CHAPTER 1

Desperately Seeking Alpha

Thus, if the earth were viewed from the planets, it would doubtless shine with the light of its own clouds, and its solid body would be almost hidden beneath the clouds. Thus, the belts of Jupiter are formed in the clouds of that planet, since they change their situation relative to one another, and the solid body of Jupiter is seen with greater difficulty through those clouds. And the bodies of comets must be much more hidden beneath their atmospheres, which are both deeper and thicker.

—Isaac Newton, The Principia

Before there was a Hubble Space Telescope, humans looked at the heavens with the naked eye. In awe they stood, transfixed for a moment wondering where it all came from. On the shoulders of giants like Newton, God installed a mind able to breach the walls of their confines to offer a glimmer of how things worked. Alpha is both a symbol and a term used to describe a variety of tangible things or concepts, but it always refers to the first or most significant occurrence of something. Although the alpha that everyone was seeking in Newton’s day was an understanding of the universe, the history of alpha seekers in the literal sense goes back millennia.

For instance, the Bible documents the Israelites’ investing in land; certainly the early years of their inhabiting Palestine were all about building orchards and vineyards and turning the land from desert and fallow to productive tilling. And of course as evil as it was, slave-traders made investments in ships and the necessary accoutrements for transporting human capital across the ocean. Though these examples are not purely alpha as we think of it today, it was indeed about making an investment, with an expected return as its end point.

Shift to the Netherlands of the 1630s, when an economic bubble formed around the price of newly introduced tulip bulbs. The price of tulip bulbs
escalated to dizzying heights before it collapsed, causing great shock to the economy. Alas, tulipmania demonstrates the human tendency to make an investment, with the idea of garnering a return. I believe it’s within the definition of being human that one wants to be able to trade labor, capital, or currency for a greater return. The only difference between any business activity and that of an investor purchasing a bundle of securities, representing pieces of a business, is that in the case of the investor, there is a benchmark. In a single business investment, in which the investor is the founder and all the capital is deployed in this business, the investor doesn’t usually consider making money above and beyond that of a benchmark. The business owner investor just maximizes profit alone; profit isn’t measured against a standard but is measured in an absolute sense.

In William Sharpe’s ideas about capital asset pricing model (CAPM), the benchmark is the market. However, it comes with a murky definition, usually left for investors to define for themselves. Firms such as Morningstar and Lipper have made a business of measuring portfolio managers’ returns versus their interpretation of what the appropriate benchmark, or market, is. People pay for this interpretation, and the evidence shows that, more than often, portfolio managers do not add value above that of their benchmark (Morningstar or Lipper’s definition). However, the fund is often classified incorrectly and a very inappropriate market benchmark is applied against which to measure the portfolio manager’s performance. For instance, commonly, the S&P 500 is the designated benchmark and the portfolio might be a large-cap growth fund while the S&P 500 is thought of as a core portfolio, showing neither growth nor value characteristics. Also, large-cap–value portfolios are often compared with the S&P 500. This puts the portfolio manager at a disadvantage, because the assigned Morningstar benchmark is not what the manager actually uses to measure risk against nor is it what the managers design their portfolios to outperform. Style matters. To say that portfolio managers do not add much value above the benchmark when one really means the S&P 500 is misleading, because it is entirely possible that professional managers are beating their benchmarks but not beating the S&P 500, because not every manager’s benchmark is the S&P.

To give you an example of benchmark misclassification, here is a partial list of funds that have core benchmarks listed as their main benchmark at Morningstar, although they actually have clear style bias:

**LARGE-CAP VALUE**

- Valley Forge Fund: VAFGX
- Gabelli Equity Income: GABEX
- PNC Large Cap Value: PLVAX
LARGE-CAP GROWTH
Fidelity Nasdaq Comp. Index: FNCMX
ETF Market Opportunity: ETFOX

SMALL-CAP VALUE
Fidelity Small Value: FCPVX
PNC Multi-Factor SCValue: PMRRX

Now Morningstar will also offer other information. For instance, Table 1.1 lists some mutual funds that have several categories of benchmarks listed. In particular, the prospectuses for these funds indicate the managers all compare themselves to the S&P 500, whereas Morningstar preferred to compare them to another benchmark. Then, regressions of the funds’ past 36-month returns were performed (month ending June 30, 2010) against a large group of benchmarks, and the subsequent $R^2$ of the regression is reported. The higher the $R^2$, the more variance of return is explained by the regression and the more alike the mutual fund’s return behavior has been to the modern portfolio theory (MPT) benchmark used in the regression. This demonstrates higher correspondence of return for some other benchmark rather than the one the managers measure themselves against or the one assigned by Morningstar.

