoretical or logical problem with how we model a common stock's intrinsic value. The model that is used for valuation purposes—principally, that the value of the common stock equity in a company is the sum of its discounted cash flows—is sound. It makes intuitive sense, and, theoretically, it incorporates what is important for assessing a company—namely, will this company pay you back in some fashion, or have the capacity to pay you back in some fashion?

John Burr Williams first discussed discounted cash flow analysis in his book *The Theory of Investment Value*,[3] published in the late 1930s. Since then there have been a number of variations on this idea, but all of them take a similar form. Generally, there is an abnormal growth period, followed by a stable-growth perpetuity. The model shown in formula 9.1, as an example, starts

with five years of abnormal growth, followed by stable growth. Each abnormal growth period cash flow ($CF_t$, where t = 1 to 5) is discounted at a rate that corresponds to the discount period ($k_t$, where t = 1 to 5), in essence telling us the value today of each abnormal cash flow in the future. When the abnormal growth period ends, the stable growth period begins. This stable growth period is valued as a perpetuity. In the perpetuity, we use a starting cash flow ($CF_T$). This cash flow is at the starting point of when growth slows from the abnormal growth period (in the model below this would be period t = 6). This begins a period of limited growth, where growth is subject to constraints that will be described later in this chapter. This cash flow ($CF_T$) is divided by the steady-state discount rate ($k_T$) less the long-term, steady-state, stable growth rate (g), with the resulting "terminal value" discounted back to the present using the discount rate used in the preceding period (in this case of five years of abnormal growth, $k_5$). The formula (9.1), shown for a model with five years of abnormal growth, is provided below as an example.

$$\text{Value} = \underbrace{\frac{CF_1}{(1+k_1)^1} + \frac{CF_2}{(1+k_2)^2} + \frac{CF_3}{(1+k_3)^3} + \frac{CF_4}{(1+k_4)^4} + \frac{CF_5}{(1+k_5)^5}}_{\text{Abnormal (High Growth) Period Cash Flows}} + \underbrace{\frac{\frac{CF_T}{(k_T - g)}}{(1+k_5)^5}}_{\text{Stable Growth Period Cash Flows}} \qquad 9.1$$

The first five parts to this model are generally called the abnormal growth, or "high growth period," while the last part of this function, $CF_T/(K_T - g)$, is termed the *terminal value.* The terminal value covers the company's years after the high growth period—in essence, it has an infinite time horizon.

If we substitute interest rate payments for $CF_t$, and the final principal payment for $CF_T/(K_T - g)$, we would get the value of a bond. $CF_T/(K_T - g)$ is a perpetuity that represents a steady-state period that begins in the future (although it could just as simply begin next year). An important element to this model is that g, the steady-state growth rate, cannot exceed the discount rate in the steady-state period. Moreover, through the inverse relationship that the growth rate has with the steady state cash flow at time "T," a small movement in g can have a huge impact on our overall valuation.

Cash flow at each abnormal growth period "t" ($CF_t$) in our model in formula 9.1, can be considered in a couple of forms. It could be free cash flow

to the firm (free cash flow plus interest expense), or just cash flow to equity holders (free cash flow). Cash flow ($CF_t$) in any given period may be presumed to be growing at a linear rate in the abnormal growth period, or it may reflect a different growth trajectory. Moreover, often it is presumed that growth (for the abnormal growth periods, reflected in $CF_t$) drops in a linear fashion from the peak of abnormal growth to the expected steady-state, stable growth rate (g). Growth for the abnormal growth period, reflected in each cash flow at time "t" ($CF_t$), will differ for each firm, depending on the firm's prospects and competitive position. While cash flow to the firm would be discounted at the weighted average cost of capital, the cash flow to equity holders would be discounted using equity discount rates. Also, the model above reflects a valuation for the equity in a company. We could value the entire firm, and back out debt and per-share value, or we could value per-share amounts.

This book is not mainly about the mechanics of valuation, and for a more encompassing discussion of valuation, I would refer the reader to two excellent books on this subject: Aswath Damodaran's *Investment Valuation*[4] and *Investment Analysis & Portfolio Management* by Frank Reilly and Keith Brown.[5] This book is principally about the inputs, about how we view inputs, and how we approach valuation generally. The calculations don't change, but how one considers certain inputs will hopefully become more objective.

Importantly, much of the value that we see in a company—its intrinsic value—is captured by the discounted terminal value. It is not difficult to see that this part of the function is fraught with significant uncertainty. We, as analysts, have difficulty forecasting three to five years out, yet the majority of the value represented in a common stock's price is attached to a perpetuity that is of infinite length.

Still, there is really no way around this tendency. We can suppose that our company in question is not a going concern after a certain period, but generally these are not the companies that we will find attractive to begin with. Indeed, it would be a very rare case where the resulting valuation would look attractive for a concern that we believe is of finite life, given the proportion of valuation represented by the terminal value.

Much of valuation is simplified by certain conventions that we have little control over, or that we may not have an inclination to vary. For example, discount rates are built on estimates of the risk-free rate for certain periods, with an additional amount added to account for the risk specific to a company. Generally, we use the capital asset pricing model (CAPM) or an arbitrage pricing model to give us a relative sense of what this additional risk is. As noted in Chapter 2, beta ($\beta$), in the CAPM, tells us the degree to which a company varies with the market.[6] There are many problems with the CAPM, not the least of which is the fact that it presumes that markets are efficient.

As I've discussed previously, the market is not efficient over the short term (the term that counts!), but is likely efficient over the long term. In calculating the intrinsic value in a common stock, we are looking for an ideal. We are looking for that ideal value that the price should converge upon in the future, so using the CAPM or a different arbitrage model is useful in calculating the ideal that will serve as the basis for price targets.

## Limitations to Estimating Long-Term Growth Rates

Estimating growth rates or abnormal growth period cash flows are arguably the most important and most difficult aspect to valuation. There could conceivably be an infinite number of growth rates used in valuation, but in truth we are most concerned with two periods: short-term abnormal growth rates and long-term, terminal value growth rates.

Long-term growth rates are relatively easy to calculate. Given that we are dealing with a perpetuity, there are limitations to growth. If we have a company that is largely focused or confined to the United States, and our long-term growth rate exceeds the growth rate of the U.S. economy, then our company would presumably become larger than the U.S. economy at some point in the future. Obviously, this is not possible for a variety of reasons. The growth rate that one utilizes here should be limited to the growth rate for the region in which the company operates. In other words, if our company operates only in the United States, the company's long-term growth rate, g, will be limited to the long-term growth in the U.S. economy.

Importantly, one shouldn't substitute a higher long-term growth rate into one's valuation model in order to sidestep a longer abnormal growth period. As noted in the last section, the perpetuity within any valuation model is going to be very sensitive to the long-term growth rate—especially as this rate starts to approach the long-term discount rate ($k_T$). If one is uncomfortable with a longer growth duration period, as one should be, then maybe the stock in question is one best avoided.

## Abnormal Growth Magnitude and Abnormal Growth Duration

While the growth rate used within a terminal value is less flexible than other assumptions used in our valuation model, the cash flow that becomes the basis for our steady-state period (and thus the basis for our discounted terminal

value) is very important in driving underlying valuation. Traditionally, the cash flow at time "T" is built on cash flow growth spanning several years of abnormal growth. Thus, while it would seem that much of our terminal value is subject to the limitations cited earlier, it is very much influenced by the abnormal growth period. I would argue that our near-term growth rates are the most important assessment that an analyst will make. However, this is not because the free cash flow generated by such growth rates will add to valuation, but rather due to the fact that our terminal value is very much influenced by these near-term growth rates. Even if our terminal value is based on relatively conservative assumptions, the cash flow that we start this value with disproportionately affects the underlying valuation. We can see this in some simple models of intrinsic value, so let's revisit our original discounted cash flow model described at the start of the chapter (9.1).

$$\text{Value} = \overbrace{\underbrace{\frac{CF_1}{(1+k_1)^1} + \frac{CF_2}{(1+k_2)^2} + \frac{CF_3}{(1+k_3)^3} + \frac{CF_4}{(1+k_4)^4} + \frac{CF_5}{(1+k_5)^5}}_{\text{Sum of Discounted High-Growth Period Cash Flows}}}^{\text{Traditionally, cash flows "CF}_1\text{" to "CF}_5\text{" have reflected a momentum that may or may not reflect a continuing dynamic for even a high-growth company.}} + \overbrace{\underbrace{\frac{\frac{CF_T}{(k_t - g)}}{(1+k_5)^5}}_{\text{Discounted Terminal Value (perpetuity)}}}^{\text{The terminal value is largely influenced by "CF}_T\text{"—which is traditionally built off of "CF}_1\text{" to "CF}_5\text{".}} \qquad 9.1$$

The model above would be consistent with a five-year abnormal growth period. If we were to consider a two-year abnormal growth period, our model, using the same definitions would look as follows, in 9.2.

$$\text{Value} = \underbrace{\frac{CF_1}{(1+k_1)^1} + \frac{CF_2}{(1+k_2)^2}}_{\text{Sum of Discounted High-Growth Period Cash Flows}} + \underbrace{\frac{\frac{CF_T}{(k_T - g)}}{(1+k_2)^2}}_{\text{Discounted Terminal Value (perpetuity)}} \qquad 9.2$$

In each of the two models, the calculations of $CF_t$ are thought to be independently calculated. However, we could also use a compounded annual growth rate to arrive at a similar value. Using an abnormal

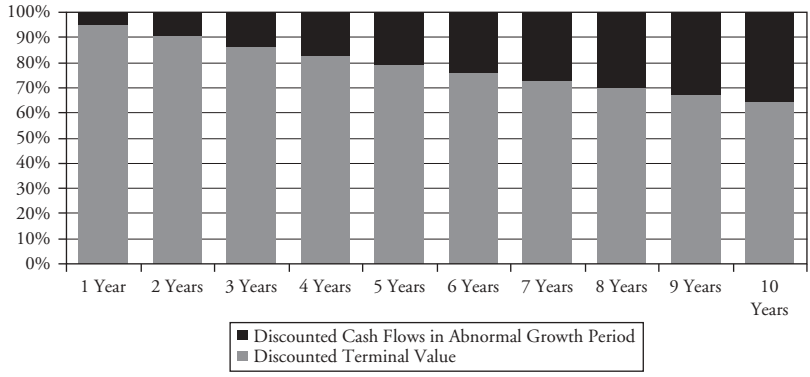
compounded annual growth rate ($g_A$) for calculating each of our abnormal growth period cash flows, we arrive at our cash flow estimates ($CF_t$ and $CF_T$) for each period (t) as follows:

$$CF_1 = CF_0 \times (1 + g_A)^1$$
$$CF_2 = CF_0 \times (1 + g_A)^2$$
$$CF_3 = CF_0 \times (1 + g_A)^3$$
$$CF_4 = CF_0 \times (1 + g_A)^4$$
$$CF_5 = CF_0 \times (1 + g_A)^5$$
$$CF_T = CF_0 \times (1 + g_A)^5 \times (1 + g), \text{ where g remains our steady-state, stable growth rate.}$$

Using a compounded annual growth rate in order to arrive at both abnormal growth period cash flows and the starting stable growth period cash flow ($CF_T$), allows us to look at a variety of scenarios using different growth rates and different growth durations. One will find that I prefer to use compounded annual growth rates, whether or not they reflect the true trajectory of cash flows for a given company. If one expects that abnormal cash flows will not follow a linear trajectory, one could just as easily back into a compounded annual growth rate. What one loses in the way of precision, with regard to near-term abnormal cash flows, one more than makes up for in the insights gained from having a flexible valuation model. As I move forward with the following examples, and into matrixes that examine the effects of various abnormal growth rates and growth durations, one will find that we are afforded a unique view on market value. We are able to consider a company's near-term growth prospects in a manner that allows us to also get a sense of the market's implied growth expectation. Hopefully, this will become clear as the chapter progresses.

Constructing various models, using different abnormal growth periods (from 1 year to 10 years), we can see how the length of our abnormal growth period affects the proportion of our value attributed to the terminal value. In Figure 9.1, I created a relatively simplistic model of a free cash flow positive firm, with an upward sloping set of discount rates, based on a beta statistic of 1.0. In the first simplistic case, examining a near-term growth rate of 8 percent, with a stable growth rate of 3.5 percent, we can see that as we vary the short-term growth period—from 1 year to 10 years, there appears to be a linear relationship between the proportion of my underlying value ascribed to the short-term cash flows (discounted to the present) and the proportion of my underlying value ascribed to the terminal value (again, discounted to the present).

**FIGURE 9.1** Proportion of Total Intrinsic Value Attributed to Abnormal Growth Cash Flows and the Terminal Value—8 Percent Abnormal Growth Rate




To understand Figure 9.1, consider that if we have a five-year abnormal growth period, with 8 percent growth, and then the company settles into a long-term, stable-growth perpetuity with a rate of 3.5 percent, then for our underlying intrinsic value, 79.22 percent of this intrinsic value is resulting from free cash flow in the stable growth period, while only 20.78 percent of this intrinsic value is resulting from the cash flows generated from the abnormal growth period (five years' worth in this case). Alternatively, if we have a 10-year abnormal growth period, with 8 percent growth per annum, and then the company settles into a long-term, stable growth perpetuity with a rate of 3.5 percent, then for our underlying intrinsic value, 64.37 percent of this intrinsic value is resulting from free cash flow in the stable growth period, while 35.63 percent of this intrinsic value is resulting from the cash flows generated from the abnormal growth period (10 years' worth in this case). Intuitively, this makes sense, as we have shifted some of the cash flows from the stable growth period to the abnormal growth period. The more years we add on to the abnormal growth period, the greater the proportion of the underlying valuation will accrue to the abnormal growth period. Still, I think the larger take-away is that at the end of the day, even after 10 years of abnormal growth, more than 50 percent of the intrinsic value is well into the future. Even with a growth rate of 3.5 percent—in other words, the abnormal growth rate equals the stable state growth rate (no abnormal growth period)—the proportion of value accruing to the terminal value remains above 50 percent. In this scenario (not represented with a figure here), the bulk of the underlying intrinsic value still falls to years that fall very far into the future. Any discounted abnormal growth

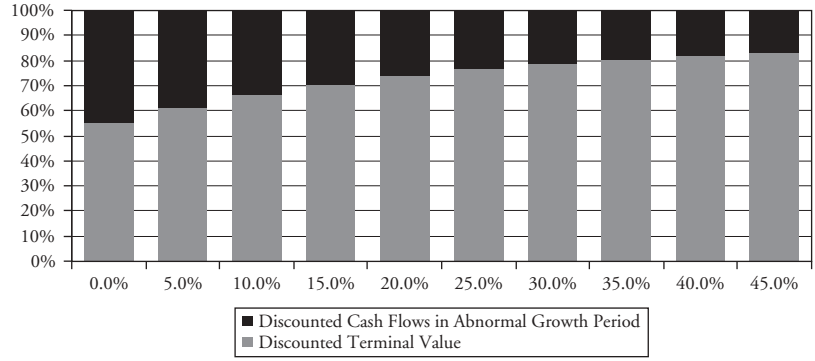
cash flows, under these assumptions, simply pull value from what would instead fall into the terminal value—showing an even greater degree of linearity than was seen in the example using 8 percent above.

More importantly, the greater the abnormal growth rate the more we push value into the terminal value. We can look at this by examining a single growth duration period, and then varying the abnormal growth rate. If we keep the abnormal growth period stable, at 10 years, and then vary the abnormal growth rate, we can see the effect that the abnormal growth rate has on the proportion of our underlying intrinsic value accruing to the discounted terminal value, as shown in Figure 9.2.

As Figure 9.2 shows, the higher the abnormal growth rate, holding the abnormal growth period constant (as well as all other attributes to this model), the greater the proportion of underlying intrinsic value that accrues to the discounted terminal value.

This is significant. It is difficult enough to estimate cash flows into the future. It is risky enough to estimate high rates of growth into the future. However, even if we settle into a slower growth period at some point, as Figure 9.2 illustrates, we set up our valuation to be very reliant on the uncertainties attached to the perpetuity. Our reliance on a perpetuity isn't necessarily bad if the cash flow in the perpetuity was based on relatively reasonable growth or even slower, more staid growth. But as the terminal value takes on a much bigger role with higher growth rates, there is a likelihood that some of our assumptions may prove to not hold true—especially when they're built on the high-growth-period cash flows. What are these assumptions? Companies experiencing high growth typically have a number of advantages:

**FIGURE 9.2** Proportion of Total Intrinsic Value Attributed to Abnormal Growth Cash Flows and the Terminal Value—10 Years of Abnormal Growth



- Less direct competition
- Fewer substitute goods
- Higher gross and operating margins
- More market share and momentum

All of these advantages change as the company evolves, morphing from a high-growth enterprise to a more stable growth enterprise. Or the market changes, and more substitutes and competition change the underlying market dynamics.

Intuitive or not, the larger issue, as the terminal value suggests, is that the cash flow at time "T" drives a large part of our underlying valuation. Short-term growth, in the context of establishing the baseline for this cash flow at time "T" is very important in any common stock evaluation. While some may argue that we focus too much on the short term, the short term (and in this case I'm talking years and not quarters) is really a three- to five-year period that we evaluate in order to account for a "high-growth" period.

Can we go out longer than five years? Sure, one could go out 10 or 15 years, and, indeed, some analysts have had to do such when justifying lofty valuations for high-growth companies. However, it's difficult to predict what will happen three years from now and five years from now. How much credence can one give to an eight-year projection or a 10-year projection?

Moreover, as was explained in Chapter 8, there's a trade-off between the knowledge required of a particular company or industry as it pertains to long-term forecasts (expertise) and the accuracy of such forecasts. While expertise with regard to a company or industry is seemingly beneficial, the truth is that the more that we insulate ourselves from other parts of the market or world, the more likely we are to be both overconfident and biased in our assessment of a firm's prospects. Part of this, in my view, emanates from the perceived scientific nature of stock analysis or financial analysis in general and part is the "illusion of knowledge" discussed in Chapter 8. In spite of an abundance of resources and a clear focus on the task at hand, studies have shown that professionals continually overestimate their own abilities.[7]

And, unfortunately, as was discussed in Chapter 8, many investment management organizations and Wall Street research departments are shaped to dive deeply into companies and industries, giving analysts a sufficient amount of knowledge to be overconfident in their abilities. The problems that we see in common stock pricing are not due primarily to a lack of information or poor synthesis of the multitude of factors that go into ascertaining a stock's intrinsic value (although given the non-Bayesian nature with which we approach the assessment of likelihood, there is surely some of this evident

as well), but to weaknesses we have in our decision-making processes. Yet, as Montier notes, most investors (and I would add professional or otherwise) approach research with the belief that "they need to know more than everyone else in order to outperform the market."[8]

Once again, I would point to the thrust of one's effort and one's emphasis when it comes to research. What are we trying to achieve, and what are we capable of achieving? Doing the mechanical computations required within a model of a given company's free cash flow or its underlying value is fairly simple, and will grant no individual (again, professional or otherwise) an edge in their analysis. Self-control is what is paramount. It's not principally one's knowledge or level of intelligence, although those are certainly base lines. It's the ability to step back and say, "Yes, I've got a deep knowledge of this company and its industry, but making a 10-year abnormal growth projection is so fraught with uncertainty that it would provide little value to anyone who is looking to make a reasonable assessment of the investment merits of the company." In short, the fact that one can make a long-term forecast doesn't mean they should. This is the element of self-control that is not related to intelligence but more to one's confidence (or overconfidence). To this end, I'm reminded of one of my favorite quotes from Robert Shiller in a "Perspective" that he wrote for the *Financial Analysts Journal* some time ago: "It is not the error of fools. It is more the error that afflicts some of Shakespeare's tragic figures—in the sense of having subtle weaknesses or a partial blindness to reality."[9] And, indeed, it has always been a bit paradoxical that so many smart individuals work on "Wall Street," and yet the performance of investment managers as a whole appears so lacking.

## Traditional Methods for Determining Growth

So, given the outsized effect that short-term growth has on our underlying valuation, how do we reasonably assess a company's prospects? What do we have to work with? Well, the starting place is past performance and the potential market opportunity. Often, analysts will consider the company in two discrete, or semidiscrete, groupings of assets. The company owns assets that generate cash flows for the firm—this is one group of assets. The second group are assets that will be purchased in the future to generate additional cash flows, sometimes referred to as *growth assets*. This is an important distinction, as the reinvestment of capital in the business is part of a fundamental estimation of growth. Indeed, as Damodaran notes, the "soundest way of incorporating growth into value is to make it endogenous (i.e., to make it a

function of how much a firm reinvests for future growth and the quality of its reinvestment)."[10] With this in mind, we consider the two components that go into assessing growth:

1. The returns that a company gets on its current base of assets.
2. The percentage of earnings that are reinvested in the business.

The company makes a return on its base of assets. To equity holders, this base is shareholder's equity, oftentimes referred to as *book value.* The return from an accounting perspective is net income. So the return on shareholder's investment is net income divided by book value. This is commonly referred to as *return on equity* (ROE), as shown in formula 9.3:

$$\text{Return on Equity (ROE)}_t = \frac{\text{Net Income}_t}{\text{Book Value of Equity}_{t-1}} \qquad 9.3$$

Notice that it is the beginning base of assets that is used in determining the ROE, as these assets produced the return in the given year. So, the given year, t, provides a return on equity that is calculated using current-year earnings (t) and beginning-of-year book value of equity (t – 1).

This is the return that our asset base is currently providing, but does not account for a growth in value. For this, we need to turn our attention to what is reinvested in the business. Reinvestment is simply the portion of earnings that are not paid out to shareholders. This is commonly referred to as the retention ratio, as shown in formula 9.4:

$$\text{Retention Ratio}_t = 1 - \frac{\text{Dividends}_t}{\text{Net Income}_t} \qquad 9.4$$

Alternatively, one could add share repurchases to this figure, for a more accurate reflection of the company's payout (shown in formula 9.5):

$$\text{Modified Retention Ratio}_t = 1 - \frac{\text{Dividends}_t + \text{Share Repurchases}_t}{\text{Net Income}_t} \qquad 9.5$$

Note that often cash flow from operations is a better indicator of what the company has at their disposal in terms of retention for purposes of investment. In many cases, I will substitute cash flow from operations ($CFO_t$) for net $income_t$. In some cases, this will not make a material difference; in other cases, it's more reflective of the company's true retention rate.

If the company is growing through share-based acquisitions (not offset by share repurchases), then the company's growth may be significantly less than it seems, due to the accompanying dilution that comes from such strategies. Growth is meaningful to the common stock investor only when it results from reinvestment of earnings and accretive acquisitions, not through dilutive measures or debt issuance (although debt issuance may at times be prudent). In the end, dilutive measures will show up in ROE.

Using an average of historical modified retention ratios and an average of the firm's historical ROE, we can calculate an estimate of what I would term the *theoretical* growth rate for the company. This calculation is shown in formula 9.6:

$$\text{Theoretical Growth Rate} = \text{Average Modified Retention Ratio} \times \text{Average ROE} \qquad 9.6$$

As the market environment can have a pronounced effect on ROE, this rate can be fairly far from actual performance in any given year. The theoretical growth rate relies on the competitive environment remaining stable, the company's willingness to invest in growth initiatives (versus holding cash on its balance sheet), and a company's commitment to consistently rewarding shareholders through share repurchases and dividends. Intuitively, it is appealing, but as I will note later in this chapter, I don't rely singularly on this figure for estimation purposes. Growth is affected by not only the company's organic efforts (which are reflected in the theoretical growth rate), but also by acquisitions, divestitures, the economic environment, and the company's market environment.

