

Introduction

- This book covers the general topic of expected returns on investments. The traditional paradigm among institutional investors focuses too much on historical performance and too narrowly on asset class allocation. This book argues that investment decision making should be broadened beyond the asset class perspective and a wider set of inputs should be used for assessing expected returns.
- The book considers in detail a wide range of return sources: major asset classes (stocks, bonds, and alternative investments) and strategy styles (value, carry, momentum, and so forth) as well as risk factors (such as growth, inflation, and liquidity).
- The main inputs—beyond discretionary views—for investors to judge expected returns are (1) historical performance, (2) theories, and (3) forward-looking indicators. A better understanding of these inputs and a better balance among them is needed.
- Well-known evidence of historical asset returns include the significant long-run outperformance of stocks over bonds (less so in the 19th and 21st century than in the 20th century) as well as more moderate rewards for bearing interest rate risk and credit risk.
- Less familiar historical findings include the pervasive success of value, carry, and momentum strategy styles in several markets as well as the tenuous relation between volatility and average returns. This book highlights the low long-run returns of the most volatile assets within each asset class, a finding that may reflect risk-seeking (“lottery-playing”) behavior by investors, or that may be explained by leverage constraints.
- Finance theories have changed dramatically over the past 30 years, away from the restrictive theories of the single-factor CAPM, efficient markets, and constant expected returns. Current academic views are more diverse, less tidy, and more realistic. Expected returns are now commonly seen as driven by multiple factors. Some determinants are rational (risk and liquidity premia), others irrational (psychological biases such as extrapolation and overconfidence). Expected returns on all factors may vary over time.
- A central insight from academic finance theories is that required asset returns have little to do with an asset’s standalone volatility and more to do with *when* losses can be expected to occur. Investors should require high-risk premia for assets that fare poorly in bad times, whereas safe haven assets (that fare well in bad times and less well in good times) can justify low or even negative risk premia. Strategies that resemble selling financial catastrophe insurance—steady small gains punctuated by infrequent but large losses—warrant especially

high risk premia because their losses are so highly concentrated in the worst times.

- Forward-looking indicators such as valuation ratios have a better track record in forecasting future asset class returns than rearview mirror measures. The practice of using historical average returns as best estimates of future returns is dangerous when expected returns vary over time. Recall stock markets in 1999–2000.
- Long-run expected returns for any investment tend to be especially high following adverse events. For example, equity markets tend to have predictably higher returns after recessions, and nominal bonds after high inflations.
- Investors can try to boost expected returns by taking risks that produce attractive rewards for all market participants (beta risks) and/or by skillful active management (alpha) which may involve exploiting regularities and market inefficiencies. This book offers a comprehensive guide for smart harvesting of beta risk premia, covering both long-run exposures to traditional and alternative betas as well as tactical beta timing. However, I concede from the outset that the magic of view-based alpha generation cannot be conveyed in a book.
- Two visual aids—an elephant and a cube—help the reader keep “the big picture” in mind through the book.
- Although I present large amounts of empirical evidence about historical returns and forward-looking indicators, as well as numerous theories in an attempt to make sense of the data, I believe it is important to stress humility. Hindsight bias makes us forget how difficult forecasting is, especially in highly competitive financial markets. Expected returns are unobservable and our understanding of them is limited. Even the best ‘experts’ forecasts are noisy estimates of prospective returns.

*It was six men of Hindostan,
To learning much inclined,
Who went to see the elephant
(Though all of them were blind);
That each by observation
Might satisfy his mind.*

—J.G. Saxe (*to be continued*)

The traumatic housing and credit crisis that began in 2007 challenged many beliefs about investing and financial markets. The aftershocks of the crisis are still felt in many markets and economies (not least in public finances), but it is no longer necessary or advisable to view the future solely through the prism of this crisis. Instead, this book surveys the landscape of expected returns and long-term investment prospects based on lessons learned over decades.

The traditional paradigm of institutional investing focuses on relatively static asset class allocations that are largely determined by historical performance. We must go back to basics and broaden the traditional paradigm in two ways. The inputs used for assessing expected returns should be better balanced and the idea of what constitutes investments should be challenged beyond the asset class perspective.