In truth, there is nothing technically wrong with the reported numbers. However, it is misleading to investors for a couple of reasons. The first reason is that it violates the law of large numbers. For instance, if you regressed the S&P 100 index against a suite of benchmarks, say, 76 randomly selectedindexes using the past 36-month returns, it is highly likely that, for any given three-year-return time series, at least one of those benchmarks will have a higher correlation (and $R^2$) than with the S&P 500, with which it shares the top 100 stocks. This would be true for other indexes, too. So, if in that period of time the better fit for the S&P 100 is with the Russell 1000 Growth index, you would believe that there is a style bias to the S&P 100. That would be a completely crazy notion, however.

Table 1.1 shows a real-world example in which Fidelity Magellan (FMR) has a higher $R^2$ to Russell Midcap Growth index rather than the S&P 500. Now, does anybody really believe that the Fidelity Magellan fund is anything other than a large-cap fund that disregards style? It has been run that way since Peter Lynch was its manager. The S&P or Russell 1000 are Magellan’s benchmark simply by its claim in its prospectus that it “is not constrained by any particular investment style.” At any given time, FMR may tend to buy growth stocks or value stocks or a combination of both types. Hence, a fund’s benchmark is defined by the methodology employed in its stock
### Table 1.1: Morningstar Listed Mutual Funds with Questionable Benchmark Assignments

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>Ticker</th>
<th>Prospectus Benchmark</th>
<th>Morningstar Assigned Bench</th>
<th>MPT Benchmark</th>
<th>R² to S&amp;P 500</th>
<th>R² to best fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oakmark I</td>
<td>OAKMX</td>
<td>S&amp;P 500</td>
<td>Russell 1000</td>
<td>Morningstar Mid Value</td>
<td>96</td>
<td>93</td>
</tr>
<tr>
<td>Amana Trust Income</td>
<td>AMANX</td>
<td>S&amp;P 500</td>
<td>Russell 1000 Value</td>
<td>MSCI World NR</td>
<td>90</td>
<td>87</td>
</tr>
<tr>
<td>American Funds New Eco.</td>
<td>ANEFX</td>
<td>S&amp;P 500</td>
<td>Russell 1000 Growth</td>
<td>Morningstar Lifetime</td>
<td>95</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate 2050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yacktman Focused</td>
<td>YAFFX</td>
<td>S&amp;P 500</td>
<td>Russell 1000 Value</td>
<td>Morningstar Mid Value</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>Fidelity Magellan</td>
<td>FMAGX</td>
<td>S&amp;P 500</td>
<td>Russell 1000 Growth</td>
<td>Russell Midcap Growth</td>
<td>91</td>
<td>97</td>
</tr>
<tr>
<td>Sequoia</td>
<td>SEQUX</td>
<td>S&amp;P 500</td>
<td>Russell 1000</td>
<td>S&amp;P 1500 Cons</td>
<td>88</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Discretionary</td>
<td></td>
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</tbody>
</table>
selection strategy and portfolio construction process, not by some simple regression vs. returns.

In addition, given that the Morningstar style boxes (large, mid, small, growth, core or blend, value) are their own design, one would think they should know better than to compare a value or growth manager with a core index or benchmark, which is their proxy for the market. Nevertheless, it seems to happen more than often.

The July 12, 2010 issue of Barron's pours more water on the subject of fund classification by Morningstar. Barron's reports that, of 248 funds carrying five-star ratings as of December 1999, just four had retained that status through December of 2009, 87 could no longer be found, and the rest had all been downgraded. The point is not to chaste Morningstar as much as it is to point out that critics and watchdogs of professional money managers do not often have such a stellar (pun intended) record. In this particular case, the star ratings have no predictive ability, and it is misleading to investors that they do. Yet the SEC does not have the authority to assess this concern for investors because Morningstar does not manage money.