Still, to the common stock investor, it matters little if the company holds the cash on its balance sheet or acquires other companies or invests it in growth initiatives . . . OK, it matters insofar as the cash should be put to good use. However, for purposes of evaluating a company, what matters most is a return on the capital invested. In short, we don't invest in companies to receive a beautiful stock certificate or to have the pleasure of telling friends and family that we are invested in said company. We invest in companies to get a return on our capital. Our alternative is always much safer investments such as bonds and government obligations. At the end of the day, we want something back. The most direct payment method is via dividends—a true return of cash to shareholders. However, share repurchases can be as appealing, as our pro-rata share of the company will rise with each share repurchased (and we won't have to pay taxes on the return of capital or income).

My point is that if the company is not returning cash in some manner (via dividends or share repurchases) then it is reinvesting the excess cash flow in the company. If some of this reinvestment is misguided, or invested in money market instruments, then it will show up in the ROE.

## Perversions of Growth Estimates in Large-Cap Stocks

As noted at the start of this chapter, the problems with stock valuation pertain less to the model that one is using and more to the inputs that fill in the model. It is in the inputs that we see behavioral biases and flaws steadily creep in and pervert an otherwise worthy process. Indeed, while it's tempting to say "garbage in, garbage out," this characterization is an oversimplification of the problem. Our starting point is always the acknowledgment that all of our information is made up! We have no choice: a stock's value is based on its future prospects. In general, one's inputs will be wrong—it's just a matter of how wrong.

Our failings in this regard mainly pertain to the aforementioned estimations of ROE or, more generally, the prospects for growth in near-term cash flow and earnings. Returns on equity are subject to a variety of factors that can distort underlying ability or the advantage that a given firm will have. For any firm, growth will be influenced by:

- The number of competitors in the market and the capacity of production in relation to demand.
- The size of the firm's current installed base in relation to the size of the market.
- The speed with which technology evolves in the market or substitute products materialize.
- Where we are in the economic cycle.

Notice that I've not enumerated a "Porter's Five Forces" framework or a SWOT (strengths, weaknesses, opportunities, and threats) analysis in discussing a company's growth prospects. While Porter's Five Forces, or a similar strategic analysis, is a useful tool in examining a company's near-term prospects and ability to compete, at the end of the day, if margins and returns on equity are high enough, there will be a competitor that breaks down the wall and is able to, at the very least, pressure margins. We do examine a company's prospects in a five forces framework, but the long-term nature of intrinsic value adds considerable weight to the criticisms[11] of these types

of frameworks. Sometimes, there will be a direct competitor, but other times, a substitute product will usurp the sales momentum of a fast-growing enterprise. Moreover, at the end of the day, a larger company will generally see sales and earnings slow, as the number of potential new customers declines (due to market saturation).

Also, it's important not to discount the effect that the economic or business cycle has on our perception of a firm's earning ability. While new markets may present significant growth opportunities, the underlying impression of a firm's growth may be as much skewed by an economic expansion or significant growth in certain economic attributes (such as personal income or business spending). These economic factors can seemingly supercharge earnings when they align with an already robust growth market. Similarly, we can see the opposite affect when we have companies that are mired in economic recession or an abnormally slow growth environment.

Given the myriad of inputs to determining short-term growth, some internal in nature and some exogenous in nature, the most effective manner in which to approach growth forecasts is to remove oneself, to a certain extent, from the forecasting business. By examining others' forecasts and the market's implied forecast from the perspective of both behavioral biases and traditional microeconomic theory, one can reflect on the likelihood of overoptimism or overpessimism. In this manner, the analyst, who must still research the company, the company's industry, and its' competitors, critiques others' work and the market's valuation. The analyst rearranges his approach to underlying value and is more focused on the likelihood of others being wrong.

Recall from Chapter 5 the data found in Table 5.1 for Cisco Systems, Inc. (CSCO). CSCO's performance in the 1990s was extraordinarily compelling. Returns on equity were clearly falling in the latter 1990s, and indeed, rates of growth in revenues and net income appeared to taper off in the latter years of the twentieth century as well. However, even in 1999, the growth in revenue eclipsed 40 percent and the growth in net income eclipsed 50 percent. It would be easy to look at CSCO's track record and assume that the company had at least a few years of stellar abnormal growth left in it. Add to this track record an intoxicating environment where new Internet-based ventures sprang forth in abundance and your next-door neighbors were making millions by doing what others had done, and we had a recipe for an inordinate amount of overoptimism.

Indeed, even well-respected Wall Street research organizations were enthusiastically touting the company's prospects. George Kelly, an analyst with Morgan Stanley Dean Witter, defended CSCO's sky-high earnings multiple by noting that a "low P/E usually signals investors are uncomfortable."[12] Mr. Kelly

went on to note that "Cisco has had a tremendous track record of continuous upside surprises. And Cisco is viewed as opening several new markets. . . ." Paul Weinstein of Credit Suisse First Boston was equally enthusiastic as he explained that "Cisco's stock has increased 1,000 times a perfect 100 percent annual return since it launched its IPO in 1990."[13] In addition, Michael Neiberg, a lead analyst with Chase Hambrecht & Quist, is credited with explaining, "If you had picked a price point to sell [high] at anytime in the past 10 years, you would have been wrong . . . they have such an impressive track record of growing. . . ."[14]

Notice, to start with, the behavioral biases inherent in the characterizations cited above. One, the past performance of the company's stock price had become representative of what we could expect in the future. Representativeness biases were very common cognitive errors that beset investors of all types at the end of the 1990s. A robust economic environment collided with a very hot technology industry and resulted in growth rates that were clearly not sustainable. Moreover, the *hot hand* fallacy, an error that relates to representative sequences, was clearly on display as well, as people had become conditioned to expect continued outperformance—and feared being proven "wrong."

However, in more practical terms, when we take our valuation model and "plug in" a growth rate for CSCO, we needed to go in one of two directions to justify the company's valuation in early 2000:

1. We apply an extraordinarily high growth rate to earnings for a three- to five-year period, and then settle into a stable growth rate that is lower than the discount rate, but likely higher than domestic gross national product (which is reasonable, given the global nature of CSCO's sales).
2. Make our abnormal growth period much longer, allowing us to use a smaller (but still high by any standards) growth rate that probably approached the ROE in the latter years of the 1990s.

In short, in order to justify the price of a high-growth company like CSCO in the late 1990s, it was a bit of a balancing act—we either use our crystal ball to see very far into the future, or we use our crystal ball to conjure up visions of growth that are quite optimistic by any stretch of the imagination. Neither case is very appealing to the value-oriented practitioner.

We can see some resulting figures, if we move in either direction by creating a matrix that examines these two elements, while holding other components of valuation constant. First, let me state that this is a very rough

valuation, meant mainly for didactic purposes. We'll presume that we are using information that was available at the end of September 1999. At that time, CSCO had released fiscal 1999 financial statements that reflected the period ending July 31, 1999. To start, let's begin by looking at the company's operating cash flow, capital expenditures, and free cash flow, as shown in Table 9.2.

Note that capital expenditures as a percentage of operating cash flow varied from year to year but averaged approximately 25 percent over the nine-year period (from 1991 to 1999). At the end of 1999, with just over 28 percent of operating cash flow being used for capital expenditures, we had a fairly good sense of a starting base of free cash flow, at $3.1 billion. Note that the growth in free cash flow was significantly higher than the company's return on equity. This likely reflected the stair-step nature of growth for a fast-growing enterprise. While the data in Table 9.2 would seem to support a very aggressive growth rate for free cash flow, we will find in an examination of the resulting free cash flow amounts in coming years, that growth rates that even exceed 35 percent appear somewhat egregious given the starting free cash flow amount of just over $3 billion. In short, in 1999, CSCO was no longer a small, fast-growing startup, but instead was a fairly sizable enterprise. Growing free cash flow from a starting base of $33 million is one thing, while growing it from a starting base of just over $3 billion is something quite different.

While CSCO was fairly acquisitive, its free cash flow per share growth was not too far off of its aggregate free cash flow growth. Looking at the four years preceding 1999, we get a sense of the difference between these two figures, as shown in Table 9.3.

If share-based acquisitions were driving growth in free cash flow by way of dilutive transactions, we would see this in a comparison between free cash flow growth and free cash flow per share growth. In an examination of the preceding four-year period (from 1995 to 1999), only in 1996 do we see a significant difference. Consequently, while I do believe there is a risk of dilution from share-based acquisitions for CSCO shareholders, such a strategy was not a driver of growth from year to year.

With this information as a starting point, our assumptions for analysis purposes were as follows:

- We will start with a fiscal 1999 free cash flow amount of $3.109 billion.
- In this analysis, we'll look at various abnormal growth periods that will run between 1 and 15 years—this is the column headings in the matrix I'm creating.

**TABLE 9.2** CSCO's Actual Operating Cash Flow, Capital Expenditures, Free Cash Flow, and Returns on Equity

| For the Year Ending at Month-End in July | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|---|---|---|
| Operating cash flow (OCF) | $44 | $126 | $176 | $328 | $443 | $1,063 | $1,448 | $2,865 | $4,325 |
| Capital expenditures[15] | $11 | $23 | $34 | $73 | $164 | $275 | $410 | $599 | $1,216 |
| Cap-ex, as a % of OCF: | 25.0% | 18.3% | 19.3% | 22.3% | 37.0% | 25.9% | 28.3% | 20.9% | 28.1% |
| Free cash flow | $33 | $103 | $142 | $255 | $279 | $788 | $1,038 | $2,266 | $3,109 |
| Free cash flow growth rate | N/A | 212.1% | 37.9% | 79.6% | 9.4% | 182.4% | 31.7% | 118.3% | 37.2% |
| Return on equity | 43.91% | 45.23% | 44.83% | 45.30% | 37.01% | 41.63% | 28.95% | 23.09% | 21.29% |

**TABLE 9.3** CSCO's Free Cash Flow Growth Rates, Free Cash Flow per Share Growth Rates, and Shares Outstanding

| For the Year Ending at Month-End in July | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|
| Free cash flow growth rate | 182% | 31.7% | 118.3% | 37.2% |
| Free cash flow per share | $0.13 | $0.17 | $0.36 | $0.48 |
| Free cash flow per share growth rate | 116.7% | 30.8% | 111.8% | 33.3% |
| Shares outstanding | 5,843 | 6,037 | 6,250 | 6,542 |

- The rows to my matrix will reflect various estimates for growth in cash flow from operations.
- Capital expenditures are expected to be accounted for in free cash flow, and shares are expected to remain constant. Intrinsic value is the value today for a given firm. As a consequence we use today's share count. Growth that comes from acquisitions is not included if the acquisitions are not part of the capital expenditures deducted from cash flow from operations.
- I'll use a 4 percent implied equity risk premium for calculating my discount rates and I'll presume that CSCO is riskier than the market, with a beta equal to 1.25.

Using these assumptions we can examine a range of per-share intrinsic values based on differing short-term growth rates and the duration of the abnormal growth period. CSCO's prices per share under various scenarios are shown in the matrix provided in Table 9.4. The companion web site for this book includes a spreadsheet that allows readers to calculate matrixes such as this.

Each value in Table 9.4 represents an intrinsic value computation that is derived from a formula that is consistent with a variation of formula 9.1. In the case of a one-year abnormal growth period, the formula consists of one abnormal cash flow discounted to the present and a perpetuity discounted to the present. In the case of a 15-year abnormal growth period, there are 15 cash flows that are discounted to the present, and then a perpetuity that is discounted back 15 years. As a consequence, this table is comprised of a multitude of calculations. Each of these calculations addresses a specific combination of abnormal growth magnitude (from 35 percent to 44 percent) and abnormal growth duration (from 1 year to 15 years). For example, the price of $8.50 presumes that CSCO will grow at 35 percent for 1 year, and then settle into a stable growth rate of 4 percent thereafter. At the other end of the spectrum, a price of $420.50 can be justified by presuming that CSCO will grow at a rate of 44 percent for 15 consecutive years, and then settle into

**TABLE 9.4** CSCO Estimated Per-Share Intrinsic Value in 1999 under Various Scenarios

| | Abnormal Growth Period in Years | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years | 6 Years | 7 Years | 8 Years | 9 Years | 10 Years | 11 Years | 12 Years | 13 Years | 14 Years | 15 Years |
| 35% | 8.5 | 10.9 | 13.8 | 17.3 | 21.6 | 26.6 | 32.7 | 40.5 | 49.9 | 61.5 | 75.4 | 92.3 | 112.9 | 138.0 | 168.5 |
| 36% | 8.6 | 11.0 | 14.1 | 17.8 | 22.3 | 27.8 | 34.3 | 42.7 | 53.1 | 65.8 | 81.3 | 100.2 | 123.4 | 151.9 | 186.9 |
| 37% | 8.6 | 11.2 | 14.4 | 18.3 | 23.1 | 28.9 | 36.0 | 45.1 | 56.4 | 70.5 | 87.6 | 108.8 | 134.9 | 167.2 | 207.1 |
| 38% | 8.7 | 11.3 | 14.7 | 18.8 | 23.9 | 30.1 | 37.7 | 47.6 | 60.0 | 75.4 | 94.4 | 118.0 | 147.4 | 184.0 | 229.5 |
| 39% | 8.7 | 11.5 | 15.0 | 19.3 | 24.8 | 31.4 | 39.5 | 50.3 | 63.7 | 80.7 | 101.7 | 128.0 | 161.0 | 202.4 | 254.2 |
| 40% | 8.8 | 11.7 | 15.3 | 19.9 | 25.6 | 32.7 | 41.4 | 53.1 | 67.7 | 86.3 | 109.5 | 138.8 | 175.8 | 222.4 | 281.4 |
| 41% | 8.9 | 11.8 | 15.6 | 20.4 | 26.5 | 34.0 | 43.4 | 56.0 | 71.9 | 92.2 | 117.8 | 150.4 | 191.8 | 244.4 | 311.3 |
| 42% | 8.9 | 12.0 | 15.9 | 20.9 | 27.4 | 35.4 | 45.5 | 59.0 | 76.3 | 98.6 | 126.8 | 162.9 | 209.2 | 268.5 | 344.3 |
| 43% | 9.0 | 12.1 | 16.2 | 21.5 | 28.3 | 36.8 | 47.6 | 62.2 | 81.0 | 105.3 | 136.4 | 176.4 | 228.1 | 294.7 | 380.6 |
| 44% | 9.1 | 12.3 | 16.6 | 22.1 | 29.3 | 38.3 | 49.9 | 65.6 | 85.9 | 112.5 | 146.6 | 191.0 | 248.6 | 323.4 | 420.5 |

a stable growth rate of 4 percent. Obviously, this isn't to say that the company would grow consistently at the growth rate indicated year after year, but would average this rate over the multiyear period. Keep in mind that at the end of September 1999, CSCO closed at a split-adjusted price of $34.28, reflecting the fact that it was expected that over the next six years, CSCO would grow at a rate that averaged more than 41 percent on a compounded basis. Given the company's past growth, some may have presumed that this was a possibility, but the significance of this type of performance on a free-cash-flow basis is nonetheless surprising. Table 9.5 shows a matrix of values for free cash flow at the end of the abnormal growth period.

If one grows a starting free cash flow of $3.109 billion at a rate of 35 percent for 15 consecutive years, one arrives at a cash flow amount in 15 years of more than $280.3 billion! Given an average capital expenditure proportion of 25 percent, this would imply cash flow from operations of in excess of more than $370 billion. Even a growth period of 7 years (which provides for a price that is not dissimilar to the price that CSCO traded at on September 30, 1999) presumes an annual free cash flow amount in 2006 of more than $25 billion—implying cash flow from operation of more than $33 billion. To reach a $1 trillion valuation, which some spoke of, CSCO would need to have grown its cash flow by a compounded rate of at least 41 percent over 12 years. This would have resulted in a free cash flow amount in 2012 of more than $191 billion (a much lesser discounted amount in 1999).

These are staggering figures by any stretch of the imagination. CSCO's theoretical growth rate, calculated using formula 9.6, was equal to its average ROE, as the company did not pay a dividend and was not repurchasing stock at the time. Over the preceding five-year period, this rate averaged 30.39 percent, while over the three-year period, it averaged 24.44 percent. Theoretical growth was much lower than the rate that is implied by CSCO's share price, and was falling from 1996 to 1999. Moreover, while it might have been fair to conclude that CSCO's free cash flow would grow at a rate that exceeded its theoretical growth rate, the length of time necessary to justify a price in 1999 was sufficiently long to make CSCO a very risky gamble. As I've noted previously, rates that require a very long duration—in excess of five years, in my view—inherently presume that a number of variables will remain stable. In short, when I look at the array of prices given very high growth rates and various growth durations, I don't see a compelling case for CSCO in 1999. The rates, while not too far off from CSCO's recent historical results, presumed a continuation of a trend that relied on a very high compounded rate. Clearly, given analyst comments regarding CSCO noted previously in this chapter, representativeness biases likely were playing a role, as it was thought that

**TABLE 9.5** CSCO Estimated Free Cash Flow from Operations (in $billions) under Various Growth Scenarios

| | Abnormal Growth Period in Years | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years | 6 Years | 7 Years | 8 Years | 9 Years | 10 Years | 11 Years | 12 Years | 13 Years | 14 Years | 15 Years |
| 35% | 4.2 | 5.7 | 7.6 | 10.3 | 13.9 | 18.8 | 25.4 | 34.3 | 46.3 | 62.5 | 84.4 | 113.9 | 153.8 | 207.6 | 280.3 |
| 36% | 4.2 | 5.8 | 7.8 | 10.6 | 14.5 | 19.7 | 26.8 | 36.4 | 49.5 | 67.3 | 91.5 | 124.5 | 169.3 | 230.2 | 313.1 |
| 37% | 4.3 | 5.8 | 8.0 | 11.0 | 15.0 | 20.6 | 28.2 | 38.6 | 52.9 | 72.4 | 99.2 | 135.9 | 186.2 | 255.1 | 349.5 |
| 38% | 4.3 | 5.9 | 8.2 | 11.3 | 15.6 | 21.5 | 29.6 | 40.9 | 56.4 | 77.9 | 107.5 | 148.3 | 204.7 | 282.4 | 389.8 |
| 39% | 4.3 | 6.0 | 8.4 | 11.6 | 16.1 | 22.4 | 31.2 | 43.3 | 60.2 | 83.7 | 116.4 | 161.7 | 224.8 | 312.5 | 434.4 |
| 40% | 4.4 | 6.1 | 8.5 | 11.9 | 16.7 | 23.4 | 32.8 | 45.9 | 64.2 | 89.9 | 125.9 | 176.3 | 246.8 | 345.5 | 483.7 |
| 41% | 4.4 | 6.2 | 8.7 | 12.3 | 17.3 | 24.4 | 34.4 | 48.6 | 68.5 | 96.6 | 136.2 | 192.0 | 270.7 | 381.7 | 538.2 |
| 42% | 4.4 | 6.3 | 8.9 | 12.6 | 18.0 | 25.5 | 36.2 | 51.4 | 73.0 | 103.6 | 147.2 | 209.0 | 296.7 | 421.4 | 598.3 |
| 43% | 4.4 | 6.4 | 9.1 | 13.0 | 18.6 | 26.6 | 38.0 | 54.4 | 77.7 | 111.2 | 159.0 | 227.3 | 325.1 | 464.9 | 664.8 |
| 44% | 4.5 | 6.4 | 9.3 | 13.4 | 19.3 | 27.7 | 39.9 | 57.5 | 82.8 | 119.2 | 171.6 | 247.2 | 355.9 | 512.5 | 738.0 |

CSCO's performance would fall fairly close to recent history. While it may be reasonable to expect that a trend in growth will remain intact for a number of years, such expectations become unreasonable when rates are exceedingly high. A combination of high market capitalization, expected growth that exceeded 30 percent per annum and a fairly long growth duration all contribute to an unappealing opportunity in these shares in 1999.

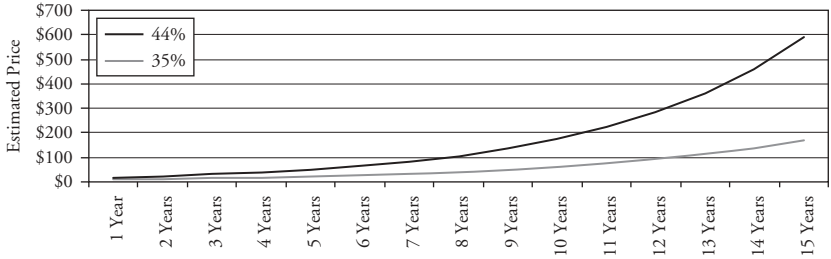
Earlier in this chapter, I spoke about the benefit of using a compounded annual growth rate in determining abnormal growth period cash flows. The benefit is largely the ability to look at valuation in the construct of a matrix, as shown for CSCO in Tables 9.4 and 9.5. In using this construct, we are able to step back from valuation, and partially remove ourselves from an assessment of growth. We can go from being one of a number of analysts making discrete predictions of growth, to being an analyst analyzing the reasonableness of others' predictions. In such a way, we are able to place growth estimates at arm's length and consider them in light of the behavioral biases discussed in Chapter 5. In short, we are able to step back and look at Tables 9.4 and 9.5 and as ask: is this reasonable?

As was alluded to in my discussion of CSCO's value in 1999, at some point we need to ask what a reasonable abnormal growth period is. We can assume that a company will grow at an abnormal rate for 15 years, but does doing so turn an investment into something much more speculative. It is difficult to look out three years or five years. To have any confidence in a 10-year abnormal growth period, we would need to assume that there are significant barriers to competition, and that the world will not change too much in that period of time. In some cases, where there is patent or copyright protection, or network benefits, this may be a reasonable expectation. In most cases, however, it likely isn't a good assumption.

Also, it's worth noting that, as Figure 9.3 indicates, the greater the growth rate, for any given time period, the more convex the relationship between valuation and abnormal growth rates become. This is similar to the convexity that one finds in bonds and, indeed, the behavior of a given stock will be similar to what we see in bond pricing. Longer-term bonds are more sensitive to changes in prevailing interest rates than short-term bonds. A 30-year bond is much more volatile than a 3-year bond. Similarly, a stock that is based on a 30-year abnormal growth period will be much more volatile than a stock that is based on a 3-year abnormal growth period.

However, at the end of the day, the greater our abnormal growth period, the more sensitive our valuation will be with regard to changes in expected growth rates. This tendency is not altogether surprising, as one's bet on the future increases dramatically as we stretch that future out. As we base decisions on ever-longer time periods, we increase the risk that even slight changes in

**FIGURE 9.3** CSCO's Intrinsic Value per Share as a Function of Abnormal Growth Duration and Magnitude




growth rates over time will knock our valuation down considerably. Indeed, the bursting of the technology bubble was an *en masse* reflection of lowered expectations on very high abnormal growth period valuations.

This is a very relevant exercise in an examination of mid- to large-cap stocks. It is one thing to "roll the dice" on a high-growth company at a low valuation with minimal cash flow or earnings. It becomes very risky as we move up the capitalization spectrum. High valuation (excessive multiples to earnings or free cash flow), large-cap stocks can be extraordinarily risky if much of what we are betting on happens in the future.

At CSCO's valuation in 1999, the company was already a mega-cap stock (with a market capitalization of more than $200 billion). Even its cash flow at that point would support at least a large-cap valuation under a much more conservative assessment. When companies get to a certain size, there come significant impediments to future growth:

- Market share improvements are diminished, as the company already has significant market share.
- Growing earnings and cash flow a significant percentage means much more in dollar terms as a company grows.
- Growing by acquisition becomes more difficult, as it takes larger acquisitions to have a significant impact on the top and bottom lines.