Now, to qualify these comments, sometimes it does happen that unscrupulous managers pick a benchmark with a design in mind of picking something easier to beat than the proper bench. We would suppose companies like Morningstar and Lipper shine the spotlight on these kinds of behaviors, because, if a stated benchmark is the Russell Midcap Value index and the fund's past returns have an $R^2$ with the EAFE index (a large-cap international index), that is 20 points higher than the Mid Cap Value index. Clearly, there is something corrupt here, and one should be on guard against what the manager says the fund is doing versus what it is actually doing with its investment process. In general, regressing returns against various benchmarks in hopes of trying to better pick the benchmark than the one given in the fund's prospectus is very much like having a hammer and needing a nail. Sometimes it really is the case that the process acting like a consultant really has only one tool and they are looking for a problem to solve with it, rather than choosing the right tool for the problem.

The regression of returns with an eye toward rightly classifying a fund's investment objectives is called a returns-based approach. An alternative methodology involves analyzing the holdings of mutual funds rather than examining the returns. If, for instance, a large (by assets under management) mutual fund owns 234 positions, all of which are found in the Russell 2000 value index, and, in addition, it states in its prospectus that the universe of buy candidates come from this index, then you can be sure its benchmark is the Russell 2000 value index and needn't run any regressions. This would be true regardless of whether its regression of returns is higher against some
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other index. A holdings-based analysis can offer a different perspective on the objectives of a fund than the returns-based analysis, and vice versa.

Now that we have identified what the market and benchmark are under the guise of CAPM, what is alpha?

THE BEGINNINGS OF THE MODERN ALPHA ERA

So what is alpha and what isn’t it? The initial definition as we know it today comes from Sharpe’s Capital Asset Pricing Model (though some attribute Jack Treynor as inventor or, at a minimum, a co-inventor). To begin, every investment carries two separate risks. One is the risk of being in the market, which Sharpe called systematic risk. This risk, later dubbed beta, cannot be diversified away. Unsystematic risk (idiosyncratic) is another kind of risk, best described as company-specific yet diversifiable. The CAPM implies that a portfolio’s expected return hinges solely on its beta, which is its relationship to the market. The CAPM describes a method for measuring the return that an investor can expect for taking a given level of risk. This was an extension of Markowitz’s thoughts in many ways, because he was Sharpe’s advisor at Rand Corporation and he had a large influence on Sharpe.

Sharpe’s CAPM uses regressed portfolio return (less risk-free return) against the market’s return (also less risk-free return) to calculate a slope and an intercept, which are called beta and alpha. Beta is the risk term that specifies how much of the market’s risk is accounted for in the portfolio’s return. Alpha, on the other hand, is the intercept, and this implies how much return the portfolio is obtaining in and above the market, separate from any other factors.

However, risk is more complicated than just beta, because risk is divided into idiosyncratic or individual company specific risk and risk due to correlations of and within companies. To understand the latter risk, consider a company that creates hardware that is used in some other company’s products, so for example consider an aircraft engine manufacturer. The correlation between an aircraft manufacturer and its suppliers is easily conceived. This can be observed by watching two companies’ stock prices through time. Because their businesses are connected through their products, if the sales of aircraft fall, so do the sales of engines. Their business prospects and earnings are correlated, and this can be observed by visually plotting their stock prices. Statisticians often call this “chi by eye.”

Correlations make risk a complicated feature, and one that people have trouble processing. So having estimates of risk and return, you can input these into a computer and find efficient portfolios. In this way, you can get more return for a given risk and less risk for a given return, and that
is beautiful efficiency à la Markowitz. Prior to Markowitz, the investment mantra was simply do not put all your eggs in one basket or put them in a basket and watch them very closely, following the Ben Graham philosophy of weighing the assets in and of the company. There was little quantification. Markowitz and Sharpe brought quantification and mathematical elegance to investing, albeit much to Graham’s chagrin.

The point of the CAPM was to compute a required rate of return of an asset given its level of risk relative to some risk-free rate. In practice, however, it has been reduced to a much simpler interpretation, even though it is wrong. The CAPM offers us an alpha and a beta, which represent the amount of return a portfolio (not an asset) offers above an index or market portfolio. That’s the alpha, while beta represents a twofold interpretation in which neither is really appropriate but it’s widely accepted to mean both whether a stock (or portfolio) is more volatile than the index (or market) and its correlation to the index (or market). Though these definitions come from portfolio managers and analysts and they are both widely accepted and used, neither one fully explains beta. Not to insult Mr. Beta, but he is nothing more than a regression coefficient. Either way, in practice, a stock with beta greater than 1 is expected to have greater volatility than its index, and if it is less than 1, it is expected to have lower volatility than its index. This is usually true but not necessarily so, as subsequent chapters will show. The alpha is what we are after, however. If one has alpha, then this implies that the portfolio-generating process, the underlying investment process, really does have an anomalous return feature associated with it, and it isn’t some risk factor masquerading as alpha.