In short, CSCO offers us two take-aways to consider in doing any research:

1. It is very easy to get caught up in the prevailing thinking of the time—representativeness biases are reinforced by herding and feedback mechanisms (as explained in Chapter 6).

2. There is a gamble to every investment. The uncertainty that one accepts in every decision, which is principally based on expectations for the future, makes our investment decisions "bets." We are betting that an outcome will appear that is more palatable than an alternative outcome. The longer into the future that we need to "bet," the more we open ourselves to sudden changes in that attribute. This is due to the convexity of the abnormal growth period duration and the nature of the intrinsic value function.

As an aside, it's fair to ask in this case, "What does Tom know about optical networking or routers?" As a generalist, I'm not going to have as deep an understanding of a given industry as a research analyst specializing in the industry. However, this very much works to my advantage as an analyst and portfolio manager. While an industry analyst may be consumed with trying to figure out if CSCO's latest gambit will be successful or lead the industry from a product standpoint, I have the leisure of stepping back and asking far broader questions:

- Does CSCO have competitors? Answer: yes.
- Could CSCO's growth fall if competition increases? Answer: yes.
- Is CSCO priced for perfection? Answer: most likely.

It's been my experience that the greater one is enmeshed in a specialization, the more likely it is that they will fall victim to representativeness and framing biases than the individual that remains at arm's length.

The froth that characterized the late 1990s is less broadly represented in today's market. Indeed, today's large-cap technology stocks are by-and-large reasonably valued or even undervalued (obviously, there are exceptions). A surprising example is Apple Inc. (AAPL). This ubiquitous consumer electronics and distribution brand has been around a long time. However, in recent years, the company has evolved from a manufacturer of specialty/niche computers to a broad-line consumer electronics company with multiple products and significant content distribution. This evolution has brought with it heady growth, as shown in Table 9.6.

However, unlike CSCO, whose own early growth brought with it an outsized valuation, AAPL could be considered undervalued based on information available today. As was the case with CSCO, my valuation of AAPL

**TABLE 9.6** AAPL's Actual Growth Rates in Net Income and Sales and Returns on Equity

| For the Year Ending at Month-End in September | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| YOY rate of growth in revenue | 7.07% | 8.10% | 33.30% | 68.37% | 38.65% | 27.25% | 52.54% | 14.44% | 52.02% |
| YOY rate of growth in net income | nm | 4.62% | 291.18% | 399.25% | 49.77% | 75.72% | 75.08% | 34.58% | 70.16% |
| Return on equity | 1.62% | 1.64% | 5.73% | 21.26% | 22.85% | 28.51% | 33.23% | 30.54% | 35.28% |

will be based on key data points that will drive underlying valuation. In the case of AAPL, I'll presume the following:

- We will start with a fiscal 2010 free cash flow amount of $15.834 billion. This represents operating cash flow of $18.595 billion and capital expenditures (inclusive of acquisitions) of $2.761 billion.
- In this analysis, we'll once again look at various abnormal growth periods that will run between 1 and 15 years—again, the column headings in the matrix.
- The rows again reflect various estimates for growth in free cash flow.
- I'll again use a 4 percent implied equity risk premium for calculating my discount rates and I'll utilize a beta statistic of 1.25 to account for AAPL unique risk.

With these assumptions in place we arrive at the per share values for AAPL shown in the matrix in Table 9.7.

AAPL currently trades at a price of roughly $335 per share (on April 8, 2011). However, unlike CSCO, at the present time, AAPL has significant cash and marketable securities on its balance sheet. In total, these liquid investments amount to approximately $55 per share in value. It should be noted that these liquid investments have been building over the past few years as the company has not paid out a dividend or repurchased outstanding shares. If we back out this value, we get a market value for AAPL's ongoing business of roughly $280 per share.

After playing around with various base growth rates, I've utilized a range of abnormal growth rates of 3.5 percent to 12.5 percent. These are likely to be very conservative estimates. Indeed, it is clear that in fiscal 2011, the company will growth its cash flow at a rate that far exceeds 12.5 percent. Still, you can see that the market is not ascribing a very high implied value on AAPL's shares at the present time. Indeed, one could easily make the case that these shares are undervalued.

At the very least, an investment in AAPL carries much less risk than an investment in CSCO (back in 1999), as we are not paying for significant future earnings growth, nor are we paying for outsized, abnormal growth for even a short period of time.

The difficulty, of course, is maintaining a sensible or conservative estimate of growth. I would again note, and I can't stress enough, that the market capitalization spectrum is an important consideration in determining how much growth one is willing to pay for and how long one is willing to pay for outsized growth. The larger the company, in terms of sales, the more difficult growth becomes, all else remaining equal. This is irrespective of management's ability or product attractiveness. There are a number of impediments that large, high-growth companies face with each passing year.

**TABLE 9.7** AAPL Estimated Per-Share Intrinsic Value, as of April 8, 2011, under Various Scenarios

| | Abnormal Growth Period in Years | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years | 6 Years | 7 Years | 8 Years | 9 Years | 10 Years | 11 Years | 12 Years | 13 Years | 14 Years | 15 Years |
| 3.5% | 285.0 | 298.3 | 301.1 | 304.4 | 306.4 | 305.7 | 305.8 | 305.9 | 304.5 | 302.9 | 300.7 | 299.3 | 297.3 | 296.5 | 294.5 |
| 4.5% | 287.7 | 299.9 | 309.4 | 315.3 | 319.8 | 321.4 | 323.7 | 325.9 | 326.4 | 326.5 | 325.8 | 325.9 | 325.1 | 325.6 | 324.73 |
| 5.5% | 290.5 | 305.5 | 317.9 | 326.6 | 333.8 | 337.9 | 342.6 | 347.2 | 349.9 | 352.0 | 353.1 | 355.0 | 355.8 | 358.1 | 358.6 |
| 6.5% | 293.2 | 311.1 | 326.5 | 338.1 | 348.2 | 355.1 | 362.5 | 369.8 | 375.0 | 379.4 | 382.8 | 386.9 | 389.8 | 394.1 | 396.5 |
| 7.5% | 296.0 | 316.8 | 335.3 | 350.0 | 363.2 | 373.1 | 383.5 | 393.8 | 401.8 | 409.1 | 415.1 | 421.9 | 427.2 | 434.2 | 438.9 |
| 8.5% | 298.7 | 322.6 | 344.3 | 362.2 | 378.8 | 391.8 | 405.6 | 419.3 | 430.6 | 441.1 | 450.2 | 460.1 | 468.5 | 478.8 | 486.4 |
| 9.5% | 301.5 | 328.4 | 353.4 | 374.8 | 394.8 | 411.4 | 428.9 | 446.4 | 461.4 | 475.6 | 488.3 | 502.1 | 514.1 | 528.3 | 539.5 |
| 10.5% | 304.2 | 334.3 | 362.6 | 387.6 | 411.5 | 431.9 | 453.4 | 475.1 | 494.3 | 512.8 | 529.7 | 548.0 | 564.4 | 583.3 | 599.0 |
| 11.5% | 307.0 | 340.2 | 372.1 | 400.8 | 428.7 | 453.3 | 479.2 | 505.6 | 529.5 | 552.9 | 574.7 | 598.2 | 619.8 | 644.4 | 665.6 |
| 12.5% | 309.7 | 346.1 | 381.7 | 414.4 | 446.5 | 475.5 | 506.3 | 537.8 | 567.2 | 596.0 | 623.5 | 653.1 | 680.8 | 712.3 | 740.0 |

To this end, in the next section I talk about various competitive environments for goods and how these environments relate to margins. While AAPL is seemingly cheap at the present time, I do have some concerns with regard to the company's margins and how these margins could change with an evolving competitive environment.

## Recognizing that Markets Are Efficient over the Long Term: A Refresher on Microeconomic Theory

There are many reasons for unbridled optimism. I've already discussed some of our behavioral failings and certainly these cognitive errors play a large part in our own self-deception. The analyst's first perspective is shaped by the company's current and past performance. A second perspective is gained through an understanding of our inherent behavioral biases, which shape our views of the company's short-term fortunes. I would hold that a third perspective is gained by considering the company's current competitive environment and this environment's long-term durability.

Economics and finance have traditionally pointed to how stocks *should* be priced, rather than how they *are* priced. In our quest to uncover opportunities in the market, we can use these ideals as baselines of where we think a company's valuation *should* be, thus allowing us to uncover opportunities. At times, however, we must look in the opposite direction. Are we being too generous in our assumptions? The company in question has grown at a fairly rapid pace, and has managed to procure significant margins. But can we expect this growth pace and market influence to hold? While I tend to be relatively hard on economics as a discipline, it's not because I believe it's devoid of value. On the contrary, economics is a wonderful discipline, but one that has been perverted by an overt reliance on normative ("what *should* be") theory, often at the expense of positive ("what is") theory. In terms of identifying overly optimistic assumptions, our starting point should be an examination of the industry and company in terms of "what *should* be." Unlike the focus of SWOT analysis or Porter's Five Forces, our intention with this examination is to determine the type of competitive environment that the company operates in and then determine what the likely environment will be over the intermediate term to long term. In other words, how durable is the company's advantages in the intermediate term?

Market competition for goods (not for the pricing of stocks) can take many forms. We have:

- Monopolies
- Oligopolies
- Monopolistic competition
- Perfect competition

Monopolies in the United States are generally government granted, although some firms, through network externalities, gain sufficient power to exercise monopoly power in pricing. Network externalities occur when the value of a product is predicated on the number of users using the product. While Microsoft's Office software products are protected by copyrights (a government-granted form of monopoly), the monopolistic nature of the product is largely due to the network effects that the company has developed as an early software leader. In other words, people know how to use Microsoft's Excel and Word. The more individuals that are familiar with these products, the more valuable the software is to companies that want to use the software across their enterprises. While there are many word processing programs available on the market that don't infringe on Microsoft's copyrights, these programs don't have mass adoption, and thus the network effects are less valuable.

More purely, most monopolies result from government regulation of two main forms: copyrights and patents. Some of the most lucrative monopolies granted by the government take the form of patented pharmaceuticals. Drugs, like Pfizer's Lipitor, are extraordinarily profitable and generally face no direct competition and little indirect competition for years. Moreover, the value of holding patents is becoming increasingly clear, as companies increasingly seek patent troves in order to gain an edge in licensing others' patents or avoiding costly patent litigation. Google Inc.'s purchase of Motorola Mobility in 2011 is largely seen as an attempt to protect the firm's Android mobile phone software and the hardware manufacturers that make Android-powered phones.

For the large-cap investor, monopolies are enticing but also dangerous. The holder of a small-cap company with a brand new patent is likely to realize the benefits of owning the patent as the company's product is introduced to the market. Take, for example, the owner of a small, one-product pharmaceutical company. If it is granted a patent, and receives FDA approval for its product, the company can become extraordinarily valuable. In short, all of us could agree that the ownership of a monopoly would be very profitable—for the early owner. For large-cap investors, the biggest risk in owning a company with a monopoly or patented products is that the value of the monopoly is largely priced into the shares. Consequently, the company faces two

prospects: (1) its execution or demand does not live up to high expectations, or (2) competition from substitute products eats away at what was thought to be guaranteed market share.

Indeed, I do think that at the end of the day, there are very few true monopolies with staying power. Even in the world of pharmaceuticals, the playing field more often resembles an oligopoly than a monopoly. Lipitor was a monopoly for Pfizer in the sense that it was a patented pharmaceutical. However, Pfizer's cholesterol-lowering drug competed with other patented pharmaceutical alternatives such as AstraZeneca's Crestor and Merck & Company's Zocor. Moreover, individuals have other avenues to control cholesterol, such as diet and exercise, which will also inhibit pricing power to a certain extent. The Walt Disney Company has a government-granted monopoly in the form of copyrighted material. This copyrighted material is able to garner the company a premium price in the market for similar goods. If one doubts this, simply look at the pricing for Disney's *Snow White and the Seven Dwarves,* a film that was originally released in 1937, but still commands a very high price when it's re-released (from Disney's "vault") every few years. However, we would all agree that Disney's monopoly pricing power for copyrighted material has limitations. These limitations are largely due to the fact that Disney does not strictly compete on the basis of *Snow White* films or on the basis of *princess* films. Disney does not compete strictly on the basis of children's films or films in general. At the end of the day, Disney competes for dollars in parents' wallets. In this endeavor, Disney has some pricing power, but not unbridled pricing power. The company remains cognizant that they have very valuable copyrighted material, but there are substitute products that are nearly as compelling. The fact that there is no direct competition for a product doesn't mean that the company doesn't compete in some fashion.

While patented products are valuable, large-capitalization stocks usually become interesting investments, when the companies holding the patents are subject to increased competition. Competition introduces uncertainty into a market, and uncertainty creates opportunities for investors. When there are no uncertainties, the price of the company reflects that state—indeed, it probably overstates the nature of the certainty, and loses sight of alternatives.

Oligopolies also exist in many markets including the United States. An oligopoly is generally defined as a market or industry where a small number of participants control a large percentage of the market. Due to the small array of true competitors, the participants in this market are aware of what others are doing and price their products with competitive reactions in mind. The mobile phone service provider industry, dominated by AT&T, Verizon, and Sprint, is an example of an oligopoly. Automobile manufacturing is

oftentimes considered an oligopoly. Again, the investment value present in a particular common stock is oftentimes predicated on the uncertainties present in the market. The value that one sees in an investment in an automobile manufacturer is due less to its oligopoly pricing power and more to the uncertainties surrounding other aspects to the company. These aspects could include internal success or failure at operational execution or design, but they also might be exogenous factors, such as the effects of high gasoline prices.

Monopolistic and oligopolistic pricing power can be fleeting in our global economy and can mask uncertainties that may be less direct but equally devastating to the firm. While I don't believe that perfect competition exists in any market, I also believe that monopolies and oligopolies trend to more competitive environments over time. A combination of globalization and technological advances has conspired to allow for the quick development of substitute goods in almost all industries. The most dangerous position that any large-cap analyst can take is to presume that significant barriers to entry exist for high-margin products. Competition and substitute goods always lurk around the corner, and render most expectations for high-growth or high-margins irrelevant.

With this in mind, it is beneficial to consider the notion of the perfectly competitive market and a derivation, the monopolistically competitive firm. Generally, economic theory would argue that abnormal returns in any industry are fleeting. To cement this notion, let's start with the simple economic condition of perfect competition and look at how things should be as a company moves towards a less profitable and more competitive environment.

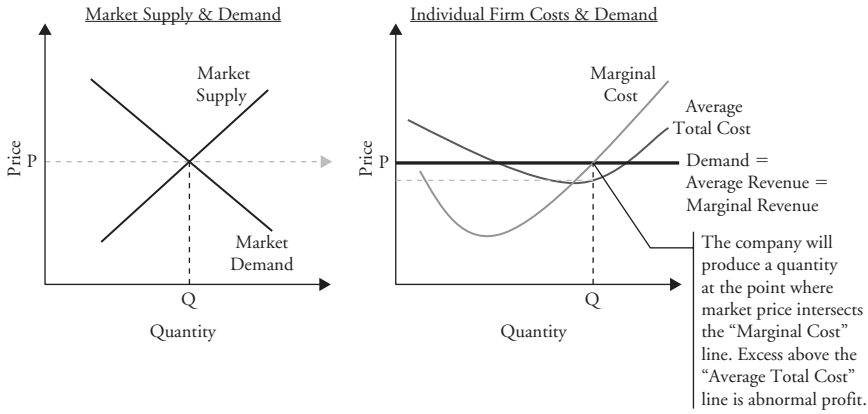
Perfect competition exists when a number of attributes are present:

- There are many, many buyers and sellers of goods.
- The goods offered are very similar.
- There are no substantial barriers to entry.

As an example, let's consider a firm that introduces a new product that is compelling and has instant demand (it could be the first commercial airline or it could be the first personal computer). We'll presume that the product has very few barriers to entry, but as it's a first mover in the market, it's able to shape the price of the product through the company's supply of the product (it controls the market supply initially). We'll presume that others are already fast at work developing alternative products or very similar products for sale in the market.

Initially, as noted, the company is able to charge a premium for their product, as market demand outstrips their supply of the product. This allows

**FIGURE 9.4** Aggregate Supply and Demand and Individual Firm Supply and Demand—Perfect Competition



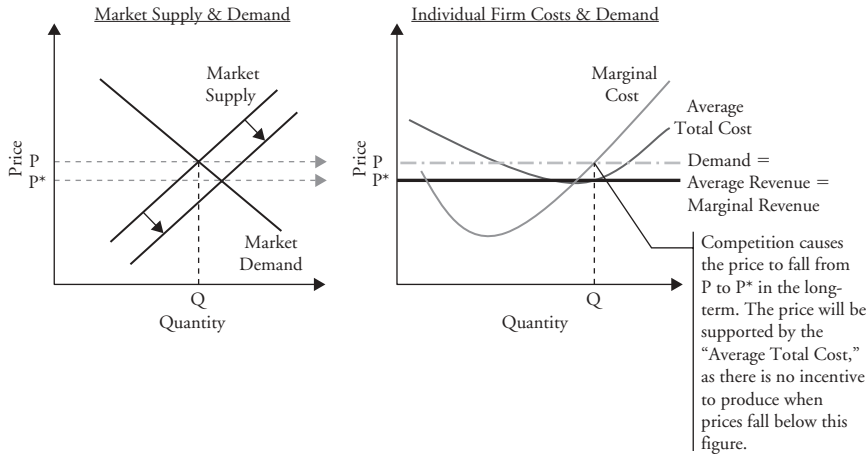

the firm to generate an abnormal profit that far exceeds their average total cost of production. This is pure economic profit, above the company's cost of capital (which should be considered part of their costs).

Under these assumptions in the scenario described, there is an economic supply and demand equilibrium point for the product. This point is a price that exceeds the individual firm's average total cost, as shown in Figure 9.4

Keep in mind that this is microeconomics and we are considering a commodity-like product—there are two functions, one for the aggregate supply and demand, and then the individual firm costs and their relation to demand. The price is set in a given market, and that price becomes the demand line for an individual firm. Over time, however, the abnormal profit is not sustainable. Economic theory in this case is rather intuitive. The arrival of new market entrants, new substitutes, expanded facilities, and a need to reach a wider audience all conspire to move the aggregate supply line lower—more products are supplied to the market at lower prices due to economies of scale as well as the ability of producers of products to do so. Keep in mind from Figure 9.4 that the firm was able to originally command a price for their product that resulted in an "abnormal" economic profit that was above the average cost of production. This means that the original company in question does have room to lower its price and still make a standard economic profit, which we presume it does in order to maintain its customer base and market share.

In short, as aggregate market supply shifts lower with increased competition and the benefits that come with increased volumes, the equilibrium price

**FIGURE 9.5** Aggregate Supply and Demand and Individual Firm Supply and Demand—Perfect Competition




falls, resulting in a demand line for the firm that shifts lower with the lower price, as shown in Figure 9.5.

This process is not abrupt, but continues until the firm's demand line (or average price of their good) falls to the average cost of production, as competitors lower their prices in order to better compete with the other firms in the market. Why would they do this? Because they can, they have the capacity to lower prices until it no longer becomes economically justifiable to do so. There are certainly many examples of this tendency, and in areas that we wouldn't suspect (it's not simply confined to the pricing of commodities). Airline seat pricing largely displays this tendency, since it's very difficult to differentiate airline service product in the domestic market (although frequent flier rewards do allow for some differentiation). We also saw perfect competition in Internet service providers—indeed, this likely led to the entire industry being subsumed by telecommunications companies. Personal computers have provided a very near-term example, as companies have taken a number of different steps to continue to lower the costs of production. Many personal computer makers lowered their prices and squeezed as much as they could out of their production processes in order to compete. Eventually, some moved production to Asian markets with lower costs, while other companies such as IBM simply exited the business altogether.

Interestingly, Apple Computer (AAPL) has for a number of years provided a differentiated product and has positioned their personal computer

product outside of the personal computer industry and, thus, did not subject it to the personal computer industry aggregate equilibrium price.

Many of the aforementioned industries would not be ideal examples of perfect competition, but they are close enough to take note of. And this is not to say that one couldn't find opportunities in industries that are subject to perfect competition. However, when one is examining growth, and relying to a great degree on outsized returns on equity and margins, it's difficult to believe that such a case could exist for a very long time. In a perfectly competitive market, movements to equilibrium—where demanded price equals average total cost—happen relatively quickly. In a less perfect environment, these movement take more time but nonetheless trend in that direction.

While one can argue that there are some differentiated airlines or personal computer manufacturers, with pricing that has not resembled perfect competition, I think they would be missing the larger point. Things are much messier in the "real world" than in economic theory. True, some personal computer manufacturers can differentiate themselves with a trusted brand and modestly higher pricing—just as some airlines can get premium pricing on routes with significant competition. But, the larger point is that the pricing is not egregiously different from the pricing of competitors, and the pricing is within the confines of a highly competitive marketplace. Margins are generally slim to begin with. Alternatively, consider a "market maker" such as AAPL. AAPL largely created the feature-laden smartphone, and as this market began to form was able to command premium pricing in the market. But does this pricing hold, or does competition eat away at AAPL's advantage? I would argue that this market is becoming increasingly commoditized, and over time, AAPL will be a leader, but they will sacrifice growth and margins to maintain this leadership position. Note that this is not a condemnation of AAPL the stock. AAPL the stock is a wholly separate issue, apart from AAPL the company. The two are related, but the two are not *representative* of one another.

But AAPL brings up a different issue pertaining to competitive environment, and that is the differentiated product. Note that I explained that AAPL has positioned their personal computers as different from the industry. Using a combination of styling and differentiated features (owing to a different operating system) AAPL has created their own market outside of the aggregate industry (personal computer market).

However, if it is not now a perfectly competitive market environment that AAPL sells personal computers in, then what is it? Certainly, market efficiency, as described previously, shows that individuals behave less than efficiently in their consumption and decision making patterns. However,

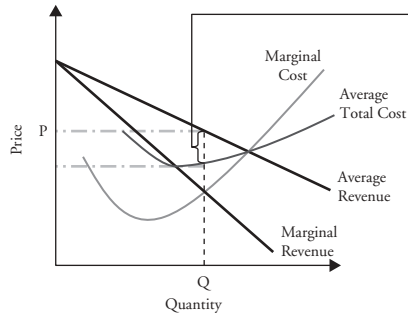
there are and will always be products that defy economic precepts of perfect competition. Coca-Cola has been around for a long time and hasn't been supplanted by generic/private label competition. There are real examples of differentiation taking place in many markets (with more commodity-oriented goods providing exceptions).

Indeed, economic theories with regard to this differentiation are not new. At the midpoint of the last century, Edward Hastings Chamberlin discussed a concept he termed *monopolistic competition* in his book on the subject, *Theory of Monopolistic Competition.*[16] Markets, in his view, were characterized by many of the same attributes that underpin perfectly competitive markets. However, inherent to monopolistically competitive markets are firms that have a degree of control over price (they are *price setters* rather than *price takers*), and consumers who perceive differences (not related to price) among competitor's products. Product differentiation or perceived differentiation is the key element to this theory. In monopolistic competition, the aggregate supply and demand is less important, as the firm is producing a product that is differentiated. Thus, marginal revenue is downward sloping at the firm level, as is average revenue. Prior to the onslaught of competition, the firm's supply and demand relationship is as found in Figure 9.6.

Still, in the long run, even monopolistic competition begins to look a lot like perfect competition. More firms are able to enter the market and tailor their products to compete more effectively with any firms with a competitive advantage. As a consequence, average revenue falls to a new equilibrium point, as shown in Figure 9.7.