Although alpha is usually reserved for speaking about portfolios rather than stocks, it can be used for stocks, too. How it is interpreted, however, is important for the majority of financial and institutional consultants reference it all the time, as does Morningstar, Lipper, and other fund-rating agencies. In simple terms, if a portfolio has demonstrated positive alpha, it means that, relative to some index or benchmark, the portfolio has demonstrated outperformance for the same average level of risk (given beta equal to 1) as its index. Portfolios with negative alpha underperform relative to their index or benchmark. It is a relative world here we are talking about, by which we mean performance relative to a benchmark, not cash. It is not absolute return we’re talking about, and this distinction is paramount when it comes to differentiating between long-only institutional asset management, mutual funds and hedge funds. Hedge funds live in an absolute return world, whereas long-only institutional asset management lives in a relative world.

Though academics of finance highly criticize this practitioner’s view of alpha, 95 percent of the people in the asset-management business believe
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It. And you know what? This interpretation works! For instance, suppose you have three years of monthly returns of a large-cap core (or blend) portfolio and three years of monthly returns to the S&P 500. Now, subtract the benchmark’s returns from the portfolio’s return, and graph this excess return vs. the benchmark’s return. The slope is beta and the intercept is alpha (approximately; strictly speaking, you need to subtract out the risk-free return beforehand). If the alpha is positive, you have a good portfolio that outperforms its index, and if, simultaneously, the slope (beta) is less than 1, you obtained that return for less risk than its index, too—or so it is interpreted.

IMPORTANT HISTORY OF INVESTMENT MANAGEMENT

Why is alpha so earnestly sought after in modern quantitative investment management? Alpha is the legacy of focus by most analysts and portfolio managers as ordered by chief investment officers (CIOs) because of the history of the field of investment management. In the early days, analysts performed portfolio management, and management meant reading, digesting, and regurgitating balance-sheet information. Prior to 1929, the assets of a firm were the most important consideration, and stock selection was predominately based on how good the book value was. Later, after the 1929 crash, earnings became more important, and Graham, in an article in Forbes, said value has come to be exclusively associated with earnings power, and the investor no longer was paying attention to a company’s assets, even its money in the bank. In addition, these early analysts believed (some still do today) that they were ascertaining, by their fundamental analysis, a company’s alpha simultaneously with its risk, and to a certain extent that was true. However, those early analysts never ascertained the co-varying risk this way, only the company-specific risk. This is because the typical fundamental analyst thought of individual companies as independent entities. There was a natural tendency to view investments in isolation, and not to think of the portfolio as a whole or of risks due to co-ownership of several correlated stocks.

A really cool analogy of correlation comes from watching how a flock of starlings or pigeons fly or how a large school of small fish behaves. Ever notice how the whole group of them flies in one continuous group—a portfolio of birds, weaving and diving—and, although it is clear that their flight paths are correlated, it is hard to pinpoint the leader of such a flock. You would have to be a scuba diver or watch Discovery channel to see identical behavior in a school of fish, but they also swarm and change.
directions, seemingly without any leader. Interestingly, if you get 50 people
grouped together in a parking lot and tell everybody to keep an arm’s length
away from all your neighbors and try to stay near the same three or four
people who are around you at all times, you get the same behavior as the fish
and birds. Unfortunately for people, nobody will move unless you yourself
are in the group, stand on the edge and start walking. The three to four
people around you will follow you to keep you close, and their nearest
neighbors will do the same, and then the whole group will start moving.
The crowd will demonstrate the same behavior as the flock of birds and
school of fish. In like fashion, stocks are similar. Correlation is palpable, but
it is unobserved by watching a single bird, fish, person, or stock.