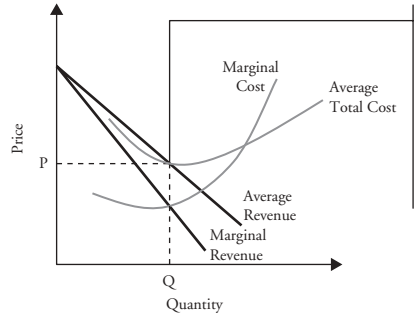
Even AAPL's personal computers are subject to competition at certain times and at certain price points. They are differentiated, but that does not mean that other firms can't imitate or emulate their successful functions.

**FIGURE 9.6** Individual Firm Supply and Demand—Monopolistic Competition




In the construct of monopolistic competition, in the short run, companies are thought to be "price setters" not "price takers" (as is the case in perfect competition). The differentiated product (even if perceived) is able to command a higher price that is set by the company—in the chart this is signified by the "Average Revenue" line's intersection by the quantity produced. Note, however, that the quantity produced is set where "Marginal Cost" intersects "Marginal Revenue," which intuitively makes sense, as a firm would not want to produce quantities that are not economically viable at the margin. Still, as marginal revenue generally would diminish as quantity increases, being a price setter, the firm is able to price above the "Average Revenue" price and generate excess profit.

**FIGURE 9.7** Individual Firm Supply and Demand—Monopolistic Competition




In the long run, as more firms chip away at a given firm's advantages, the "Marginal Revenue" and consequently the "Average Revenue" shift lower, as price becomes more of an issue for consumers (they now demand more at lower prices). The quantity produced remains at a point where "Marginal Revenue" intersects with "Marginal Cost", however, in this more competitive long-run environment, this results in "Average Total Cost" equaling "Average Revenue."

When Microsoft issued its first release of its Windows software in late 1985, it imitated a prime functionality and differentiating feature of AAPL's Macintosh personal computer line. As a result, for a while, AAPL had to lower their prices to compete more effectively with resurgent Microsoft Windows–based personal computers, or risk losing volumes and market share. In the case of AAPL and other personal computer manufactures, the introduction of Microsoft Windows created a substitute for AAPL's Macintosh that did not previously exist, and as a result affected AAPL's ability to price its Macintosh product. The result was a shift in the firm's average revenue line downward.

As noted above, the primary distinction between perfect competition and monopolistic competition is the existence of a downward sloping demand curve—since one's products differ (even if only in perception) from other firm's products, the company has some power in setting prices. The firm has its own demand curve and this demand curve is not set at a product level. Consumers recognize the firm's differentiated product, and thus ascribe it a demand function that differs from other products. If the firm offers lower prices, it will get more takers, and as a consequence it will sell higher quantities. In perfect competition, the firm does not set the price, the firm is a *price taker*—its economic profit is already zero, so for the individual firm there is nowhere to go. Thus, the demand curve in perfect competition may shift downward for the market, but the company can sell as much quantity as they would like at a given price (its products feed into a larger market). In this respect, there may be a downward sloping demand curve for the product (or commodity if you will), but at the firm level, the demand curve is flat.

It should be noted that there has been some debate over the existence of monopolistic competition.[17] Empirically, it appears evident that at least from a short-term perspective there is differentiation taking place, and there are

firms that are able to earn an economic profit that falls above zero. In the end, however, both theories move to an equilibrium that is characterized by zero economic profit—in other words, firm's differentiated products get chipped away at by competition (either copycat products or substitutes), and the firm increasingly competes on price.

In technology, this move from short-term to long-term seems to be truncated. Let's, for example, consider AAPL's iPhone. The iPhone had been a unique device, whose central purpose was to communicate with others via text, voice, or e-mail. In this sense, the iPhone had numerous competitors—RIM's Blackberry, phones using Google's Android, and phones using other operating systems. Still, this was not truly a perfectly competitive market, due to any given phone's styling and numerous other features that moved beyond the phone's central purpose. The iPhone, in differentiated ways, was unique and able to command a premium in the marketplace (or at least sell more quantities at a given price). Still, today one gets the sense that the features that made the iPhone unique are being gradually (or some might say quickly) chipped away, as competitors such as software makers Google and Microsoft introduce similar features. Unless Apple dramatically adapts, it is likely that its excessive economic profit or unit volumes will diminish overtime.

It doesn't take much thinking to identify significant market share changes in the cell phone handset market. RIM at one point was very differentiated and novel, certainly as novel as the iPhone is today. Today, the iPhone is novel, although Google's Android appears to be making significant inroads.

In short, there is an economic basis to expect excessive profit in the short-term, and indeed, empirically there is also evidence that supports this assertion—even for products that are commodity-like. However, there is also both a theoretical and empirical basis to expect that over time profitability diminishes. The previous examination of both perfect competition and monopolistic competition provides a fairly good rationale for what appears in domestic markets for most goods.

Still, this is not to say that the long-run case of monopolistic competition holds tight. To the contrary, I don't think it does, and there is ample empirical evidence to support my assertion. Coca Cola, the Gap, Kraft Foods, all have fairly significant brand value that allows them to sell products at a premium to what we would expect in a perfectly competitive market or in accordance with the theory of monopolistic competition. Moreover, in many cases this premium has existed for decades.

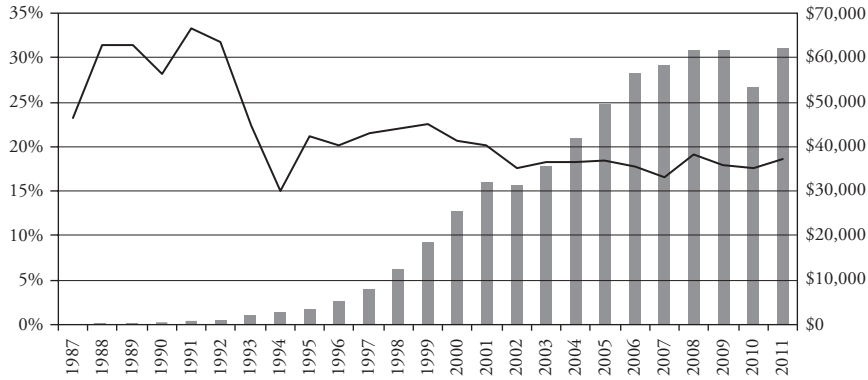
However, the margins for these companies are neither stable, nor are they abnormally high. While it is true that economies of scale likely give all of these companies a competitive advantage in terms of production and pricing,

all of the firms also have invested heavily in branding and identity. They have carved out perceived attributes that allow them to sell goods at prices that eclipse the prices of very similar goods. Still, differentiation does not allow companies to simply grow at an abnormal rate forever, nor does it allow for the type of supersized growth that we see from many hyper-"growth" technology or consumer product companies.

Take, for example, Dell Inc. (DELL), the Texas-based manufacturer of computers. While DELL has grown significantly since the early days of the PC, its gross margins have trended downward, as shown in Figure 9.8.

At the end of fiscal 2001, ending February 2, the increasingly commoditized desktop and notebook PC segments of DELL's product groups accounted for just over 75 percent of DELL's revenues. At the end of fiscal 2006, this proportion of revenues from these groups had fallen to approximately 63 percent, and at the end of fiscal 2011, the proportion was roughly 55 percent. To adapt to an increasingly commoditized environment, DELL has worked to diversify their revenues and devote increasing investments to high margin businesses. In spite of moving a greater proportion of their business from personal computers to servers and technology services (higher-margin product groups), DELL could not escape the drumbeat of margin erosion. Much of this erosion has come as a result of an increasingly commoditized PC market, but margins in other segments of technology (such as servers for large enterprises) have eroded over time as well. While we would expect that higher revenues would result in economies of scale and higher gross margins; the increasingly commoditized nature of DELL's primary business resulted in gross margins that staid fairly stagnant during the 2000s.

**FIGURE 9.8** Dell Inc. Gross Margin (%) and Revenue ($ in millions)



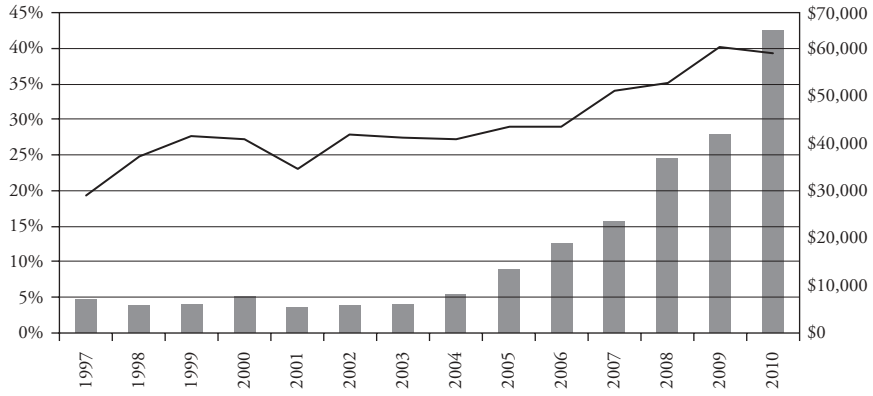
This is not to say that DELL has performed poorly or is not a good investment at the present time. The company's gross margins have not eclipsed 20 percent in almost 10 years, but the company has increased revenues significantly and improved their operating margins in recent years. The company continues to produce significant cash flow, and indeed, we currently own the company at this point in our portfolios.

However, where DELL is from a competitive and financial performance standpoint is very different from where AAPL is at the present time. Thanks to new higher-margin products such as smartphones and tablet PCs, AAPL has gone from having very nice 20 percent-plus gross margins to having gross margins that have eclipsed 30 percent for a number of years. This trend is shown in Figure 9.9.

This has come, as revenues have moved significantly higher. Still, while I would suspect that many of AAPL's products will allow for better than industry margins, due to their differentiated features and design (making them monopolistically competitive, rather than purely competitive), I would not expect that they would hover around 40 percent. AAPL has done a wonderful job in managing their businesses, and has created truly beautiful products in recent years, but many substitute products or copycat products are either on the way to market or being introduced to the market at the present time.

So given AAPL's and DELL's current competitive positioning and product offerings, which company's gross margins are more secure? Do I feel more comfortable with DELL being able to produce products with mid- to high teen gross margins, or do I expect that AAPL's margins will continue to remain above 35 percent?

**FIGURE 9.9** Apple Inc. Gross Margin (%) and Revenue ($ in millions)



If we don't recognize that Apple is vulnerable, and that their near-term results are not set in stone, then as we formulate an expectation of the future, we are violating a basic precept of probability theory (a non-Bayesian formulation of our expectations). We are not integrating the broader historical record for high-tech firms, which is considerably different from Apple's near-term results.

Again, this is a comment on AAPL's margins and financial performance and not a condemnation of APPL the stock. As noted earlier in this chapter, AAPL's common stock trades at a value that implies very little forward growth. While this may be a reflection of the current market environment, which remains mired in a number of macroeconomic uncertainties, it likely also reflects to a certain degree that a 35 percent-plus gross margin is unsustainable. Still, we are not comfortable with the risk of margin compression that we see inherent in AAPL's operations, so this is a stock that we have not invested in at the current time. In short, AAPL is very difficult to assess at the present time, given a valuation implying low growth, but products with unsustainably high margins. While I think a case can be made that AAPL is a good value, we don't think it's opportunistic enough for our portfolios at current pricing.

Just as behavioral errors cause individuals to make poor decisions with regard to the purchase of common stocks, they are equally prevalent in the world of consumer products. Consequently, there will always be many companies that produce above average gross margins and higher than average returns on equity for long periods of time. Still, it's necessary to be skeptical of outsized growth and growth "stories" that rely on significant periods of hypergrowth or even just above average growth to payoff.

In short, we can look at our decision making in the following way:

1. Avoid hypergrowth stocks altogether.
2. Don't avoid hypergrowth stocks, but
   a. Determine limits of forecast abilities:
      i. Growth rate determination (magnitude) vs. growth rate longevity (duration of hypergrowth period)
      ii. Determine ability to overcome long-term economic forces
   b. Determine comfort level with volatility implied by growth duration and magnitude decisions.

There are certain types of stocks that value-oriented managers are attracted to, and they generally are not stocks characterized by hypergrowth periods. Whether done formally or intuitively, there is a draw to lower margin businesses, where competition is difficult. There are many businesses that have very strong free cash flow, but low margins and significant barriers to entry.

Telecommunications companies, including cable and telephone service companies as well as grocers come to mind. Margins are already low, so there is a lower likelihood that they will move lower unless management is doing a relatively poor job of executing from an operating standpoint. Still, keep in mind, that there is a difference between the intrinsic value in a company and its value in the market. There are occasionally very good, faster growing companies that sell at a discount to intrinsic value, during times of market upheaval or in times of uncertainty. While one is unlikely to see a hypergrowth company fall into a valuation screen or appear appealing in relation to its intrinsic value, there is no dictum that would necessarily preclude one from doing so.

## Some Further Considerations When Predicting Growth Rates

While predicting growth is difficult and most analysts on average fail miserably at the task, at the end of the day it's necessary. Some might say, "No, I look at P/B ratios and other factors!," but all valuations have either explicit or implicit growth rates. As was explained in the last chapter, all relative valuation metrics can be related to intrinsic value and thus have an implicit growth rate inferred within the measure. At least when one chooses an explicit growth rate, one is aware of the rate and can evaluate it in a proper context or perspective.

Moreover, growth forecasts are not conducted in a vacuum. Ascertaining what the future holds requires weighting the likelihood of various outcomes. This happens with regard to forecasting the likelihood of broader economic effects (such as an economic recovery or an economic decline), but also pertains to more specific circumstances involving individual companies. Let's take, for example, Apple Inc.'s likelihood of continued high ROE, high margin results, and abnormal growth. What are the determinants of this prosperity? For one, some of Apple's success is predicated on the execution of their business plan and is internal in nature. There are also, however, external forces that work to undermine or support Apple's success. Competitive threats, changing technology, changing taste, commodity prices, the broader global economy and the more specific economic trends in major Apple markets (such as the United States and European countries). The likelihood that Apple designs attractive and functional machines may be quite high, but the likelihood that they do so while also combating competitive threats and a stagnant economy is less clear. In short, it is rarely the case that a company's success is based on a simple probabilistic outcome, and is more often the case

that many uncertainties must be recognized in conjunction with the company's own relative merits. Unfortunately, as was explained in Chapter 5's discussion of Bayesian inferences, most individuals are not adept at forming expectations that rely on multiple probabilistic outcomes.

Also, feedback mechanisms confirm or buttress the error-laden assessment of value that emanates from representativeness heuristics. Recall from my earlier discussion of market efficiency, that the call of herd behavior is very difficult to ignore. Even if we strive to be rational beings and we're conflicted over whether to employ a representativeness heuristic or follow a more rational course of assessment, a chorus of peers, pundits and other "experts" will conspire to move us towards the more irrational decision. This is the more insidious element to cognitive errors—the information that is swaying us is likely swaying others as well. But this concurrent *sway* is not taking place in a vacuum. It's accosting one from the television, the Internet and the water-cooler, reinforcing the notion that one is on the right track.

Moreover, it is difficult to escape the short-term focus that belies the long-term nature of stock valuation. While so much of value is wrapped into long-term company performance, it is difficult to escape a constant barrage of information that is singularly of a short-term nature:

- Earnings estimates
- News coverage
- Price reaction

All three of these converge to drive the investor crazy. While a quarterly earnings *beat* or shortfall may be very, very minor in the long term, and is a very minor component to a company's intrinsic value, it often has a disproportionate effect on the value of the firm in the market. When a company beats earnings estimates in a quarter, its' stock oftentimes jumps significantly, while falling short of expectations results in the stock price falling disproportionately. These reactions follow from representativeness biases, where market participants are lending significant credence to short-term performance or events, outweighting a more rational or objective assessment of the company's long-term fortunes.

## Solutions

As I've noted previously in this chapter, our overarching goal is to remove ourselves from the forecasting business, and turn our process into one that

critiques others estimates. But, to do this, we must consider growth from a number of angles in order to have a perspective on which to evaluate other's implied growth rates. As part of this process, we examine the following attributes in order to gain a broader perspective on a company's prospects for growth in coming years.

1. **Be aware of others' estimates of long-term growth.**

   This includes consensus analyst estimates from FactSet or Reuters, as well as individual analyst estimates from specific researchers or objective research organizations like Value Line and Morningstar.

   The consensus estimate is an average estimate of a variety of analysts, usually from large Wall Street brokerage firms. The quarterly estimates may be useful for modeling cash flows, but I'm generally more concerned with three- to five-year expectations, as these expectations have a much more pronounced impact on underlying intrinsic valuations than very near-term quarterly forecasts. The long-term growth rate is usually expressed as a percentage rate. Moreover, one will find that often times fewer analysts will provide this long-term forecast than the number of analysts that provide quarterly growth estimates. For example, Reuters shows that there are 24 analysts providing quarterly earnings estimates for Home Depot Inc., but only 9 of these analysts provide Reuters "LT Growth Rate" estimate. Note that Reuters' long-term growth rate is really a rate that should be used for the short-term abnormal growth period, not the long-term sustainable period. In my context, consensus estimates of long-term growth shows the short-term nature of analyst output at the present time, as their view of the long-term is really a three- to five-year period.

   Remember that professional analysts are as much prone to behavioral errors as an individual is. Any external analysis must be considered in the context of what behavioral errors could be present. A good starting place is to consider the analyst's word choice and rationale as these are clues to whether the analyst is a approaching the task of investment valuation in an objective manner.

2. **Determine what is theoretically possible.**

   Recall that, theoretically, growth is a function of the firm's retention rate and return on equity, as was found in formula 9.6. While it is certainly possible for firms to growth at a rate that exceeds this rate, such growth is usually not sustainable. Using calculations of the firms modified retention ratio over time, as well as returns on equity, we can construct averages over various time periods to arrive at an estimate of growth.

Recall from my discussion of this estimate earlier in this chapter, this should be but one element in the assessment of a growth rate for future estimates of earnings and cash flow. It will differ significantly from period to period.

3. **Examine the trend in earnings growth from a historical standpoint.**

   What has the firm achieved in terms of earnings and cash flow growth over the past 3 years? Past 5 years? Past 10 years? Knowing that we are prone to representativeness biases, these numbers should always be viewed with a skeptical eye. Large-cap firms with very large earnings and cash flow have an increasingly difficult time growing these cash flows, as they are trying to grow off of an ever-larger base of earnings.

4. **Examine the firm's attributes from the context of the competitive environment.**

   Is the company operating as a monopoly? Is the company's market best characterized by monopolistic competition? Does the company's gross margins and operating margins reflect this market environment? Next, realistically, where is the company headed? Most monopolies do not stay monopolies forever. Monopolistic competition, likewise, begins to look a lot like pure competition as time goes by. While companies can sustain returns that exceed their costs of capital, determine how egregiously high the returns and margins are in relation to competitors or substitute products. The question is: where is this company headed in the intermediate term?

5. **Try to determine what the firm's implied growth rate equals, given its valuation in the market.**

   To this end, using a matrix of different attributes (such as the prior growth rate and growth duration matrixes) can be useful in estimating what growth rate is implied by current market valuations. This is likely one of the more revealing and relevant examinations that one can do in assessing a company's current share price and intrinsic value. Growth is difficult for most analysts to incorporate into valuation estimates, as it is predicated on a certain magnitude and duration. If we move outside of a singular examination of a company, given a singular assessment of growth, we can learn much about how other market participants may be viewing the company's prospects.

   In short, a matrix examination can give investors much to think about. Given the convexity that was discussed earlier, we can see inherent risks and the true margins of safety that are established by the current share price in relation to what we think are reasonable estimates.

All of this information should be weighed in relation to our understanding of the behavioral errors we (and others) make in the process of evaluating uncertainties. This is a nuanced view of estimated growth, and I offer no magic calculations or easy shortcuts in arriving at specific numbers. Still, at the end of the day we should keep in mind that we are making a gamble. Hopefully, we can feel confident that the odds are clearly in our favor, as the margin of safety that we are assuming is sufficient to make a number of eventualities desirable in the context of our purchase price. It is almost certain that our growth rates will be incorrect. The question is how much off the mark are we? Have our assessments been reasonable, or are they very far off from what was achievable. As we may have to maintain a holding for a number of quarters if not years, we need to feel confident that our estimates are within a reasonable range—in the absence of this confidence we should sell the stock or not invest in it at all.

## Conclusions

This chapter has covered a lot of ground. It is one of the cornerstones of this book, and it sought to provide a very encompassing and nuanced view of investment valuation and how it fits into broader notions of short-term market efficiency and long-term market efficiency.

While I've wound my way through various assessments of growth, ultimately, what is most important is the market's implied growth rate. As a myriad of behavioral biases tend to insidiously work their way into growth forecasts, we are likely best served by taking ourselves out of the forecasting business. I'll admit this is ultimately not possible. All decisions to purchase a common stock entail either an implicit or explicit assessment of growth. However, the more we can shape our process in ways to objectively approach growth estimates, the more successful we will be in avoiding behavioral errors. To this end, setting out to predict the variety of factors that must be integrated into a growth forecast opens one up to too many cognitive errors. We are better served by critiquing the market's and others' assessments.

There are a number of data points that can be called on in our deliberations:

- Given the company's investments, as a proportion of earnings or cash flow, and the company's returns on investments, we can calculate what I've termed a theoretical growth rate. This rate, while dependent upon a number of inputs remaining static from year to year, is a reasonable estimate of the company's prospects.

- What has the company done historically? How has the company grown its earnings, cash flow and revenues from year to year, over the recent past and intermediate term? In assessing historical growth, we must always be mindful of representativeness biases, as it is very easy to see recent results as representative of what to expect in the future.
- What are other analysts predicting in terms of short-term growth? Again, the analyst should be cognizant of the environment and the ways in which recent results are clouding reasonable assessments. However, keep in mind that anchoring to other analysts' forecasts, or to recent results is common, and appealing—especially for young analysts that lack the confidence and experience to veer from the herd.
- Finally, while I've argued that the market is a less than efficient pricing mechanism in the short-term, I do believe that the market ultimately drives both valuations and product prices towards long-term economic equilibrium. Consequently, any company's current and past earnings should be placed into the context of the firm's long-term competitive environment. Abnormal profits, of an excessive magnitude, tend to be fleeting, and barriers to competition tend to fall rather quickly, when margins and returns are significant.

In the end, however, we take all of these data points, and assess the reasonableness of the market's implied growth forecast. Is the market being reasonable? Is there inordinate optimism, or is there inordinate pessimism? Is the market's assessment of growth reasonable, given the data points I have at hand, given what I know about the company's markets and given what I know about other firms, success with staving off competition? While we must always do significant fundamental analysis on the company's markets and product offerings, we want to offer a critique of others' work rather than make steadfast predictions.

What I'm proffering here is more of a worldview than a template for research. This chapter was meant to offer two additional perspectives to augment traditional analysis. But while I've not dwelled on an examination of a company's 10-Ks, annual letters to shareholders, and other publicly available information on the company, these are baseline necessities in doing any fundamental research. While I don't approach valuation with the thought that much new can be gleaned from an analysis of 10-K filings, it is not to say that I don't examine them carefully. Regulatory filings and other public information that market efficiency theorists contend offer no edge will give the practitioner an understanding of a company's operations and risks. Examining segment information, asset values and off-balance-sheet risks

is paramount in thoughtful analysis, and will allow the analyst to have the information necessary to place cash flow growth forecasts in a proper context. Note that I'm speaking in this chapter of principally making a more objective assessment of a company's future prospects by including a second and third perspective in one's research. However, considering a company's prospects in differing perspectives requires that one understand the company and its operations. There's no substitute for in-depth analysis of regulatory filings and proclamations on strategy in order to do this.

In the next chapter, I'll bring together the thoughts and ideas presented in this chapter and the last, examining the Hewlett-Packard Company, as a case study. While I've covered a lot of ground over the last two chapters, hopefully the analysis provided in Chapter 10 will cement some of these ideas in the context of real analysis.