Alpha considerations alone also tend to create portfolios of higher risk
and volatility, resulting in portfolios of lower information ratio (excess re-
turn over a benchmark divided by the tracking error of the portfolio, to be
defined later) and you would have no idea what the tracking error is (or an
estimate of it). In addition, the exposure of the portfolio to risk will be con-
fused with the active bet or weight of various positions in the portfolio when
thinking of alpha alone. For instance, you might have a portfolio that has
3 percent overweight relative to its benchmark in banks, say, when, in reality,
there is a 4 percent exposure to banks simply because the portfolio also owns
a couple of stocks that are highly correlated to banks that have not been
accounted for consciously. Lastly, considering the alpha alone when con-
structing a portfolio usually leads position sizes to be directly proportional
to the expected alpha or return for each stock. Thus, the highest proportion
of money will be tied up in stocks that the analyst who runs the invest-
ment process believes has the highest return potential, regardless of its risk.
This last point may result in unaccounted losses and larger-than-expected
drawdowns.

In current quantitative efforts in modeling for alpha, the goal is primarily
to define the factors that influence stocks or drive returns the most, and
construct portfolios strongly leaning on those factors. Generally, this is done
by regressing future returns against historical financial-statement data. The
type of variables chosen, however, differs depending on the investor’s time
horizon. For shorter holding period models and strategies, trading data (bid,
ask, daily volume, daily prices) may be used as the independent variables
in these regressions. For a holding period of a quarter to several years, the
independent variables are typically financial-statement data (balance-sheet,
income-statement, and cash-flow data). For even longer holding periods
of three years or more, the independent variables are macroeconomic in
nature (GDP, unemployment rates, CPI, spread between long and short
Treasury yields, yield curve slope). The reason the underlying factors change
depending upon the holding period has much to do with the correlations of
these variables with assets on these time scales. At least for the shortest and middle range holding periods, the factors are security or company specific. It is only for very long term holding periods—longer than three years—that economic variables are the stronger influencers of return, and these variables are not company specific. When investing in these time scales, thematic investing is usually the strategy employed, and it is less a quantitative practice than for the other two time horizons of investing. Players in this realm involve themselves in country-specific issues, currency plays, economic news, and a whole assembly of macro top-down perspectives. Quant’s role in this endeavor is mostly fleeting.

In the majority of quant firms that manage assets today, the typical operations and day-to-day activities of quantitative analysts and portfolio managers is testing and modifying alpha models. That said, there are umpteen possibilities for constructing alpha models, and this keeps the quantitative analyst plenty busy!

**METHODS OF ALPHA SEARCHING**

The search for alpha continues unabated since before the time of Graham. Curiously, the halls of academia have pretty well mapped out many features and subtleties of investing, certainly in the qualitative venue. Google knows where articles on alpha generation exist and with some thousands of dollars, one can shop Amazon, Borders, and Barnes & Noble and come away with hundreds of titles, subtitles, and chapters written about, discussed in depth, and opined on alpha. Many of these titles go back before Graham and Dodd’s brilliant expose on *Security Analysis* in 1934.

Over the course of time, the number and frequency of published books on investing, which, by the way, are all about alpha, has a cyclical pattern peaking at market tops. As one might expect, books about risk analysis also peak right after the market tops. So alpha and risk publications, the yin and yang of investing, run countercyclical to each other. In addition, though much has been written from the fundamental side, taking 1934 as an anchor, fundamental investing has been under the microscope for 76 years or thereabouts. On the other side of the investment curriculum lies the relatively new field of quantitative investing, in the modern sense of the word, with computers doing much of the research. With the PC revolution came the ability to search for empirical patterns of return, influenced by economic and financial-statement data (i.e., factors), much faster than the human mind can do and, in addition, often with higher credibility. A lot has been published on the empirical side in the academic literature; however,
much more work has not been published from the work of the practicing investor. What has been published is often of dubious practicality in the hands of the investment manager.

It is also the situation that the mapping of factors based on empirical observation has no standardization in which to offer overwhelmingly convincing evidence that a given factor is definitively a cause of stock return. There is no agreed upon method or statistical test that proves the validity of any empirical data set being responsible for the stock return time series. Much of this has to do with the unreasonable behavior of the stock market, and we will get into much of its nonlinear dynamic and chaotic behavior in future chapters. The stock market is not a repeatable event. Every day is an out-of-sample environment. The search for alpha will continue in quantitative terms simply because of this precarious and semi-random nature of the stock markets. In addition, the future is wide open for alpha searching in similar context for fixed income as quantitative approaches are in their infancy for these securities.