## Notes

1. James Montier, *Behavioral Investing: A Practitioner's Guide to Applying Behavioral Finance* (Chichester, England: John Wiley & Sons, 2007), 315.
2. Ibid., 109.
3. John Burr Williams, *The Theory of Investment Value, Fraser Publishing* (Cambridge, MA: Harvard University Press, 1938/Reprint 1997).
4. Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* (New York: John Wiley & Sons, 2002).
5. Frank K. Reilly and Keith C. Brown, *Investment Analysis & Portfolio Management,* 7th ed. (Mason, OH: South-Western, 2003).
6. I would never recommend that one use the beta calculated for an individual security. Generally, when available, we want to use an average of unlevered betas, that are then relevered to account for a company's capital structure (in the case of equity valuation), or simply used unlevered when examining the value of a firm as a whole (inclusive of debt and equity), as in an adjusted present value model. The point is that the standard error on a specific company's calculated beta is generally too great, so we use an average of many similar companies. As Damodaran points out in the aforementioned Investment Valuation, the type of business that a firm is in is paramount in this assessment. For example, when evaluating ExxonMobil Corporation, we may want to use an average of unlevered betas from Chevron Corporation, ConocoPhillips Corporation, and a number of other large multinational integrated oil companies.
7. Gustaf Torngren and Henry Montgomery, "Worse Than Chance? Performance and Confidence among Professionals and Laypeople in the Stock Market," *Journal of Behavioral Finance* 5(3) (2004): 148–153.
8. Montier, 135.

9. Robert Shiller, "Bubbles, Human Judgment, and Expert Opinion," *Financial Analysts Journal* 58(3) (2002): 18–26: 18.
10. Damodaran, 283.
11. For common stock investors the uncertain nature of intermediate-term and long-term assumptions makes the aforementioned frameworks less valuable. SWOT and Porter's Five Forces tend to dismiss as irrelevant the attendant uncertainties that accompany presumptions regarding the attributes examined. For more criticisms see Kevin P. Coyne and Somu Subramaniam, "Bringing Discipline to Strategy," *McKinsey Quarterly* 4 (1996) 29–39.
12. Dennis Taylor, "Firm's Market Cap Climbing to $1 Trillion," *Silicon Valley/San Jose Business Journal* (March 19, 2000), http://www.bizjouranals.com/sanjose/stories/2000/03/20/story2.html.
13. Ibid.
14. Ibid.
15. Capital Expenditures, in this case, are investing cash flows that are not directed to "investments." This estimate is comprised of a number of line item factors in the "Cash Flow from Investing Activities" section of the "Consolidated Statement of Cash Flows," including: "Acquisition of Property and Equipment," "Purchases of Technology Licenses," "Acquisition of Businesses, Net of Cash and Cash Equivalents," "Net Investment in Lease Receivables," "Other," as well as other items, depending on the year.
16. Edward H. Chamberlin, *The Theory of Monopolistic Competition,* 6th ed. (Cambridge, MA: Harvard University Press, 1950).
17. Jan Horst Keppler, "The Genesis of 'Positive Economics' and the Rejection of Monopolistic Competition Theory: A Methodological Debate," *Cambridge Journal of Economics* 22 (1998): 261–276.

*The Large-Cap Portfolio: Value Investing and the Hidden Opportunity in Big Company Stocks*
by Thomas Villalta


# CHAPTER 10

# Hewlett-Packard Company Case Study

While Chapter 9 provided some examples of stocks that proved to be less than opportunistic, this chapter will offer a case on what I view as a very opportunistic stock that touches on many elements discussed in chapters eight and nine. Throughout this chapter I'll discuss the Hewlett-Packard Company (HPQ), an investment Jones Villalta Asset Management made in the third quarter of 2011.

HPQ came to our attention in two forms in the third quarter of 2011. First, given that HPQ is one of the largest companies in the United States, anyone who is attuned to business news would have been apprised of the company's strategic changes and steep share price decline in the summer of 2011. Second, in August 2011, HPQ began showing up near the top of our proprietary filtering algorithm, as its share price had declined considerably in July and August.

It's worth noting that our filter is an amalgamation of various relative valuation criteria, including two of the metrics discussed in Chapter 8. It's sufficient to note that at the time, the company was trading at a price-to-book (P/B) multiple of just 1.16. This was in spite of historical returns on equity that ranged between 6.6 percent and 21.5 percent over the preceding 10-year period, as shown in Table 10.1.

HPQ's average return on equity (ROE) over the preceding 10-year period was 14.8 percent. This is an exceedingly higher ratio for a company that trades at close to book value. Indeed, examining the proportional metric equating ROE to P/B discussed in Chapter 8, we can see the relationship to other domestic stocks at the time. On the basis of expected ROE to P/B, HPQ is afforded a value of 12.74 [$(0.148 \times 100)/1.16) = 12.74$]. Recall that ROE is

**TABLE 10.1** HPQ Return on Equity, Preceding 10 Years

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Return on equity (ROE) | 12.5% | 6.6% | 9.4% | 10.8% | 12.7% | 15.1% | 18.9% | 21.4% | 18.9% | 21.5% |

*Data Source:* Calculated from SEC 10-K filings.

a driver of P/B, and the metric that I've created is meant to provide a measure of average ROE per unit of book value. On this basis, International Business Machines Corp. (IBM) was priced at a multiple of 6.73, EMC Corp. had a multiple of 5.35 and Dell Inc. was priced at 10.21. Moreover, the 50 largest stocks in the domestic stock market at this time maintained a median metric of 7.81. So, on the basis of average historical ROE in relation to P/B value, HPQ looks interesting and is a stock that we would want to investigate further.

Still, even without considering a filter-driven examination of HPQ, one might have been intrigued by HPQ's share price decline in conjunction with recent strategic changes in the firm's direction. At the time that we began looking at HPQ, the company had released their fiscal third-quarter earnings, which coincided with a number of announcements concerning the company's strategic direction. While HPQ's fiscal third-quarter earnings were slightly better than expected, the company did lower expectations for the fiscal fourth quarter. More importantly, HPQ announced that they would consider the divestiture of the company's Personal Systems Group and would exit "smartphone" and tablet products in 2011. Further, the company announced its largest acquisition in many years, the purchase of Autonomy Corp., a U.K.-based maker of enterprise search software. These announcements were made on August 18, and the next day HPQ's shares fell approximately 20 percent. By September 9, HPQ was trading at six-year lows, with a share price that fell below prices in early 2009. In short, expectations for HPQ, as indicated by the collective wisdom of the market, were now well below expectations for HPQ at the height of the financial crisis in early 2009, an arguably more harrowing environment, with exceedingly pessimistic projections.

## A Look at HPQ's Historical Performance and Operations

If we look at HPQ's operating results over the past few years, as provided in Tables 10.2, 10.3, and 10.4, we get a more objective sense of the company's operating segment performance.

**TABLE 10.2** HPQ Revenues by Operating Segment ($ in millions)

| Operating Segment | 2007 | | 2008 | | 2009 | | 2010 | |
|---|---|---|---|---|---|---|---|---|
| | $ | % | $ | % | $ | % | $ | % |
| Services | 16,646 | 15.7 | 20,977 | 17.5 | 34,693 | 29.8 | 34,935 | 27.2 |
| Enterprise Storage and Servers | 18,769 | 17.8 | 19,400 | 16.1 | 15,359 | 13.2 | 18,651 | 14.5 |
| Software | 2,325 | 2.2 | 4,220 | 3.5 | 3,572 | 3.1 | 3,586 | 2.8 |
| Personal Systems Group | 36,409 | 34.4 | 42,295 | 35.2 | 35,305 | 30.3 | 40,741 | 31.7 |
| Imaging and Printing Group | 28,465 | 26.9 | 29,614 | 24.6 | 24,011 | 20.6 | 25,764 | 20.0 |
| Financial Services & Corporate | 3,098 | 2.9 | 3,663 | 3.0 | 3,441 | 3.0 | 4,910 | 3.8 |
| Total | 105,712 | 100.0 | 120,169 | 100.0 | 116,381 | 100.0 | 128,587 | 100.0 |

*Data Source:* SEC 10-K filings.

**TABLE 10.3** HPQ Operating Segment Income ($ in millions)

| Operating Segment | 2007 | | 2008 | | 2009 | | 2010 | |
|---|---|---|---|---|---|---|---|---|
| | $ | % | $ | % | $ | % | $ | % |
| Services | 1,829 | 17.4 | 2,518 | 19.7 | 5,044 | 37.7 | 5,609 | 35.9 |
| Enterprise Storage and Servers | 1,980 | 18.8 | 2,577 | 20.2 | 1,518 | 11.4 | 2,402 | 15.4 |
| Software | 347 | 3.3 | 499 | 3.9 | 684 | 5.1 | 759 | 4.9 |
| Personal Systems Group | 1,939 | 18.5 | 2,375 | 18.6 | 1,661 | 12.4 | 2,032 | 13.0 |
| Imaging and Printing Group | 4,615 | 41.1 | 4,559 | 35.7 | 4,310 | 32.2 | 4,412 | 28.2 |
| Financial Services & Corporate | 98 | 0.9 | 241 | 1.9 | 150 | 1.1 | 413 | 2.6 |
| Total | 10,808 | 100.0 | 12,769 | 100.0 | 13,367 | 100.0 | 15,627 | 100.0 |

*Data Source:* SEC 10-K filings.

In the context of operating results, the company's decision to increase its exposure to software, while divesting itself of its Personal Systems Group, appears prudent. Software, while currently a small segment within HPQ, has provided some of the highest margins of HPQ's businesses. The Personal Systems Group's margins are comparably lackluster, but not altogether surprising given the increasingly commoditized nature of the PC industry.

**TABLE 10.4** HPQ Operating Segment Margins and Return on Operating Assets (percent)

| Operating Segment | 2007 | | 2008 | | 2009 | | 2010 | |
|---|---|---|---|---|---|---|---|---|
| | Margin | ROA | Margin | ROA | Margin | ROA | Margin | ROA |
| Services | 11.0 | 10.6 | 12.0 | 5.9 | 14.5 | 11.6 | 16.1 | 12.7 |
| Enterprise Storage and Servers | 10.6 | 14.6 | 13.3 | 22.1 | 9.9 | 13.0 | 12.9 | 16.3 |
| Software | 14.9 | 4.1 | 11.8 | 5.6 | 19.2 | 7.7 | 21.2 | 7.1 |
| Personal Systems Group | 5.3 | 13.7 | 5.6 | 14.4 | 4.7 | 11.2 | 5.0 | 12.8 |
| Imaging and Printing Group | 15.2 | 29.6 | 15.4 | 32.2 | 18.0 | 36.8 | 17.1 | 36.5 |
| Financial Services | 3.2 | 1.1 | 6.6 | 2.6 | 4.4 | 1.4 | 8.4 | 3.4 |

*Data Source:* SEC 10-K filings.

Largely, however, HPQ's share price decline reflects the uncertainty that comes with a change in strategy. The market loathes uncertainty. Changes in direction, regardless of the merits, always instill a fair amount of uncertainty into a situation. The large-cap analyst's job is to determine if the company's market valuation is a reflection of an objective assessment of the company's prospects. Such an assessment will gage whether old or new uncertainties are being approached in a manner that is improperly affected by behavioral biases or cognitive errors.

In an objective assessment of HPQ's prospects we must first acknowledge that the Autonomy acquisition is now a sunk cost. Whether HPQ overpaid for Autonomy is only relevant in so far as it indicates management's inability to adequately value an acquisition. In truth, it will be several years before we know the true affect of the Autonomy acquisition.

The Personal Systems Group, while a very significant proportion of HPQ's revenues (31.7 percent of revenues in fiscal 2010), is a much smaller proportion of the company's operating income (at 13.0 percent). Given the company's share price decline, you would think that the company is simply shutting down the division. However, if HPQ ultimately decides to get rid of the Personal Systems Group, we will get something for it. We'll either get shares of a spin-off or HPQ will get cash.

More importantly, HPQ's cash flow from operations (CFO) has grown considerably over the past 10 years, and free-cash-flow, while choppy,

given HPQ's acquisitions in recent years, remains respectable, as shown in Table 10.5.

In addition, in the first nine months of 2011, HPQ generated cash flow from operations of $10.239 billion, with maintenance capital expenditures of $2.372 billion (23.2 percent of CFO) and net acquisitions of $180 million. This resulted in free cash flow of $7.687 billion. Note, that HPQ made a number of acquisitions in 2007, 2008, and 2010, including the acquisitions of 3PAR and Palm in 2010, and the acquisition of EDS in 2008. Including acquisitions, over the past 10 years, on average, approximately 52 percent of HPQ's cash flow from operations goes toward capital expenditures. On the basis of net additions to property, plant and equipment, or what I would term "maintenance" capital expenditures, this proportion falls to approximately 26 percent of cash flow from operations. 2007, 2008, and 2010 appear to fall outside of the norm, in terms of acquisition activity. However, if it takes acquisitions to grow cash flow, then we should consider them in terms of HPQ's free cash flow generation ability. Still, if this is the case we must also concede that HPQ will be growing cash flow from operations as well.

At the time of this analysis (early September 2011), HPQ is mired in a slow growing, global economic environment with the specter of contraction in its' Europe, Middle East, Africa (EMEA) region. Going forward over the next 12 months, what can we expect of HPQ? Is it reasonable to presume that at this point in the economic cycle we can expect growth, as the company continues to recover from the Great Recession? Or should we consider no growth or contraction? In truth it doesn't matter too much, as we are principally concerned with the implied compounded growth rate over what we perceive as being the abnormal growth period. Generally, this time horizon will encompass the next three to five years..

In making an objective assessment of HPQ's growth prospects going forward, I think it's useful to summarize some of the more objective and salient data points in our examination:

- With investments, HPQ has more than quadrupled cash flow from operations over the past 10 years.
- HPQ's cash flow from operations (CFO) moved lower from 2008 to 2010, but looks to be higher in 2011. HPQ hasn't been immune from the current economic environment.
- HPQ's average shares outstanding have shrunk every year since 2003, as the company has returned cash to shareholders (via share repurchases).

**TABLE 10.5** HPQ Cash Flow and Capital Expenditure Data ($ in millions, except % as indicated)

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cash flows from operations | 2,573 | 5,444 | 6,057 | 5,088 | 8,028 | 11,353 | 9,615 | 14,591 | 13,379 | 11,922 |
| Year-over-year growth in CFO | NA | +112% | +11% | −16% | +57% | +41% | −15% | +52% | −8% | −11% |
| Investment in PPE, net | 1,092 | 1,348 | 1,642 | 1,679 | 1,453 | 1,980 | 2,472 | 2,565 | 3,200 | 3,531 |
| Acquisitions, net of divestitures | NA | NA | 149 | 1,124 | 641 | 855 | 6,793 | 11,248 | 391 | 7,977 |
| Cash capital expenditures | 1,092 | 1,348 | 1,791 | 2,803 | 2,094 | 2,835 | 9,265 | 13,813 | 3,591 | 11,508 |
| Cash cap-ex as a % of CFO | 42.4% | 24.8% | 29.6% | 55.1% | 26.1% | 25.0% | 96.4% | 94.7% | 26.8% | 96.5% |
| Maintenance as a % of CFO | 42.4% | 24.8% | 27.1% | 33.0% | 18.1% | 17.4% | 25.7% | 17.6% | 23.9% | 29.6% |
| Free cash flow (FCF) | 1,481 | 4,096 | 4,266 | 2,285 | 5,934 | 8,518 | 2,822 | 778 | 9,788 | 414 |
| FCF with maintenance only | 1,481 | 4,096 | 4,415 | 3,409 | 6,575 | 9,373 | 7,143 | 12,026 | 10,179 | 8,391 |
| Average shares outstanding | 1,974 | 2,499 | 3,063 | 3,055 | 2,909 | 2,852 | 2,716 | 2,567 | 2,437 | 2,372 |

*Data Source:* SEC 10-K filings.

- HPQ has had significant management turnover in executive leadership over the past 10 years.
- HPQ has announced a number of strategic initiatives that present some uncertainties for shareholders.
- HPQ's software business is one of its highest-margin businesses.
- HPQ's Personal Systems Group is one of its lowest-margin businesses.

Although cash flow from operations did not move in a positive direction from 2008 to 2010, HPQ is not operating within a vacuum. Like many companies, HPQ has faced headwinds in the recessionary and slow-growth environment that followed 2008.

## Behavioral Biases and Evidence of Analyst Overreaction

While HPQ's management and strategy changes cannot be viewed as positives, I would note that in spite of *turmoil* at the top of the company over the past ten years, the company has continued to grow. Moreover, what is more important, as a potential investor, is the value inherent in the company's shares. To this end, while the current changes may not help the company grow, the larger question is whether the changes result in a contraction in operating cash flow. The company's share price has contracted significantly, so we must assess the likelihood that the announced changes are net negatives from an operating cash flow standpoint. I don't think that HPQ's history, a history that includes a fair amount of management turnover, reflects a company that traditionally contracts in all economic environments. As an analyst attempting to determine why HPQ has traded significantly lower in recent weeks, it may be worthwhile to consider a number of behavioral errors that investors may be collectively making in their assessment of the company's prospects. We can then determine if there are signs of such errors taking place. Assessing HPQ's recent operating performance and announcements, I see three avenues for behavioral errors to affect investor decision making:

1. **Representativeness:** Investors may be looking at HPQ's performance over the past three years, and viewing it as representative of what we can expect from HPQ over the long-term. A more encompassing examination of HPQ's track record belies this presumption.
2. **Representativeness:** Investors may be examining HPQ's executive turnover and lack of consistent direction, and concluding that this aspect

to the company's character is representative of the company as a whole. While management is very important, HPQ's size and product line diversity would indicate that the company is not as reliant on the CEO position as a smaller organization.

3. **Framing:** Investors may be framing the company as a personal computer maker, rather than a broadly diversified technology company with many higher margin businesses. This is framing along the lines discussed in Chapter 5 and pertains to the way in which "frame makers" influence valuation by way of industry categorization.

In short, while there will not be a sign affixed to the wall of the New York Stock Exchange indicating what behavioral factors may be affecting HPQ's stock, it is not difficult to see that given recent performance and company pronouncements, that some behavioral factors may be influencing investors' attitudes towards this issue. John Dvorak, in a commentary for MarketWatch .com,[1] sums up what I think the conventional thinking on HPQ is at the present time. In spite of a steep decline in HPQ's share price, he dismisses the value inherent in the company's common stock, noting that an "unsettled strategy and a revolving door installed at the top office does not bode well." In short, poor strategy equals poor stock . . . with no objective linkage to underlying valuation. Strategy and management represent HPQ's inherent value, in this view.

While a number of analysts lowered their price targets and rankings on HPQ, a research note from JP Morgan analyst Mark Moskowitz provides some very good examples of behavioral biases at work.[2] Moskowitz moved his price target for HPQ from $42 to $20, noting that he thinks "the 'value status' of HP's stock, given the historical low price-to-earnings multiple, is not an attractive one for investors. . . . There are few examples of value stories in large cap technology where high–profile turnarounds both worked and occurred in short order."

There are numerous potential behavioral biases that can be pointed to in Moskowitz's research note on HPQ. Not surprisingly, representativeness biases are prevalent as the analyst searches for a "few examples" on which to base a story. Moreover, notice that Moskowitz frames HPQ's prospects in terms of time, desiring a short time frame, but delinking potential return from said time frame. Also, is it simply due to revised modeling that Moskowitz now values HPQ at close to its share price at the time? Probably not. As I noted in Chapter 5, the professional analyst has many numbers upon which to anchor valuation. Recent prices are the most compelling anchors, and Moskowitz is

not alone in this error, with many analysts moving targets lower to prices that are not too far from recently established prices.

## Evaluating the Market's Assessment of HPQ's Growth Prospects

Our next step, having identified a company with compelling filtering metrics, and possible behavioral biases, is to try and determine whether the market's assessment of value is reasonable. To this end, we will examine forward prices within a matrix, as described in Chapter 9, intending to determine whether the market's assessment is reasonable or unreasonable. Again, while we ultimately may have a forecast estimate in mind for HPQ, we will attempt to take ourselves out of the forecasting business, and consider ourselves critics of others' predictions.

I'll start this analysis by making some simple assumptions. First, I'll assume that fiscal 2011 will end with very little in way of free cash flow. Indeed, I'll presume that free cash flow for the fourth quarter will be nil. Further, given that the company has historically spent approximately 52 percent of its free cash flow on capital expenditures, I'll make an adjustment to the company's trailing nine-month free cash flow to reflect the historical rate of capital expenditures. This isn't to say that I think the company will spend a given amount in a forward year, but rather, that we expect that the company will spend more in some years and less in others. The current year is running "light" on capital expenditures, especially from an acquisition standpoint. However, given the Autonomy Corp. purchase is expected to close in the current calendar year, at least some of this additional capital expenditure amount will go towards that purchase. But note that it will not fully cover the purchase amount, as the expectation is that some years will see smaller capital expenditure amounts and some years will see larger capital expenditure amounts. I could try and map out capital expenditures over the next 5 to 10 years, but this would probably provide little value, as I don't have a crystal ball that would give me any clarity. Still, given the recent purchases, and the company's track record of purchases, I think it's reasonable to expect that the company will continue to use a little more than half of its operating cash flow to support growth oriented acquisitions.

Given a starting cash flow from operations amount of $10.239 billion and capital expenditures (inclusive of average presumed acquisitions) of $5.324 billion, we start with a free cash flow amount of $4.915 billion. With this

starting free cash flow amount, the analyst must now decide on a discount model in order to value the equity or the firm. In the example that follows, I'll be using an adjusted present value (APV) model that values the firm using unlevered equity betas, and then backs out the value of debt, while adding an incremental amount for the tax benefits of the firm's debt. I generally prefer APV models, as they don't presume that the firm's proportion of debt remains the same forever. Models that make this assumption can provide results that are less than realistic for firms that are not inclined to keep a constant debt ratio. For more on APV models see Damodaran's *Investment Valuation*[3] or *Financial Markets and Corporate Strategy* by Mark Grinblatt and Sheridan Titman.[4] One could just as easily have used a traditional equity discounted cash flow model (using an equity cost of capital for a discount rate), or a firm discounted cash flow model (using a weighted average cost of capital for the discount rate). I like APV models, as I think they offer a cleaner examination of the firm's value and the value of carrying debt (the so-called tax shield). APV models don't work very well for firms with a tremendous amount of financial debt (such as banks and firms with significant financial services subsidiaries), as one would need to account for the risk of bankruptcy in one's calculation. HPQ's financial subsidiary is relatively small, so an APV models will work fine in this instance. Moreover, HPQ's debt levels are relatively small in relation to the firm's overall value (indeed, the firm's cash balance comes close to equaling its long-term debt), so I am not going to address the risk of bankruptcy as a significant component to this valuation. As an APV model arrives at a value for the entire enterprise, and not simply the company's equity, we need to add back the interest expense (in 2011, the run rate for interest expense was an annual $392.0 million, net) to our free cash flow starting base, thus arriving at a starting free cash flow amount of $5.103 billion.

Recall formula 9.1 from Chapter 9, providing a five-year abnormal-growth period. For our valuation of HPQ, we will use a similar model, and then expand upon the values that we get to arrive at an examination of various per-share values, as we did in Table 9.4 for CSCO and Table 9.7 for AAPL. As was the case with formula 9.1 in Chapter 9, we will presume that HPQ is subject to a high-growth period and then a stable-growth period.

Note that our assumptions will include a starting free cash flow amount at time zero ($CF_0$) of $5.103 billion, as described above. We'll start with a beginning cash flow growth rate of 8.50 percent, as well as discount rates for each period (calculated in the appendix to this chapter). My stable-state growth rate will be 2.50 percent, which is relatively low in relation to expected U.S. gross domestic product (GDP) growth and global growth. In short, I think these are very conservative assumptions.

As an example, I'll create one target value using some simplified assumptions, and then I'll expand this same framework in order to look at a number of growth rates. My target value in this case is not what I would expect from the firm, but will instead be based on third-party estimates for growth. We use this target as a baseline to expand our analysis and determine what growth rates and growth durations are necessary in order to arrive at HPQ's current market value of $23 per share. Using the aforementioned assumptions, and formula 9.1, we get the following calculations and value for HPQ:

$$\text{Firm Value} = \frac{\$5{,}537}{(1+0.0597)^1} + \frac{\$6{,}007}{(1+0.0607)^2} + \frac{\$6{,}518}{(1+0.0617)^3} + \frac{\$7{,}072}{(1+0.0639)^4} + \frac{\$7{,}673}{(1+0.0669)^5} + \frac{\$7{,}865}{\frac{(0.089-0.0025)^6}{(1+0.0669)^6}}$$

$$\text{Firm Value} = \$5{,}225 + \$5{,}339 + \$5{,}446 + \$5{,}520 + \$5{,}551 + \$88{,}901$$

$$\text{Firm Value} = \$115{,}982$$

The firm's value, at almost $116 billion, is the value of the firm's assets and not the value of the firm's equity. To arrive at the value for a firm's equity, we need to deduct the firm's current debt, and add back the beneficial impact that the firm's debt has on the company's valuation (the tax shield). Finally, as we've completed this valuation using the gross debt amount, we will also add into our value the value of the HPQ's cash and marketable securities.

As of the end of HPQ's fiscal third quarter (in 2011), the firm had amassed long-term debt and other liabilities of $36.76 billion ($19.03 billion of long-term debt plus $17.73 billion in "Other Liabilities"). However, while servicing the firm's debt detracts cash that would normally flow to equity stakeholders, the deductibility of interest, for tax purposes, results in a lower overall impact on equity stakeholders' residual cash flow. The aggregated value of this tax benefit is called the "Tax Shield" and is equal to the firm's estimated tax rate ($T_C$) multiplied by the firm's overall debt (D), as shown in formula 10.1. For more on this calculation, see the aforementioned books by Damodaran and Grinblatt and Titman.

$$\text{Tax Shield} = T_c \times D \qquad 10.1$$

Between 2001 and 2010 HPQ's overall tax has ranged from 16.9 percent and 23.7 percent. Over the 10-year period, HPQ's tax rate has averaged 20.3 percent. Value Line predicts that the company's long-term tax burden will be

**TABLE 10.6** Equity Value

| HPQ Equity Valuation (in $million): | |
|---|---|
| HPQ asset value | $115,982 |
| Less: total debt | $36,761 |
| Plus: value of tax shield | $7,462 |
| Plus: balance sheet cash | $12,953 |
| HPQ equity value | $99,636 |

*Data Source:* Calculated and SEC 10-K filings.

22 percent, which is in line with large technology-firm peers. Given that our tax rate will have a beneficial impact on HPQ's overall equity value, I will use the lower average tax rate of 20.3 percent in order to calculate the tax shield. Given HPQ's overall debt of $36.76 billion, we can arrive at the aggregate value of the tax benefit as follows:

$$\text{Tax Shield} = 0.203 \times \$36{,}761 \text{ million}$$
$$\text{Tax Shield} = \$7{,}462 \text{ million}$$

Given the company's cash at the end of the fiscal third quarter was $12.95 billion we can proceed to calculating the firm's value of equity with the other components calculated above, as shown in Table 10.6.

As HPQ had diluted, weighted-average shares outstanding of 2.08 billion in the company's recently completed fiscal third quarter (ending July 31, 2011), we arrive at a per share equity value of $47.90 ($99,636 / 2,080).

While our value of $47.90 for HPQ's common stock is one data point to consider, I look at this computation as a starting point in evaluating HPQ's current share price and prospects. Consider the array of values that we can compute, if we change certain assumptions in our model. As noted in Chapter 9, our short-term growth rate and the duration of our abnormal growth period, both have a profound impact on our intrinsic value computation. If we do a number of iterations using the same assumptions used in our analysis above, but varying the growth rate and duration, we can arrive at a matrix of values to consider with regard to HPQ, as shown in Table 10.7.

As was explained in Chapter 9, one reads this matrix by selecting two underlying assumptions, the abnormal growth amount and the length of the abnormal growth period. For example, if we believe that HPQ's free cash flow will contract at a compounded rate of 2.5 percent per year for 10 years then our resulting per share intrinsic value would be $21.85—fairly close the current valuation. However, if we believe that HPQ will growth its cash flow at a rate of 2.5 percent for a five-year period (and then settle into a

**TABLE 10.7** HPQ Estimated Per-Share Intrinsic Value, as of September 9, 2011, under Various Scenarios

| | Abnormal Growth Period in Years | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years | 6 Years | 7 Years | 8 Years | 9 Years | 10 Years |
| –2.5% | 30.55 | 29.67 | 38.80 | 27.82 | 26.71 | 25.67 | 24.65 | 23.67 | 22.67 | 21.85 |
| –1.5% | 30.94 | 30.42 | 29.87 | 29.17 | 28.30 | 27.46 | 26.62 | 25.78 | 24.89 | 24.16 |
| –0.5% | 31.34 | 31.18 | 30.97 | 30.56 | 29.95 | 29.35 | 28.70 | 28.03 | 27.26 | 26.66 |
| 0.5% | 31.73 | 31.94 | 32.08 | 31.99 | 31.67 | 31.32 | 30.89 | 30.42 | 29.82 | 29.36 |
| 1.5% | 32.13 | 32.72 | 33.21 | 33.47 | 33.45 | 33.38 | 33.21 | 32.97 | 32.56 | 32.29 |
| 2.5% | 32.52 | 33.50 | 34.37 | 34.98 | 35.29 | 35.54 | 35.66 | 35.68 | 35.50 | 35.45 |
| 3.5% | 32.91 | 34.29 | 35.55 | 36.54 | 37.21 | 37.80 | 38.24 | 38.57 | 38.66 | 38.87 |
| 4.5% | 33.31 | 35.08 | 36.75 | 38.14 | 39.20 | 40.16 | 40.97 | 41.64 | 42.04 | 42.57 |
| 5.5% | 33.70 | 35.88 | 37.97 | 39.78 | 41.26 | 42.64 | 43.85 | 44.90 | 45.67 | 46.57 |
| 6.5% | 34.10 | 36.69 | 39.22 | 41.48 | 43.40 | 45.22 | 46.88 | 48.37 | 49.56 | 50.89 |
| 7.5% | 34.49 | 37.51 | 40.48 | 43.21 | 45.61 | 47.93 | 50.07 | 52.06 | 53.73 | 55.55 |
| 8.5% | 34.88 | 38.33 | 41.78 | 45.00 | 47.90 | 50.75 | 53.44 | 55.98 | 58.19 | 60.58 |

steady-state growth rate of 2.5 percent), then our resulting intrinsic value would be $35.29.

Our resulting intrinsic values (the original $47.90, resulting from an 8.5 percent abnormal growth rate and a five-year abnormal growth period, or the $21.85 per share value resulting from a −2.5 percent abnormal growth rate and a 10-year abnormal growth period) are point-in-time estimates. They're what we've determined the company is worth *today*, given the *assumptions* that we've used in our valuation model. While many analysts will note that they expect that a company will reach a target price of a certain amount within a certain period of time, our intrinsic value computation is a point in time estimate of the company's value. The point in time is *today*. When do I think HPQ will reach a price of $47.90? I have no idea. Over time, I do believe that market values trend toward intrinsic value. However, those forces (as noted previously, primarily behavioral forces) that create investment opportunities in large capitalization stocks do not offer firm time frames for such inefficiencies to be rectified.

It should be noted that since 2001, HPQ has grown its cash flow from operations at a compounded rate of in excess of 18.5 percent, from $2.573 billion to $11.922 billion. Value Line, a third-party data provider and common stock research firm expects HPQ to grow its earnings at a rate of 8.5 percent (the "Projected EPS Growth Rate") and the Reuters Consensus Estimate for Long-Term Growth was 8.1 percent. Moreover, Gartner, the respected information technology research and advisory firm, expects that overall information technology spending will grow at a compound annual rate of 4.8 percent[1] to 2014. As HPQ is involved in many segments of the information technology industry, the Gartner estimate is a legitimate point to consider. However, note that Gartner's estimate pertains to top-line growth rather than bottom line growth. If HPQ is able to maintain their market share, they should be able to grow free cash flow per share at a rate that exceeds Gartner's estimates—due to a both share count reductions and operational leverage.

In addition, we can calculate the theoretical growth rate, based upon the company's average return on equity and average cash retention ratio, using the information found in Tables 10.1 and 10.8.

Recall from earlier in the chapter that HPQ has generated an average return on equity over the past 10 years of 14.8 percent. Given an average modified retention rate over the past 10 years of 47.7 percent, HPQ's theoretical growth rate ($g_A$), using formula 9.6 from Chapter 9, would be as follows:

$$\text{Theoretical Growth Rate } (g_A) = 47.7 \text{ percent} \times 14.8 \text{ percent}$$
$$\text{Theoretical Growth Rate } (g_A) = 7.1 \text{ percent}$$

**TABLE 10.8** HPQ Theoretical Cash Flow Growth Rate ($ in millions, except % as indicated)

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cash flows from operations | 2,573 | 5,444 | 6,057 | 5,088 | 8,028 | 11,353 | 9,615 | 14,591 | 13,379 | 11,922 |
| Cash dividends paid | 621 | 801 | 977 | 972 | 926 | 894 | 846 | 796 | 766 | 771 |
| Share repurchases, net | 886 | 294 | 269 | 2,739 | 2,353 | 5,241 | 7,784 | 7,810 | 3,303 | 8,425 |
| Cash flow to equity holders | 1,507 | 1,095 | 1,246 | 3,711 | 3,279 | 6,135 | 8,630 | 8,606 | 4,069 | 9,196 |
| Modified payout ratio | 58.6% | 20.1% | 20.6% | 72.9% | 40.8% | 54.0% | 89.8% | 59.0% | 30.4% | 77.1% |
| Modified retention rate | 41.4% | 79.9% | 79.4% | 27.1% | 59.2% | 46.0% | 10.2% | 41.0% | 69.6% | 22.9% |

*Data Source:* Calculated and SEC 10-K filings.

Note that these same calculations done over a five-year period would have resulted in a theoretical growth rate of 7.3 percent, while a three-year averaging period would have resulted in a 9.2 percent rate. Near-term results have been relatively good, and returns on equity in the past few years have been much stronger than in the years at the start of the decade. As the Reuter's consensus estimate and the Value Line long-term growth expectation are between these three-year and five-year averages, it could be that analysts are giving greater weight to near-term years. A 7 percent or 8 percent abnormal growth rate is reasonable given third-party estimates, HPQ's historical results and the theoretical growth estimate that one derives from the company's ROE and retention ratio. Before we pull all of this information together, I do think it's worth exploring one more element to valuation that was only discussed briefly in Chapter 9.

There is a third major assumption that I think one needs to consider in valuation, one that is very germane to the current low interest rate environment. In our valuation model, as was discussed in Chapter 9, much of our value results from the long-term perpetuity. This long-term perpetuity is largely shaped by three factors:

1. The free cash flow amount used as a starting base.
2. The long-term growth rate.
3. The long-term discount rate.

While our long-term growth rate is limited by the long-term growth rates of the company's geographic markets, the other two assumptions have no real limitations. While I focused on the short-term growth rate that established the free cash flow amount used as a starting base, I've not said as much about the long-term discount rate. This rate is built off of a long-term risk free rate and the presumed risk of the company. However, while we generally approach the calculation of this rate as one of a number of fairly simple assumptions, long-term risk-free rates can have very significant affects on both our intrinsic value computations as well as market values. Low interest rates are generally considered beneficial for stocks, as interest-oriented investments compete with common stocks on a return per unit of risk basis. Thus, lower forward return expectations, as conveyed by interest rates, make common stocks look more appealing, all other things being equal. Moreover, as risk-free rates serve as a building block for discount rates, lower rates directly increase the value of future cash flows. We can see this in the various models we build for valuation purposes. When interest rates move significantly higher, our valuation will come down, and indeed, stock prices react negatively to higher interest rates, or expectations for higher interest rates.

Still, it is a matter of magnitude and the duration of the time frame. Currently, our firm does not expect that long-term rates will rise significantly in the next couple of years. However, we do think it's important to model interest rate changes as part of our analysis. To this end, it may be interesting to look at the interplay between discount rate changes and short-term growth magnitude as part of our analysis. The matrix in Table 10.9 provides various prices given differing long-term discount rates and differing abnormal growth rates.

Currently, our long-term discount rate, included in our perpetuity is 8.90 percent. We can look however at what happens to the intrinsic value of HPQ, given upward and downward movements in this discount rate. Keep in mind that given the extraordinarily low interest rate environment, I've added an additional 2 percent to our risk free rate (as explained in the appendix to this chapter), under the assumption that low rates will not last forever. However, if I'm wrong and low rates last for a fairly long time period, a 6.90 percent rate may be more appropriate.

From an expectation standpoint, we would normally associate higher expected interest rates (and discount rates) with higher inflation expectations, which would infer higher growth rates (not for a specific company, but for the economy as a whole). Consequently, it would likely be erroneous to presume that rates are going higher, but there is not an effect on free cash flow, as the impetus for higher long-term rates, is usually an overheated economy (which is usually reflected in the company's recent growth rates).

## Pulling It All Together

So what do we have with HPQ? We have a company that, given fairly conservative assumptions, trades as though it is going to see free cash flow contract for a multiyear period. We have a company with a fair amount of executive turnover at the top. We have a diversified company with a business orientation but lower-margin consumer businesses as well.

But, given HPQ's track record of growth in free cash flow and cash flow from operations, I don't believe that an implied contraction is reasonable. Even zero-growth scenarios seem overly pessimistic, given HPQ's historical performance, business mix, and global footprint. Indeed, I don't think it's unreasonable to expect that HPQ will grow its free cash flow at a rate that approaches what I've described as its theoretical growth rate, or rates that approach Value Line's estimate or the consensus estimate. This would imply prices of between $35 per share and $50 per share, depending on one's

**TABLE 10.9** HPQ Estimated Per-Share Intrinsic Value, as of September 9, 2011, under Various Scenarios

| | Long-Term Discount Rates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6.90% | 7.40% | 7.90% | 8.40% | 8.90% | 9.40% | 9.90% | 10.40% | 10.90% | 11.40% |
| –2.5% | 38.10 | 34.38 | 31.35 | 28.83 | 26.71 | 24.90 | 23.33 | 21.96 | 20.75 | 19.68 |
| –1.5% | 40.28 | 36.37 | 33.18 | 30.53 | 28.30 | 26.39 | 24.74 | 23.30 | 22.03 | 20.90 |
| –0.5% | 42.55 | 38.44 | 35.09 | 32.30 | 29.95 | 27.94 | 26.21 | 24.69 | 23.35 | 22.17 |
| 0.5% | 44.91 | 40.59 | 37.06 | 34.14 | 31.67 | 29.56 | 27.73 | 26.13 | 24.73 | 23.48 |
| 1.5% | 47.37 | 42.82 | 39.12 | 36.04 | 33.45 | 31.23 | 29.31 | 27.63 | 26.16 | 24.85 |
| 2.5% | 49.91 | 45.14 | 41.25 | 38.02 | 35.29 | 32.96 | 30.95 | 29.19 | 27.64 | 26.26 |
| 3.5% | 52.56 | 47.55 | 43.46 | 40.07 | 37.21 | 34.76 | 32.65 | 30.80 | 29.17 | 27.73 |
| 4.5% | 55.30 | 50.04 | 45.76 | 42.20 | 39.20 | 36.63 | 34.41 | 32.47 | 30.76 | 29.25 |
| 5.5% | 58.15 | 52.63 | 48.14 | 44.41 | 41.26 | 38.57 | 36.24 | 34.21 | 32.41 | 30.82 |
| 6.5% | 61.10 | 55.32 | 50.61 | 46.70 | 43.40 | 40.57 | 38.13 | 36.00 | 34.12 | 32.46 |
| 7.5% | 64.16 | 58.10 | 53.17 | 49.07 | 45.61 | 42.65 | 40.09 | 37.86 | 35.89 | 34.15 |
| 8.5% | 67.33 | 60.99 | 55.82 | 51.52 | 47.90 | 44.80 | 42.13 | 39.79 | 37.73 | 35.90 |

expected abnormal growth duration. The important point however, is that HPQ's stock price is far from $35 per share. Thus, while one could argue over a target value, I find it difficult to argue that HPQ isn't undervalued.

Finally, I would also note that part of our valuation will be based on the near-term results for the broader global economy and the U.S. economy. While I don't think that a recession would detract from the undervalued nature of HPQ, I do think that a more robust recovery in employment could add upside to this issue's valuation. While it's unclear as to whether the U.S. economy (or global economy) is heading toward another recession, one could make the case that from a business cycle standpoint, HPQ is closer to the bottom than the top. Thus, the company may continue to grow at a fairly robust rate as it moves off of recessionary lows.

At Jones Villalta Asset Management we are looking at a near-term target of approximately $40 per share for HPQ, but we will reevaluate the company on a regular basis as the shares move higher. As strategic and management uncertainties are removed from consideration, we expect that HPQ's shares will move higher. Indeed, as a general rule, we expect that overpessimism will be replaced with reasonableness, which will then be replaced by overoptimism. We like to purchases investments when there is a fair amount of overpessimism, and sell investments when the tide turns toward overoptimism. While there is more to it than simply buying low and selling high, that is essentially what it ends up looking like.

## Appendix: Calculating Underlying Assumptions Relevant to the Valuation of HPQ

My emphasis in this book is on how behavioral factors shape underlying assumptions and resulting estimates of intrinsic value. While my focus throughout the last couple of chapters has been on our estimates of abnormal growth and the duration of the abnormal growth period, there are other assumptions that underlie our model. These assumptions can have a material impact on our underlying valuation, but they are less prone to behaviorally based errors in estimation and they are less sensitive to extreme overoptimism and overpessimism. While this case has been focused primarily on previously described areas of concern; for the sake of thoroughness, it is important that I describe my methods for calculating other inputs used in the valuation of HPQ in Chapter 10. I'll discuss my estimates for these inputs in this appendix.

## Calculation of Beta

In this model, I'm using an unlevered beta (β) statistic for purposes of constructing discount rates. This unlevered statistic will be computed using an average for a group of comparable firms. In using an average of comparable firms, I'm presuming that any individual beta statistic estimation errors are uncorrelated with other firms, and thus a comparable firm average will give me a statistic that will be less prone to error. While third-party data providers (such as Bloomberg, Morningstar, Standard & Poor's, and Value Line) provide beta statistics that have been adjusted to give a more accurate assessment of a company's risk, I still see value in using a comparable firm average for purposes of constructing discount rates. At the end of the day, however, I think this is a call that one can make and have little impact on underlying valuation. I'm more comfortable with comparable averages, but one will get similar results simply using a third-party service beta. The analysis that follows will start with the construction of a comparable group of companies and proceed with an estimation of risk based upon an average of this group.

I start by taking a group of companies that are similar in risk and market segment composition. While this type of analysis can be rather difficult for a diversified conglomerate, such as General Electric, business-oriented technology companies have more commonality. It's true that this is not a perfect group of companies and there are some companies in the group that follows that are only somewhat similar in composition, but by and large I don't think that the differences are significant enough to have a material impact on my discount rates or analysis. I attempt in this calculation to be as precise as one can be, but there is always going to be a fair amount of imprecision to this type of analysis.

My risk group is as follows: IBM, Oracle Corporation, Hewlett-Packard Company, EMC Corporation, and Dell Inc. EMC Corporation and Oracle Corporation are questionable comparables, as neither has a significant service business, and each has a greater proportion of their income coming from a particular segment (in the case of EMC Corporation, this segment is storage hardware, while in the case of Oracle Corporation, this segment is software). Still, all five of these companies are affected by significant changes in business spending, so I think they are a fairly good comparable group for purposes of assessing the risk of HPQ. One could argue that I would be better served by finding beta statistics for each of HPQ's different operating segments and then creating a weighted average beta based on the proportion of operating income derived from the differing operating segments. This would be

academically more precise, and I will admit that it would give me a better underlying assessment of the company's risk. As a practitioner, I think my research time is better spent on other components to assessing the value in a given company. Moreover, while it might be beneficial to use smaller-capitalization stock betas as pure-segment betas for components to a weighted average beta for a mid- to large-capitalization stock such as HPQ, the stability that is inherent in a larger enterprise would be lost in the weighted average. This large-technology-company stability would need to be reckoned with in a different manner (there is stability value to having a diversified product base). In my view, a better sense of risk is gleaned from having comparably sized companies with equally diversified product lines, but similar economic pressure points. Consequently, you will find that while I include in my analysis of HPQ companies such as IBM and Oracle Corporation, I'm not including Apple Inc.—even though HPQ may compete with Apple in some product segments. Apple's business is much more consumer oriented, while HPQ is less consumer oriented.

Beta statistics procured from Value Line are levered betas that reflect the risk of the equity in the firm. Since different firms have different levels of leverage, simply using an average beta from betas procured from a third party for various comparable firms is inaccurate. The more appropriate manner in which to arrive at an average beta is to delever the equity betas, and then calculate an average of the unlevered-firm betas. If we were using an equity discounted cash flow model, then we would relever (using the firm in question's debt-to-equity ratio) the average unlevered beta to arrive at a beta to use in a capital asset pricing model. For our APV model, we will use an unlevered beta. To calculate an unlevered asset beta ($\beta_{UL}$), we take a standard equity beta ($\beta_L$) and divide it by a function of the firm's tax rate (t) and its debt (D) to market equity (E) ratio, as shown in formula 10A.1.

$$\beta_{UL} = \frac{\beta_L}{1 + (1 - t) \times (D/E)} \qquad 10A.1$$

The calculations for our comparable firms are provided in Table 10A.1, along with the values for each of the underlying attributes to the calculation.

In calculating our discount rates, we will use a beta of 0.84. This is well above HPQ's unlevered beta of 0.75, and is consequently a more conservative assessment of the company's risk. With our unlevered asset beta calculated, we are now ready to turn our attention to the calculation of discount rates.

**TABLE 10A.1** HPQ Peer Group for Beta Calculations

| | $\beta_L$ | Long-Term Debt | Market Capitalization | Tax Rate | Lt Debt / Equity | $\beta_{UL}$ |
|---|---|---|---|---|---|---|
| IBM | 0.85 | $21,846 | $203,135 | 24.79% | 0.11 | 0.79 |
| Oracle Corporation | 0.95 | $14,772 | $146,719 | 25.34% | 0.10 | 0.88 |
| EMC Corporation | 0.95 | $235 | $46,854 | 24.48% | 0.01 | 0.95 |
| Hewlett-Packard | 0.95 | $15,258 | $46,587 | 20.17% | 0.33 | 0.75 |
| Dell Incorporated | 0.95 | $5,146 | $27,915 | 21.34% | 0.18 | 0.83 |
| Comparable Average | | | | | | 0.84 |

*Data Source:* Value Line Investment Analyzer and calculated.