Lastly, much of the current research on alpha is beginning to offer explanations for the effect of certain factors on return. Many of these researchers, such as Jeremy C. Stein of Harvard, are attempting to offer fundamental explanations for factors that have been discovered (via the preponderance of the empirical evidence) to offer anomalous return, in the guise of the efficient market hypothesis. Still others, like Sheridan Titman from the University of Texas at Austin and Werner De Bondt of DePaul University, attempt to explain momentum strategies using behavioral finance theories.

In the simplest description of alpha, factors matter only to the extent that one can make economic sense of them. That is, you need to know that the anomalous outperformance of return from some factor is not due to Voodoo but has explanatory power related to some economically sensitive variable. Zip codes and weather forecasts should not have predictive power or consistent behavior in forecasting stock returns. For the practitioner, this is paramount for acceptance and for realization in an investment strategy. An alpha signal generated by some factor must have certain characteristics, including the following simple rules of thumb:

1. It must come from real economic variables.
2. The signal must be strong enough to overcome trading costs.
3. It must not be dominated by a single industry or security.
4. The time series of return obtained from the alpha source should offer little correlation with other sources of alpha.
5. It should not be misconstrued as a risk factor.
6. Return to this factor should have low variance.
7. The cross-sectional beta (or factor return) for the factor should also have low variance over time and maintain the same sign the majority of the time (this is coined factor stationarity).

8. The required turnover to implement the factor in a real strategy cannot be too high.

We’ll now review these alpha characteristics one at a time. The first characteristic assures that the investment process under construction is not subject to spurious correlation sources, that is, that it comes from real economic variables. This is mostly a reality check. For instance, if you form a portfolio of inverted price, you can observe some empirical evidence that there are anomalous returns. However, 1/Price cannot be a source of real economic value, hence you could not use this factor, so it’s rejected simply by this rule.

The second characteristic concerns the impact of trading costs on portfolio return. When sifting data empirically, it is often easier than you can imagine to observe some excess return with some factors. However, if the return is not sufficient to overcome trading costs, it can never be implemented. For instance, the reversal strategy (buying stocks that have gone down over the last week and selling stocks that have gone up in the last week) is arguably a nonworking strategy. There is alpha in reversal strategies, but the high-frequency trading required to implement it makes it a tenuous methodology for the average prudent investor because of the trading costs involved. In the current market, high-frequency trading firms and the proprietary trading desks of many large banks do utilize reversal strategies, but they have methods to overcome the cost of trading and, in fact, utilize sophistication in some ways so that the more they trade, the less the cost to the portfolio. This is unlike what is available to the average investor, however.

With respect to the third characteristic, generally, most quant strategies and applications of quant involve portfolio construction for the type-2 quant. In this vein, a particular factor that seems to work in only one sector or industry can, therefore, only be employed in a portfolio setting, if all the other sectors or industry also have their own model. It is uncommon to find single factors that work in only one industry and hard enough to find a single factor to work in each industry. One application of this does exist, and that is if you are building a model consisting of several factors for a given industry with the goal of building a portfolio specific to this industry. However, for the average investor, this is more risky than building a portfolio covering many sectors simply because of the lack of diversification and high cross-correlation (covariance) between the stocks in one industry. Many funds in the public domain
that have high industry concentration could benefit from industry-specific models. (If managers of any of them are reading this book, they should omit this rule.)

For the fourth characteristic, that the time series of returns from differing alpha sources should be noncorrelating, first you should know that you derive a time series of returns from every alpha source. Because ultimately you will be building a model from several factors, you would like the return time series from each factor to be as independent from one another as possible. Just as diversification of stocks offers lower risk in the portfolio, choosing stocks from differing alpha sources also diversifies risks and, in fact, the two diversification methods are related. Though complete disconnect is impossible using economic or financial-statement variables to model security returns, it is wise to choose one’s variables from diverse categories like valuation, profitability, cash flow, momentum, fundamentals, growth, and capital allocation. Though the alpha searching process usually examines several factors from each of these groups, typically factors within a group have more correlation than factors across groups. Graham knew this and it is the reason he considered independent financial-statement data for his investment methodology. Thus, choosing only valuation factors, say B/P, E/P, cash-flow/P, and S/P for your investment process is inherently risky because the final portfolio would mainly be constructed from a single alpha source, since these factors are typically highly correlated. This does not mean there will not be a period of time when you would have great gain. From March of 2009 to the end of the year, stocks bought simply by selection of low valuation alone would have outsized returns, but in 2008, your portfolio would have been destroyed by pure valuation alone.