## Discount Rates

Using our unlevered betas, we can proceed with calculating discount rates using the capital asset pricing model. For the risk-free rate I'm using the yield-to-maturity for U.S. Treasury bond and U.S. Treasury note stripped interest and principal payments. U.S. Treasury strips, in my opinion, provide a more accurate assessment of the risk-free rate at any point in time. Moreover, we calculate a discount rate for each period we are discounting, and then a long-term rate to be applied to our perpetuity. Note that at the time of this analysis interest rates are at extraordinarily low levels. This is not as risky as it would seem. As was discussed in the last chapter, much of our underlying value comes from the intrinsic value inherent in the perpetuity. The perpetuity will be based upon a 30-year risk-free rate, which is impacted less by short-term rates. While the U.S. Federal Reserve has some control over short-term rates, the effect on long-term rates is less significant. Certainly, there has been a downward movement, but the drop has been less steep than the drop on the short end of the yield curve. Still, in a nod to conservatism, I'm going to add 2 percent to my risk-free rates in calculating my discount rates. This will provide some cushion, should interest rates change abruptly during my holding period (which at the present time is not an extreme assumption). Using a 4.5 percent equity risk premium, I arrive at my discount rates, which are provided in Table 10A.2.

With these discount rates, the abnormal growth rates ($g_A$) discussed in this chapter, as well as the free cash flow starting amount ($CF_0$), we can use a valuation model to arrive at an estimate of intrinsic value.

**TABLE 10A.2** HPQ Discount Rate Calculations

| | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year | 8-Year | 9-Year | 10-Year | 30-Year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Risk-free rate + 2% | 2.19% | 2.29% | 2.39% | 2.61% | 2.91% | 3.14% | 3.36% | 3.57% | 3.82% | 3.97% | 5.12% |
| Equity risk premium | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% | 4.50% |
| Discount rate | 5.97% | 6.07% | 6.17% | 6.39% | 6.69% | 6.92% | 7.14% | 7.35% | 7.60% | 7.75% | 8.90% |

*Data Source:* wsj.com and calculated.

## Notes

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*The Large-Cap Portfolio: Value Investing and the Hidden Opportunity in Big Company Stocks*
by Thomas Villalta


CHAPTER 11

# The Challenges of Managing Large-Cap Common Stock Portfolios

Just as there are a number of challenges in managing small-capitalization stock portfolios, there are a number of challenges in managing large-capitalization stock portfolios. In general, some of the more mechanical issues that small-capitalization stock portfolios face are irrelevant in the case of large-cap portfolios. Liquidity is generally less of an issue when it comes to purchases and sales. In addition, one generally is not faced with the agency issues that accompany control positions in public companies. When a portfolio manager charged with managing a very large small-capitalization stock portfolio is purchasing outstanding shares of a company, a position size that is small for the manager's portfolio may constitute a very large proportion of the outstanding shares of the company. In some cases, the manager may essentially control the public company, if it owns a sizable enough position in the company. This is generally not an issue for domestic mid- to large-cap or large-cap stock portfolios, as the companies are sufficiently large to allow for more sizable holdings without essentially taking control of the company. Indeed, one's portfolio can grow quite large before issues concerning liquidity and issues concerning company control become sufficiently problematic to inhibit the management of the portfolio. Lastly, the bid and ask spreads for most mid- to large-capitalization stocks are relatively small compared to small

and micro-cap stocks. Entry into a position and exit from a position can be done with very little direct and indirect costs attached to transactions.

The issues that prove to be problematic for the active, domestic mid- to large-cap portfolio manager are more difficult to overcome. They generally are not of a structural nature. The mid- to large-cap portfolio manager's problems are not solved by having a robust and experienced trading desk. Nor are they solved by "asset limiting" the strategy. The problems that domestic mid- to large-cap portfolio managers face are generally related to portfolio management and process.

This chapter is about two interrelated portfolio management issues:

1. Given that investors always have the option of utilizing one of hundreds of passive strategies at a far lower cost, the manager of a large-cap portfolio needs to be aware of their benchmark.
2. The active manager needs to structure their portfolio management strategy to add value and create an actively managed portfolio of common stocks, as opposed to a closet index.

Being benchmark aware does not mean in this context shaping one's portfolio to look like their benchmark, but rather ensuring that one's portfolio management moves can add value.

This chapter will start with a discussion of the importance to the large-cap manager of understanding their universe and benchmark. Next, I'll discuss three interrelated issues faced by the large-cap portfolio manager: off-benchmark securities, position sizing, and turnover. All three of these issues relate to the concentrated nature of large-cap benchmarks, and pose problems for those facing relative comparisons. Then I'll turn to a discussion of commodity-oriented firms and the dilemma the large-cap manager faces in analyzing such firms and avoiding such firms from a portfolio management perspective. I'll end the chapter with a discussion of macroeconomic forecasting and its relevance to the large-cap portfolio.

## Understand Your Universe and Benchmark

There are managers who will explain that they don't have a benchmark, or benchmarks are irrelevant given their strategy. Still more will explain that they are "absolute return managers"; thus, you should be concerned with their absolute return and not their relative return.

This is generally nonsense. The active manager's competition in all cases is the passive alternative that the investor can choose to utilize for a given exposure. More often than not, managers who describe themselves as "absolute return" managers are simply managers who don't want to be benchmarked. It may be that they are not adding a great deal of value above the appropriate benchmark, or it may be that benchmarking them opens them up to greater scrutiny.

Benchmarking is a difficult task. In truth, a benchmark should comprise the opportunity set from which the manager selects. In practice, this is generally difficult if not impossible to achieve, given that benchmarks change and one's holding time period may overlap with a change in the benchmark. However, this is not to say that we shouldn't try to find a reasonable benchmark. If one is selecting from a universe of the 1,000 largest companies in the United States, the Russell 1000 Index is an appropriate benchmark, as it represents the 1,000 largest companies in the United States. The Russell 1000 benchmark is "reconstituted" on an annual basis on May 31 of each year. This means that a simple ranking of the 1,000 largest U.S. common stocks on any given date will probably not accurately represent the Russell 1000 Index on that date, since any company's market capitalization will change from day to day. Still, it probably will not be too far off, as the index is market-capitalization weighted, so the smallest companies that may change from day to day have a very minor effect on the benchmark's performance.

Also, as was explained in Chapter 1, the market-capitalization weighting of benchmarks means that the largest companies within a benchmark have a larger effect on the performance of the benchmark than the smallest companies. This characteristic causes different benchmarks representative of large-cap or mid- to large-cap stocks to move in a similar manner. For example, the year-to-year returns for both the Russell 1000 Index and the Standard & Poor's (S&P) 500 Index are very similar, as shown in Table 11.1.

The performance difference between the S&P 500 Index and the Russell 1000 Index is relatively small for active manager comparison purposes, and

**TABLE 11.1** Index Performance through December 2011

| | 1-Year | 3-Year | 5-Year |
|---|---|---|---|
| S&P 500 Index (total return): | 2.11% | 14.11% | −0.25% |
| Russell 1000 Index (total return): | 1.50 | 14.81 | −0.02 |

*Index Source:* Russell Investments and Standard and Poor's.

narrows with time. These two benchmarks tend to move in similar amounts on a day-to-day basis as well. This is in spite of the fact that the Russell 1000 Index tracks the performance of 1,000 common stocks, while the S&P 500 Index tracks the performance of 500 common stocks. The largest companies in each of these benchmarks drive the underlying returns of both benchmarks. The 100 largest companies (20 percent of the 500 companies) in the S&P 500 Index comprise approximately 64 percent of the total benchmark, while the 100 largest companies (10 percent of the 1,000 companies) in the Russell 1000 Index represent approximately 56 percent of the Russell 1000 Index. Similarly, as Table 11.2 reveals, the top 10 holdings of the Russell 1000 Index are the same as the top 10 holdings in the S&P 500 Index.

These holdings comprise 18.03 percent of the Russell 1000 Index and 20.23 percent of the S&P 500 Index. In short, the top holdings in large-cap benchmarks drive the performance of these benchmarks. This can be a positive or negative characteristic, depending on how various parts of the market are performing and where one is finding opportunities in their universe.

At our firm, we select stocks from a universe of the 1,000 largest companies in the United States, so the Russell 1000 Index is the most appropriate benchmark for comparative purposes. However, we do often use the S&P 500 Index as a comparable benchmark, as it's a very recognizable benchmark.

**TABLE 11.2** Top 10 Position Weights in Two Large-Cap Benchmarks

| Russel 1000 Index | | S&P 500 Index | |
|---|---|---|---|
| | Index Weight | | Index Weight |
| Exxon Mobil Corp. | 3.24% | Exxon Mobil Corp. | 3.57% |
| Apple Inc. | 2.90 | Apple Inc. | 3.31 |
| IBM | 1.73 | IBM | 1.90 |
| Chevron Corp. | 1.66 | Chevron Corp. | 1.86 |
| Microsoft Corp. | 1.49 | Microsoft Corp. | 1.71 |
| General Electric Company | 1.47 | General Electric Company | 1.66 |
| Procter & Gamble Co. | 1.44 | Procter & Gamble Co. | 1.61 |
| Johnson & Johnson | 1.39 | Johnson & Johnson | 1.57 |
| AT&T | 1.39 | AT&T | 1.57 |
| Pfizer Inc. | 1.32 | Pfizer Inc. | 1.46 |

*Index Source:* Standard & Poor's & Russell Investments Data as of December 30, 2011.

The performance of the Russell 1000 Index and the performance of the S&P 500 Index are similar enough to make any distinction immaterial.

I would note, however, that this is a peculiarity of mid- to large-cap benchmarks. The differences between small-cap benchmarks and even mid-cap benchmarks can vary dramatically from benchmark to benchmark. This is primarily due to the more diversified nature of these benchmarks. The largest stock in the Russell 2000 Index comprises 0.33 percent of the index, and the 10 largest holdings in the Russell 2000 Index comprise only 2.75 percent of the index. Similarly, as can be seen in Table 11.3, the largest holding in the S&P SmallCap 600 Index comprises only 0.80 percent of the index, while the top 10 holdings comprise only 5.81 percent of the index. Also, notice that there is significantly less commonality between the top 10 holdings in each benchmark with only three stocks falling into the top 10 of both indices.

While both the Russell 2000 Index and the S&P SmallCap 600 Index are small-capitalization benchmarks, they will perform very differently from each other. Moreover, note that the S&P SmallCap 600 benchmark has 100

**TABLE 11.3** Top 10 Position Weights in Two Small-Cap Benchmarks

| Russell 2000 Index | | S&P Small-Cap 600 Index | |
|---|---|---|---|
| | Index Weight | | Index Weight |
| Healthspring Inc. | 0.33% | Healthspring Inc. | 0.80% |
| NetLogic Microsystems Inc. | 0.31 | Salix Pharmaceuticals | 0.62 |
| SuccessFactors, Inc. | 0.30 | BioMed Realty Trust Inc. | 0.61 |
| Clean Harbors Inc. | 0.27 | Questcor Pharmaceuticals | 0.57 |
| World Fuel Services Corp. | 0.27 | Tanger Fact. Outlet Ctr. | 0.56 |
| Jack Henry & Associates | 0.26 | Piedmont Natural Gas Co. | 0.54 |
| American Campus Comm. | 0.26 | Cubist Pharmaceuticals Inc. | 0.53 |
| Salix Pharmaceuticals | 0.25 | ProAssurance Corp. | 0.53 |
| Onyx Pharmaceuticals Inc. | 0.25 | Delphi Financial Group | 0.53 |
| BioMed Realty Trust Inc. | 0.25 | Mid-America Apt. Comm. | 0.52 |

*Index Source:* Position weights for the Russell 2000 Index and S&P SmallCap 600 Index are based on security weights within iShares Russell 2000 Index Fund and iShares S&P SmallCap 600 Index Fund, both exchange-traded index funds. Data as of December 30, 2011.

more securities than the S&P 500 Index, yet the concentration among the top 10 is noticeably less.

Market-capitalization-weighted benchmarks present different challenges for the management of small-cap portfolios and large-cap portfolios. I'll discuss some of the challenges relating to large-cap portfolio management in the sections that follow.

## Off-Benchmark Securities

From a large-cap investor's standpoint, the decision between large-cap benchmarks is not too much of a concern and will have only a minor impact on representative comparisons for evaluation purposes. From my perspective, a larger issue for the large-cap manager is the use of off-benchmark securities. It is one thing to purchase a stock from a Russell 1000 universe and compare oneself to the S&P 500 Index; it is quite another thing to add commodity exchange-traded funds (ETFs) and bonds to a portfolio and still compare oneself to a large-cap benchmark. From a strategic standpoint, there are a number of things that a fund manager can do in order to seemingly add value from a performance standpoint and at the same time lower a fund's overall volatility. Some securities to consider with these intentions would include:

- Commodity ETFs
- International stocks
- Emerging-market stocks
- Bonds
- Small-cap stocks

Many of these investments are less correlated with a mid- to large-cap universe than off-benchmark securities that are still reasonably close in character to a mid- to large-cap benchmark. International stocks, in particular, give a portfolio manager an ability to diversify by issue selection, geopolitics, and currency. However, all of these additions to one's portfolio will lower the overall volatility of the portfolio and create superior risk-adjusted returns compared to the manager that stays relatively pure in relation to benchmarks.

For example, let's consider three investment universes, with return, standard deviation, and correlation characteristics as provided in Table 11.4.

Given that the primary universe for our hypothetical manager will be the "U.S. mid- to large-cap stocks" universe, the correlation of the other two

**TABLE 11.4** Asset-Class Risk, Return, and Correlation Assumptions

| | Expected Return | Expected Standard Deviation | Correlation to U.S. Mid- to Large-Cap Stocks |
|---|---|---|---|
| U.S. mid- to large-cap stocks | 8.75% | 15.75% | 1.00 |
| International stocks | 9.00% | 20.00% | 0.63 |
| Commodities | 8.00% | 30.00% | 0.13 |

**TABLE 11.5** Effect of Commodity and International Stock Exposures in U.S. Mid- to Large-Cap Portfolios

| | 100 | 95/5 | 90/5/5 | 85/10/5 | 80/15/5 | 75/20/5 |
|---|---|---|---|---|---|---|
| U.S. mid- to large-cap stocks | 100% | 95% | 90% | 85% | 80% | 75% |
| International stocks | 0% | 0% | 5% | 10% | 15% | 20% |
| Commodities | 0% | 5% | 5% | 5% | 5% | 5% |
| Expected return | 8.75% | 8.71% | 8.73% | 8.74% | 8.75% | 8.76% |
| Expected standard deviation | 15.75 | 15.23% | 15.09% | 15.00% | 14.94% | 14.93% |

investment universes to our primary universe will be a significant driver of the resulting portfolios' aggregate risk (by standard deviation). However, the "international stocks" universe and "commodities" universe have minimal correlation with each other as well (at 0.08). The return, standard deviation, and correlation data were based on actual returns for stock indices, which served as proxies for each universe. While these are not actual portfolios, we can see the benefits of adding less correlated investments to our primary universe, by combining incremental amounts of the international stocks universe and commodities universe with our primary investment pool, the U.S. mid- to large-cap stocks universe. Table 11.5 provides various allocations and risk and return data for a pure U.S. mid- to large-cap portfolio, as well as five *perverted* U.S. mid- to large-cap portfolios.

The portfolio designated "100" is comprised of a pure portfolio of domestic mid- to large-cap stocks. In other words, "100" doesn't contain off-benchmark securities. Portfolio "100" has an expected return of 8.75

percent and an expected standard deviation of 15.75 percent. Not surprisingly, this is the same expected return and expected standard deviation as the U.S. mid- to large-cap stocks" universe in Table 11.4. Portfolio "75/20/5" is a portfolio comprised of 75 percent U.S. mid- to large-cap stocks, 20 percent international stocks, and 5 percent commodities. Portfolio 75/20/5 is expected to provide a return 8.76 percent, with an expected standard deviation of 14.93 percent. Portfolio 75/20/5 shows the appeal of off-benchmark securities, as one can attain more return (or the same return) with less risk than the manager's primary universe (which in this case is represented by portfolio "100"). This, in a nutshell, is the appeal of off-benchmark securities. Finding off benchmark securities that are not correlated with the manager's principal universe will provide excess return with less risk or the same return with less risk—in spite of the off-benchmark securities' having significantly greater risk.

Still, this is not magic and the seemingly beneficial impact of off-benchmark securities is simply due to benchmark misspecification. Sophisticated consultants and fund evaluators will recognize these efforts and rebenchmark or account for the deviations from benchmarks in a manner that recognizes the benefits (generally accruing to the manager) of off-benchmark investments. However, for the professional investor who is allocating assets among different asset classes, off-benchmark securities represent a problematic element that will undermine the asset allocation process and introduce concentration risk into a seemingly diversified portfolio.

For these asset allocators, concentration risk is not an immaterial issue. Consider a manager that is largely invested in a particular subset of the market (say U.S. mid- to large-cap stocks) who is given the latitude to purchase material amounts of off-benchmark securities. Such a manager will always pose a problem for the asset allocator (a consultant, investment advisor, or institutional staff) who is dividing a large portfolio into separate disparate asset classes. Take, for example, the strategic asset allocation shown in Figure 11.1. This balanced portfolio is comprised of high-quality bonds, domestic mid- to large-cap stocks, domestic small-cap stocks, international stocks, commodities, and high-yield bonds.

If the manager selected to manage the domestic mid- to large-cap stock exposure within the asset allocation described in Figure 11.1 has significant latitude (as most mutual funds do), and decides to put 20 percent of their portfolio into international stocks and 5 percent of their portfolio into a gold ETF, then what do these portfolio management decisions portend for the underlying investor? In short, the domestic mid- to large-cap manager has altered the underlying investor's asset allocation, resulting in an effective allocation as shown in Figure 11.2.

**FIGURE 11.1** Example of an Investor's Strategic Asset Allocation

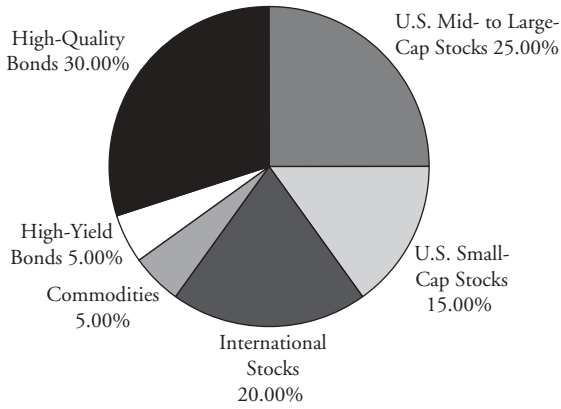
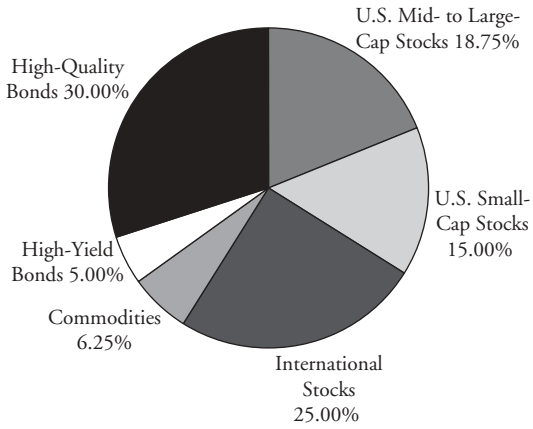



**FIGURE 11.2** Example of an Investor's Effective Asset Allocation




The effective allocation, whether successful or not from a performance standpoint, is significantly different than the strategic allocation, and will pose a different risk and return profile for the underlying investor. In short, the domestic mid- to large-cap manager has created three problems:

1. They've made themselves less easy to benchmark. This can be a major or minor problem from an evaluation standpoint.
2. The underlying investor's portfolio now is underweight U.S. mid- to large-cap stocks.
3. The underlying investor's portfolio is now overweight both commodities and international stocks.

More important are the underlying philosophies of the various managers used for the various asset-class exposures in the portfolio. If the domestic mid- to large-cap manager's strategy is momentum oriented and tends to follow the herd, they may be inadvertently increasing the underlying investor's total exposure to gold at a time when the commodity price is becoming more expensive. The strategic 5 percent commodity position (in Figure 11.1 above), that is separate from the position that has just been established in the domestic mid- to large-cap portfolio, may also be drawn, for the same reasons, to gold, and as a result gold is a significant proportion of the commodity portfolio. Indeed, if the managers used by an asset allocator have similar philosophies (growth, momentum, value, technical, etc.), then it's highly likely that one's overall exposure to similar assets will be growing significantly. This outcome would be consistent with the broader human tendency discussed in Chapter 6, which results in correlated mistakes. This is a very real concern for the advisor or consultant who is attempting to control the overall risk of the portfolio. Moreover, the investor (or consultant) is likely using benchmark returns as the basis for setting expectations with regard to total expected volatility and expected returns. By skewing the invested proportions with off-benchmark securities, the manager may be lowering *their* overall volatility, but increasing the underlying shareholders' overall volatility.

Similarly, processes that systematically avoid subsets of a benchmark may also increase concentration risk. Take, for example, a manager that draws investment ideas from a domestic mid- to large-cap universe (such as the Russell 1000), but rarely, if ever, purchases stocks that have market capitalizations that exceed $10 billion. In this case, the underlying investor is faced with a dilemma. While it's fair for the manager to select only domestic mid-cap stocks from a domestic mid- to large-cap universe, the underlying investor would need to determine if such a fund is meeting their asset allocation needs. It is one thing for a money manager, especially one that has a value orientation or a contrarian approach, to end up in one subset of the market (say a particular sector, or only mid-cap stocks) for a short-term or intermediate-term horizon. But if that manager never seems to find value outside of mid-cap stocks, then one should be questioning the manager's process and underlying investment criteria. Also, the underlying investor may wish to pair this manager with a passive strategy that gives them at least some exposure to the largest stocks, and leaves a lesser proportion of the underlying exposure up to an active manager's discretion.

While having less of a direct impact, the benchmarking issue is also a thorn that will always be problematic, whether the manager is generating very good absolute returns or not. Consider again the domestic mid- to large-cap

manager with investments in international stocks and gold. What do you benchmark such a manager to? The S&P 500 Index? No, that benchmark is insufficiently broad. The MSCI World Index? No, that benchmark has broad stock market exposure but no direct commodity exposure. In the end, the proper benchmark is probably a custom benchmark that is comprised of two or three benchmarks: a domestic mid- to large-cap benchmark, such as the Russell 1000 Index, an international index such as the MSCI EAFE Index, and a commodity index or gold index. One could set the proportion allocated to these three benchmarks at an amount that represents the maximum allowable exposures, or one could simply weight the three components according to the current investment in the three different types of securities.

In short, while I don't advocate doing so, a portfolio manager can decrease their relative volatility significantly by purchasing off-benchmark securities. These could be stocks, bonds, or commodity-linked ETFs. Indeed, the more off-benchmark securities that a portfolio manager purchases, the more likely the manager will produce better risk-adjusted returns over the long term.

Finally, don't confuse managing to a benchmark with maintaining an appropriate benchmark. These are two very different things. At Jones Villalta Asset Management we don't manage to a benchmark. We have high Active Share, we maintain position sizes that significantly exceed benchmark position sizes and we at times are very overweight a particular industry or sector. Still, we do have an appropriate benchmark. It is fully inclusive of our opportunity set and allows potential investors to evaluate us on an apples-to-apples basis.

## Position Sizes

In Chapter 1, I discussed Active Share[1] and its relevance in determining whether a fund or portfolio is truly active or a closet index. There are additional insights provided by Active Share, which directly relate to the large-cap portfolio manager's ability to properly size portfolio positions. Active Share calculations point to the importance of position size when it comes to the largest stocks in the domestic large-cap universe. Consider the market capitalization–based weightings for the 10 largest stocks and the 10 smallest stocks in the S&P 500 benchmark, as shown in Table 11.6.