With regard to the fifth characteristic, there are risk factors and there are alpha factors. It is safe to say that if a factor is not a risk factor, and it explains the return or the variance of return to some extent, it must be an alpha factor. A way to tell is if, in a regression equation with other factors known to be risk factors (like market returns [CAPM] or large-minus-small size from Fama-French equation), there is found a zero alpha, even though the factor increases the $R^2$ of the regression, then it’s probably a risk factor. This would mean though it’s helpful in explaining returns, it doesn’t offer outperformance.

In other words, if the presence of the factor in the regression simultaneously raises the $R^2$ while decreasing the intercept coefficient, it is a risk factor rather than an alpha factor. A great example is a 12-month past-earnings growth. Though returns are colinear with this earnings growth, they are poor predictors of future returns. This is because many investors will have bid up the pricing of stocks that have shown historically good earnings growth concurrently with earnings announcements. However, 12-month past-earnings
growth fails miserably at being a forecaster of future return. We will see that Graham liked to see earnings growth, but he examined it over years, not over simple 12-month measures. In this case, 12-month past-earnings growth is probably a risk factor because it regresses well with future return statistically, but offers little in the way of alpha. Generally any alpha factor that has been working for a long period of time becomes discovered by the market and ultimately arbitraged away and reduced in status to being a risk factor.

The next characteristic of alpha sources involves the volatility of the factor’s return time series. The variance of these return time series should be low. It is not helpful if the factor’s return time series is wildly oscillating over time. If so, it is difficult to harness the alpha in a portfolio. Unstable regression coefficients or, in simpler terms, unstable relationships of the factor with return usually follow this scenario. In other words, the factor’s correlation with future return is nonstationary and it would be difficult to count on it consistently in an investment process simply because it would not be persistent.

We now have to spend a bit of time discussing beta. In a typical factor search for alpha, you regress a list of stocks’ return against factors one date at a time or in a panel regression. In this way, the method obtains a beta for each and every time period, for each and every factor. So if there are 60 one-month periods, you obtain 60 betas for each factor in a time series. A requirement for usefulness is that the beta does not move around. So, if at the first time period the beta is 0.34, over the 60 months of calculation, beta cannot move from 0.34 to −.46 to 0.75 and finally settle at 0.22 and suggest usefulness. That would be unacceptable for a risk model and certainly for an alpha model, too. Hence, the variance of the time series of the beta cannot be too large. You should aim for small beta variance. Ultimately, these beta variances are chosen to build up a covariance matrix in risk forecasting; also, so you do not want them too large because one doesn’t want a highly volatile portfolio. In addition, there is a relationship between stock volatility and beta volatility; the Stochastic Portfolio Theory (SPT) discussed in Chapter 9 explains how volatility takes away from long-term return. Generally, you want to own stocks of low volatility, unless you have very sophisticated optimization methods you can run under Stochastic Portfolio Theory, which is outside the scope of this book.

Lastly, the whole objective here is to build portfolios. Graham liked three-year holding periods generally or 50 percent returns, whichever came first. For the strategies Graham employed, purchasing low-valued stocks that are mispriced is the favorite of his process; however, you cannot know how long it will take the market to realize the mispricing. Hence, the typical stock has an unknown holding period, though it is usually fairly long by today’s
standards. In general, Graham’s method has low portfolio turnover, as do most value investors’ strategies. In addition, increasing turnover comes with increasing trading costs. Thus a factor that has a short-lived alpha—such as one that offers higher one-month returns relative to a benchmark that decays rapidly so that each month one must rebalance the portfolio at a high rate to sustain the investment advantage—is undesirable. In fact, for most institutional investors, wealth managers, and the typical Fidelity, Schwab, ETrade, or Ameritrade investor (not day traders), the trading costs of a high-turnover strategy cannot be overcome by the usual alpha obtained from financial-statement factors or pricing functions (i.e., price momentum). This, of course, does not include high-frequency trading methodologies, but their technology is very sophisticated and not for the average investor.

The next chapter introduces risk to the reader and covers it quite extensively. Risk modeling and alpha modeling are similar, but in alpha modeling one is not as concerned about the covariance structure as much as one is concerned about stable alpha. This will become clearer as we move forward to dissect risk.