One can overweight a position in Titanium Metals Corp. (TIE) by 2 percent by taking a 2.01 percent position in TIE. Investing in mid-capitalization stocks in a portfolio benchmarked to the S&P 500 Index will have a pronounced effect on performance (negatively or positively). In a diversified

**TABLE 11.6** Top 10 and Bottom 10 Position Weights in S&P 500 Index

| 10 Largest Stocks | | 10 Smallest Stocks | |
|---|---|---|---|
| | Index Weight | | Index Weight |
| ExxonMobil Corp. | 3.57% | E*Trade Financial Corp. | 0.02% |
| Apple Inc. | 3.31 | First Solar Inc. | 0.02 |
| IBM | 1.90 | Washington Post Company | 0.02 |
| Chevron Corp. | 1.86 | Compuware Corporation | 0.02 |
| Microsoft Corp. | 1.71 | Autonation Inc. | 0.02 |
| General Electric Company | 1.66 | SUPERVALU Inc. | 0.02 |
| Procter & Gamble Co. | 1.61 | Federated Investors Inc. | 0.01 |
| Johnson & Johnson | 1.57 | Titanium Metals Corp. | 0.01 |
| AT&T | 1.57 | Sears Holdings Corp. | 0.01 |
| Pfizer Inc. | 1.46 | Orchard Supply Hardware | <0.01 |

*Index Source:* Soure for bottom-10 holdings: Position weights for the bottom 10 holdings in the S&P 500 Index are based on security weights within iShares S&P 500 Index Fund, an exchange-traded index funds. Source for top-10 holdings: *Standard & Poor's.* Both as of December 30, 2011.

portfolio of common stocks, a 2.01 percent position is relatively minor, but could have a big impact. A position in ExxonMobil Corp. (XOM) is more difficult to size for the mid- to large-cap stock investor. XOM represented 3.57 percent of the S&P 500 Index in December of 2011. We can overweight this holding by 2 percent, taking a 5.57 percent position, but then the position will not only have a meaningful relative impact on performance, but pose diversification issues for an investor seeking to maintain a diversified portfolio.

In short, truly actively managed domestic mid- to large-cap portfolios must be relatively concentrated in some securities—specifically the largest securities in the benchmark. Not taking the risk that such concentration requires, makes mid- to large-cap portfolios devoid of significant value. This may not sit well with some investors, and those investors should probably be invested in a passive benchmark, rather than take this risk. To be opportunistic, which can be an excellent complement to a passive portfolio, one must take this risk. To what degree we overweight positions is, I suppose, debatable. Consider, however, that when we take a 2 percent position in a stock like TIE, we are taking a position that is 200 times as large as the benchmark position. I don't think a large-cap position that is twice as large as the benchmark position is out of bounds, although some portfolio managers may be uncomfortable with such a position. Note too that some portfolios, indeed most mutual funds, are limited, by Securities and Exchange Commission (SEC)

regulations to position sizes of no more than 5 percent at initial cost (this is for diversified funds, rather than nondiversified funds). Thus, regulations limit our underlying exposure to the largest handful of stocks in the domestic stock market to more modest multiples of benchmark position weights.

## Turnover

Portfolio turnover is another paramount issue for the mid- to large-cap investor. The position size issue noted earlier has an associated effect related to turnover. While turnover of mid-capitalization stocks within a portfolio benchmarked to the S&P 500 Index will not have a big impact on total relative performance (keep in mind that such stocks might be 0.05 percent to 0.01 percent of the benchmark), turnover in the largest securities will have a more pronounced impact. Note that while smaller stocks within a benchmark have a meaningful impact when one is invested in them but have a significantly less meaningful impact when one is not invested in them. For larger-capitalization issues, being out of a stock is often as meaningful as being in a stock. As I write this, ExxonMobil Corp. is the largest company within both the S&P 500 Index and Russell 1000 Index, representing a respective 3.57 percent and 3.24 percent of both of these benchmarks. Being invested in ExxonMobil Corp. at a position size that affects one's performance is a decisive portfolio management move. One has made a decisive call on ExxonMobil Corp.'s future share price. However, not being invested in ExxonMobil Corp., given the relative position size within the index, is also a decisive portfolio management move. I would go so far as to say that it is akin to shorting a mid-cap stock within each index, given the company's relative size within the indices. As a consequence of this dynamic, turnover of securities, especially given short-term underperformance, can have a much more meaningful impact on one's overall relative fund performance, if even a fraction of the downward movement is recouped in a reversion of overpessimism. In managing a mid- to large-cap portfolio, I would advise caution in assessing downward price movements in stock issues that one holds in their portfolio. While there are times when it is appropriate to sell "losers," note that if today's "losers" don't become tomorrow's "winners" but only win a fraction back, that fraction can have a meaningful impact.

Additionally, as was explained in Chapter 5, framing effects that are related to time horizons have a propensity to push an investor (professional or amateur) to take less risk.[2] Unlike other asset classes, such as small-cap stocks and international stocks, in the large-cap subset of the market, it's very

easy to "hug" a benchmark and move to positions that render active management ineffective. While time-horizon framing is a behavioral effect that can be present in any investment market, the ease with which a manager can move toward a benchmark-like position is unparalleled in the large-cap arena.

Still, a case can be made that turnover is *needed* in a portfolio, if only to counteract the insidious nature of *endowment* effects. The endowment effect was first identified and described by Richard Thaler in 1980, and relates to our general unwillingness to give up things (including common stocks) with which we have been "endowed."[3] At Jones Villalta Asset Management, we don't find turnover to be an issue—as it pertains to keeping long time horizons. We have low turnover, and sell only about 20 percent of our holdings on average in any given year. Given our proclivity for patience and the structure of our research process, we are more concerned that we are erring in our desire to maintain the status quo.[4] To counteract this we force ourselves to sell a holding at least once a quarter, whether or not any particular holding has reached a price target. This may seem to run counter to a value-oriented style of management, and I'll admit it's not perfect. However, humans have a tendency to rationalize away unreasonable assumptions, and we are largely seeking to avoid becoming too attached to a holding and falling victim to endowment effects.

## Commodity-Oriented Holdings in the Large-Cap Portfolio

From a portfolio management perspective, a separate problem exists in the case of commodity-oriented businesses. These problems straddle both analysis and portfolio management. Commodity-oriented firms will see improved operating results when commodity prices are high and deteriorating results when prices fall. However, as was discussed in Chapter 2, one can argue that as the price of an investment increases, the good becomes riskier, and as the price of an investment falls, it becomes less risky. Companies benefiting from high commodity prices are riskier than those that are contending with low commodity prices. From an equilibrium standpoint, the price for most commodities should trend towards the cost of extraction. However, while the forces of perfect competition will have a tendency to reverse significant upward and downward movements in commodity prices, the energy sector has proved to be a problematic area in recent years, with distortions owing to supply constraints and consumption taxes. Given the proportion of benchmark indices with a link to crude oil, it's worth considering this problem in terms of portfolio management and analysis.

The link between returns, growth, and underlying commodity prices can be found by examining the fortunes of ExxonMobil Corporation (XOM). XOM has obviously benefited (and suffered) from changes in crude oil prices. Moreover, we can see that the company's returns on equity are very much correlated with crude oil prices, as shown in Table 11.7.

Returns obviously move higher as crude oil prices move higher. Moreover, with a stable payout policy, growth will be estimated at a rate that is increasing as crude oil prices rise. Table 11.7 and Figure 11.3 show what we would intuitively suspect:

Higher Commodity Prices = Higher Revenues
= Higher Earnings = Higher ROE

This holds in general for current earnings and obviously is supported by historical results. However, the question the analyst is faced with is more difficult. What does the future hold? To determine the returns on equity going forward, the fundamental analyst is largely faced in this circumstance with holding a macroeconomic view on crude oil prices. While I wouldn't go so far as to say the past is irrelevant, it's relevance is of limited value in the case of energy-oriented firms. And, in general, the market appears to discount the uncertainty in pricing, by making these issues look very appealing as prices rise. At present, with crude oil prices relatively high, the expected returns on equity, in relation to a relative valuation metric (such as price to book) is very appealing for a number of crude oil-related firms.

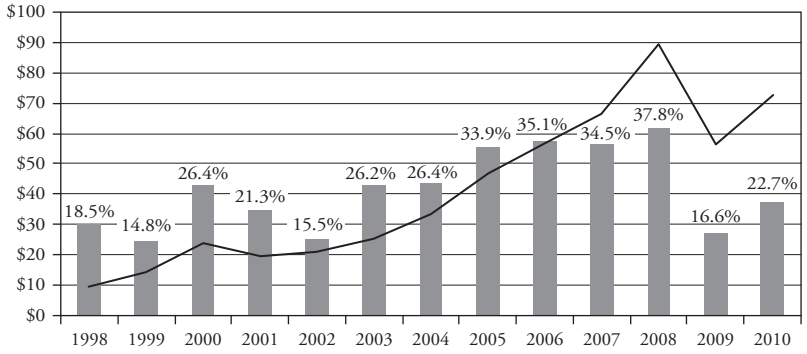
For a bottom-up, fundamental research process, crude oil–related issues will look very appealing at times that may represent risky entry points. Or maybe not. Crude oil is a very difficult commodity, as significant new finds appear to be diminishing. Also, as energy has become an increasingly significant weighting within the S&P 500, one's relative disadvantage in times of rising prices is significant. As noted previously, commodity prices, in general should approach the marginal costs of production (costs of extraction). However, in the case of crude oil, the relationship between prices and marginal costs appear to have delinked.

At the very least, the "work-around" solutions and alternatives to crude oil are very lagged from current pricing. At a point in the future, the price may collapse as higher prices will force many businesses and consumers to search for solutions to high energy costs. Unfortunately, the point in the future may be years away. In addition, both the national subsidization of derivative products (such as gasoline) and the taxation of derivative products

**TABLE 11.7** Annual Average Spot Prices, Returns on Equity, Payout Ratios, and Implied Growth

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| XOM's realized crude oil price | $21.10 | $22.30 | $26.66 | $34.76 | $48.23 | $58.34 | $67.89 | $90.96 | $57.86 | $74.04 |
| Returns on equity (ROEs): | 12.3% | 15.5% | 26.2% | 26.4% | 33.9% | 35.1% | 34.5% | 37.8% | 16.6% | 22.7% |
| Payout ratio (dividends): | 40.8% | 54.3% | 30.3% | 27.2% | 19.9% | 19.3% | 18.8% | 17.8% | 41.6% | 27.9% |
| Implied growth | 12.6% | 7.1% | 18.2% | 19.2% | 27.2% | 28.3% | 28.0% | 31.1% | 9.7% | 16.4% |

**FIGURE 11.3** XOM's Realized Price of Crude Oil ($/barrel) vs. ROE




are likely skewing crude oil demand at any given price, giving us a skewed view of supply and demand at current spot prices.

For the large-cap portfolio manager, I would like to say that the solution is to avoid commodity-oriented firms at high historical prices—especially when the pricing far exceeds the cost of extraction. As professional investors are always subject to relative comparisons, I'm not sure that this is the best solution. As was explained in Chapter 6, a manager's ability to add value and outperform broad market benchmarks such as the S&P 500 is predicated on keeping investors invested over long time horizons. Arbitrage (including taking long positions in undervalued common stocks) does not fail due to a lack of opportunities or a failure of prices to move towards reasonable assessments of value (intrinsic values). It fails because of the existence of interim periods. During these periods, prices can fall still further, or stocks that the manager has avoided can become even more overvalued. In the interim periods, underperformance of the manager's portfolio can cause an exodus of investors, or when leverage is used, margin calls. Keeping investors invested and taking advantage of long-horizon opportunities is difficult.

I should also point out that many other sectors of the economy are impacted negatively by higher crude oil pricing. Thus, as one is suffering on a relative basis from a dearth of oil-related issues in their portfolio, it is also likely that non-oil-related industries are also suffering. As a consequence, while I'm generally a contrarian when it comes to most commodities, we currently view our energy-related positions as a hedge. If crude oil prices move lower, most individuals will be better off, and the economy will likely grow at a faster rate. Our energy stocks will fall in value, but other stocks will likely do better. Of course, the reverse can be true as well.

It will be up to investors to determine if remaining out of the energy sector is the best option. For our own firm, we have devised heuristics that lend some objectivity to our use of energy as a hedge. It is our belief that the greatest obstacles to high crude oil prices are high crude oil prices themselves. At very high levels, high oil prices take a toll on consumption. At high pricing, the risk of economic contraction becomes more pronounced. While taxation, fuel economy and inflation will cause us to alter our heuristics, at the present time we feel the maximum pricing that the domestic economy can tolerate is between $130 and $150 per barrel. This will change as fuel economy changes, and when subsidies in emerging markets, such as China, are curtailed. However, given emerging market demand, we do think there is a floor to pricing as well. We think this figure is between $30 and $50 per barrel. We look to pare our energy holdings when prices exceed $130 per barrel. Alternatively, when prices are low (below $70) we will purchase increasing amounts of crude oil–related stocks (depending on their prices). This is hardly scientific, but is a reflection of our desire to not underperform our benchmark to too great a degree in any given period.

In 1999, we had invested in a number of crude oil-related production and service companies, as the price of crude oil was very low in the late 1990s.[5] In 2005, we sold off the last position we maintained in the energy sector, as prices had moved significantly higher over a multiyear period starting in 2000. Our sales of energy-related issues in 2005 proved to have been a very large mistake on a relative basis, as prices continued to move up in 2006, 2007, and 2008. As I discussed earlier in this chapter, a peculiarity of large-cap portfolios is that relative performance is predicated as much on what one *is not* invested in as it is on what one *is* invested in. The energy sector is and will likely continue to be a problematic area for us, as the valuation of companies within this industry is predicated on a view of crude oil prices that we simply are uncomfortable making. Still, we are holding our noses and maintain a position at the present time (in early 2012), even as prices are far above 2005 levels.

## Macroeconomics and Portfolio Management

While we discussed microeconomic factors in Chapter 9, one will note that this book really has nothing to say about macroeconomic factors. Much of this absence reflects the nature of valuation. Recall from Chapter 9 that in our valuation of a company, the preponderance of value is derived from a perpetuity of

infinite length. Indeed, as was shown in Figure 9.1, even if we are looking at an abnormal growth period that extends to 10 years in duration, over 60 percent of the value of the company is due to the value of discounted cash flows in the years that extend far into the future.

Because of the long-term nature of common stock valuation, events in the near term (one to three years forward) have only a modest impact on the underlying value of a company. A recession is but a blip in the time continuum that is valuation. Moreover, as has been discussed in earlier chapters, it is the near-term volatility that presents investment opportunities. The overreaction to near-term data, and the tendency on the part of individuals to overweight this near-term data in making decisions with regard to forward uncertainties, results in opportunities that the analyst can take advantage of.

Humankind's ability to predict near-term and intermediate-term macroeconomic trends is rather poor. Moreover, the ultimate benefit of macroeconomic forecasts is not clear, as we are less focused on first-order effects and more concerned with second- and third-order effects. Consider a portfolio manager's management decisions in light of a prediction that the global economy is headed into recession.

First, the portfolio manager must presume that they or others have the ability to forecast recessions accurately. In short, are we good at making macroeconomic forecasts? However, even if we presume we are good at making macroeconomic forecasts, the value of this information is not in the first order effect of an economic contraction. The question becomes: how does this economic forecast affect my individual portfolio holdings' short-term, intermediate-term and long-term earning ability? In truth, the long-term effects of a recession probably have only a minor effect on long-term earning ability, so the value of the prediction, in terms of valuation, is limited to the abnormal growth period (which, in this case, may show a contraction in cash flow).

Finally, the portfolio manager's overarching aim is to determine if a company is under-valued in relation to its growth prospects. Consequently, we may determine that a recession is on the horizon, and we may determine that this recession is going to have a pronounced impact on a particular company's near and intermediate term earnings. However, does this mean that the company's intrinsic value now falls short of its market value (or falls too close to its market value for us to deem the company a "value")?

Further, if a company's share price has fallen due to concerns that the economy is headed toward a recession, does our view of the company's intrinsic value change? In short, we are really faced with three different scenarios

in the case where our investment's value has fallen in response to concerns regarding economic uncertainty:

1. Our common stock holding's share price has fallen, but not enough to account for the effects of a recession. In this case, we should probably sell the stock.
2. Our common stock holding's share price has fallen, but the fall has been commensurate with the risk of recession, so while our estimate of intrinsic value has fallen, our expected return based on the company's lower share price and our lower intrinsic value is equal to the previous, pre-economic-concern expected return.
3. Our common stock holding's share price has fallen, and the fall has exceeded what we determine the recession's effect will be on the company's underlying intrinsic value. In other words, the fall has resulted in an even greater expected return for this common stock, as investors have approached the company's valuation with a fair amount of recession-related overpessimism.

Of course, all three of the scenarios above presume that we are able to accurately gauge the likelihood of recession and the magnitude of the recession's effects.

At the end of the day, we must always consider an investment a new investment. In other words, would I purchase the stock today, given the current share price and my estimate of intrinsic value? Stepping back and not letting a share price decline color one's assessment of a company's value is difficult. It is very easy to see a company's share price movement as *representative* of the company's value. The thinking is that *good* common stock investments don't behave *poorly*.

One's benchmark doesn't have this problem, as the benchmark doesn't sell a stock for behaving poorly, and a benchmark doesn't alter its constituents given economic forecasts. The benchmark takes a long-term view. This long-term view likely results in a beneficial long-term impact on the benchmark's returns. One must always keep in mind that we want to ultimately buy low and sell high, we don't want to buy high and sell low. One's benchmark doesn't sell high or buy low, but it certainly doesn't sell low and buy high. Thus, our advantage is that we can buy low and sell high, while our benchmark doesn't have this ability. However, when we buy high and sell low, a tendency that is largely the result of our own behavioral flaws, we allow the benchmark an advantage that it can accrue value from.

## Conclusions

While preceding chapters have sought to offer guidance on individual security selection, this chapter has focused on issues that are pertinent to managing a large-cap portfolio of common stocks. To this end, I've discussed the use of off-benchmark securities in altering the relative risk profile of a portfolio. I've also discussed position sizing and turnover for the large-cap portfolio, which are problems that are more unique to large-cap portfolios than to portfolios benchmarked to other subsets of the broader stock market. Given the concentrated nature of large-cap benchmarks—relative to other subsets of the domestic stock market—off-benchmark securities and position sizes are material issues for the large-cap manager. I've noted that being out of a very large stock in the domestic stock market itself has a meaningful impact on relative performance. In short, the stock that one *is not* invested in is as important as the stock that one *is* invested in. When it comes to the largest stocks in the domestic stock market, invested or not, one is making a deliberate call on the prospects for the company in question. Similarly, in this chapter, I discussed the problematic nature of commodity-oriented firms, and the difficulties one faces in analyzing these firms. While this section harkened back to Chapter 9's discussion of individual stock analysis, the underlying problem for the large-cap manager is of a portfolio management nature. Energy stocks in particular are very problematic, as they constitute a very large proportion of the underlying market. While one may be comfortable in critiquing the growth prospects for a large-cap company, the analysis of energy-oriented firms requires making a call on the pricing for crude oil. This is far different and introduces a number of challenges that have no clear solutions. I offered our firm's thoughts on approaching energy issues, but as I noted in the section, we are perverting our process in many regards in approaching energy stocks.

Actively managed large-cap investment portfolios are appropriate for all investors looking for large-cap investment exposure. However, this isn't to say that using actively managed portfolios singularly for a particular asset-class exposure is appealing to everyone. I recognize that benchmark risk is a significant risk for many investors and consultants. Benchmark risk is the risk that a money manager or mutual fund underperforms a passive benchmark over a given time period, opening up the consultant or institutional staff to charges of ineptitude. Given the challenges facing large-cap managers as well as the propensity for large-cap managers to manage portfolios in a closet-index manner as noted in Chapter 1, there is risk to undertaking the use of actively managed portfolios. However, as noted in Chapter 1, as more

investors increasingly put large-capitalization allocations into passive strategies there will be increasing opportunities for managers that have effective processes to capitalize on volatility.

At the end of the day, opportunities are available in the large-cap subset of the market. The question is whether investors have the patience and foresight to find the opportunities and capitalize on them. When we talk to advisors about our mid- to large-cap strategy, we recognize the appeal of passive strategies. While an actively managed portfolio can be an appropriate surrogate for an asset-class exposure, sometimes a more balanced approach is better for the client and the consultant. Pairing active strategies with passive strategies is a way to differentiate between different types of opportunities and risk. In the long run, there is value in actively managed portfolios of common stocks, but there is also value in keeping clients from "jumping ship" at exactly the wrong time.

As this book comes to a close, I hope the reader has come away with a sense of what to look for in building a large-cap portfolio of common stocks. Investing isn't easy and requires intelligent decision making, an objective understanding of behavioral biases, and a full understanding of one's opportunity set. Still, while there is much work to be done, there is value in the end. The opportunities to profit in the large-cap subset of the market are real and are there for the diligent and thoughtful analyst to exploit.

## Notes

1. K. J. M. Cremers and Antti Petajisto, "How Active Is Your Fund Manager? A New Measure That Predicts Performance," *Review of Financial Studies* 22(9) (2009): 3329–3365.
2. Richard Thaler, Amos Tversky, Daniel Kahneman, and Alan Schwartz, "The Effect of Myopia and Loss Aversion on Risk Taking: An Experimental Test," *Quarterly Journal of Economics* 112(2) (May 1997): 647–661.
3. Richard Thaler, "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization* 1 (1980): 43.
4. William Samuelson and Richard Zeckhauser, "Status Quo Bias in Decision Making," *Journal of Risk and Uncertainty* 1 (1988): 7–59.
5. www.eia.gov. According to the U.S. Energy Information Administration, the "Weekly All Countries Spot Price FOB Weighted by Estimated Export Volume" in dollars per barrel ranged between $9.31 and $24.64 per barrel for the whole of 1999.

# What's On the Companion Website

While this book has covered a broad topic area that offers some general guidance in approaching the analysis of large-capitalization common stocks and portfolios comprised of large-capitalization stocks, there are some specific methods that I referenced in Chapter 9 that are meant to aid the practitioner in assessing the implied growth rate inherent in the current pricing for any stock. By going to www.wiley.com/go/villalta (password: largecap), one can access a Microsoft Excel tool in order to create matrices based on two parameters to valuation. This tool is directly applicable to the content covered in Chapter 9 and the case study on Hewlett-Packard Company in Chapter 10.

# About the Author

**Thomas Villalta** is the chief investment officer for Jones Villalta Asset Management, LLC, a boutique investment advisory firm focused on the selection of domestic mid- to large-cap stocks and the management of domestic mid- to large-cap portfolios. He is also the lead portfolio manager for the Jones Villalta Opportunity Fund (JVOFX), an actively managed mutual fund comprised of domestic mid- to large-cap common stocks. With 20 years of investment advisory experience, Mr. Villalta also has taught a number of graduate and undergraduate classes, as an adjunct professor at St. Edward's University in Austin, Texas. Mr. Villalta earned a master of business administration degree from the McCombs School of Business at the University of Texas at Austin, and a bachelor of arts degree with majors in economics and English from the University of St. Thomas in St. Paul, Minnesota. He is a Chartered Financial Analyst, and a member of both the CFA Institute and the CFA Society of Austin. In addition to having appeared numerous times on CNBC, Fox Business, AOL Daily Finance, and TheStreet.com, Mr. Villalta has been quoted frequently in the *Wall Street Journal, Barron's, BusinessWeek, SmartMoney, MarketWatch, Forbes*, Reuters, Associated Press, CNN, and other media outlets. Mr. Villalta resides with his wife and two children in Austin, Texas.

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