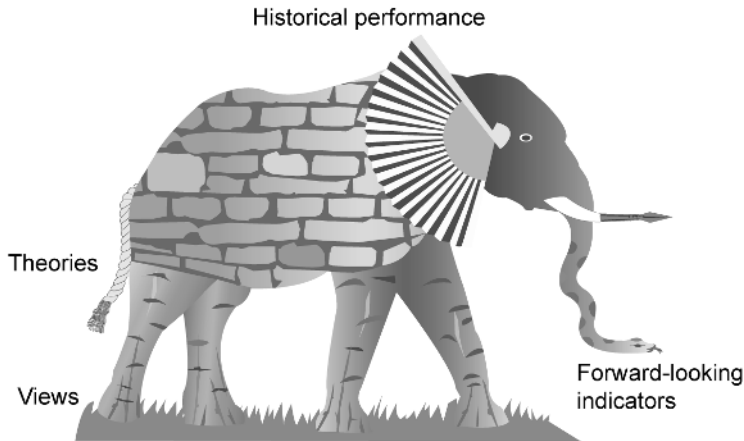


Figure 1.1. The elephant: Shining light on expected returns from different directions.

The foremost need for multi-dimensional thinking is on inputs. When investors make judgments about the expected returns of various investments, they should guard against being blinded by past performance and must ensure that they take all or most of the following considerations into account:

- historical average returns;
- financial and behavioral theories;
- forward-looking market indicators such as bond yields; and
- discretionary views.

Figure 1.1 recalls the parable about several blind men and an elephant, as told by the American poet John Godfrey Saxe (1816–1887), each man describing one part of the elephant from his narrow vantage point. One man is feeling the leg and calling it a tree, another touching the ear and naming it a fan, a third mistaking the tail for a rope, and so on. Each man misses the big picture—and so will investors who study expected returns from a single vantage point.

*The first approached the elephant,
And happening to fall
Against his broad and sturdy side,
At once began to bawl,
“Bless me, it seems the elephant
Is very like a wall.”*

So the challenge is to refine the art of investment decision making in a way that exploits all our knowledge about historical experience, theories, and current market conditions, without being overly dependent on any one of these. This book will summarize the state of knowledge on all these aspects, but it focuses on the first three inputs since these are systematic. I have less to say about discretionary views since these are inherently investor specific. However, the approaches described in this book will help readers form such views. Stated differently, investing involves both art and science; a solid background in the science can improve the artist.

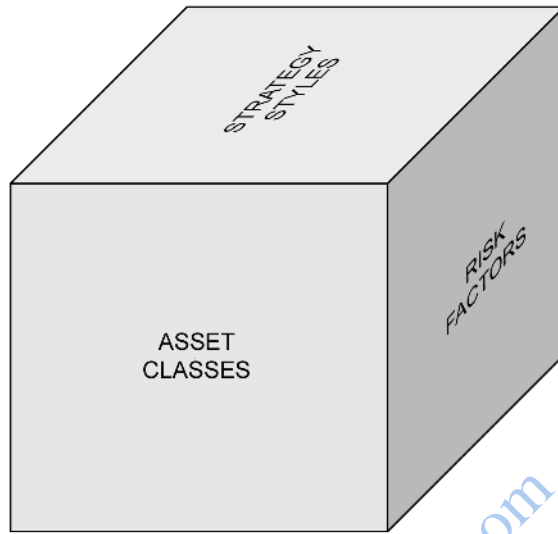


Figure 1.2. The cube: Three perspectives on investments and their expected returns.

Before turning to these inputs, I address the reasonable question “Expected returns on what?” The traditional paradigm has been to break the complex world of investments into simplified groupings called asset classes. Analyzing, and allocating to, asset classes has been the dominant approach but I argue that studying investments from perspectives other than asset classes can enhance our understanding of return sources and our ability to diversify effectively. This book will add to the asset class perspective the complementary viewpoints of *strategy styles* and *risk factors*, as in the three-dimensional “cube” in Figure 1.2:

- Starting with the asset class perspective, I will cover all traditional asset classes (equities, government bonds, credits) plus many alternative ones (including real estate, commodities, hedge funds, and private equity). I focus on long-run returns but also review tactical market-timing approaches. A broader mindset naturally leads to questioning the traditional 60/40 portfolio which relies excessively on one source of excess returns (the equity premium) and which therefore has highly concentrated risk (more than 90% of portfolio volatility is due to equities).
- The strategy style perspective is especially important for understanding the profit potential of popular active-trading approaches. Value, carry, momentum, and volatility styles have outperformed buy-and-hold investments in many asset classes. Styles can also offer better diversification opportunities than asset classes.
- Sophisticated investors are increasingly trying to look beyond asset classes and strategies in order to identify the underlying factors driving their portfolio returns. A factor-based approach is also useful for thinking about the primary function of each asset class in a portfolio (stocks for harvesting growth-related premia, certain alternatives for illiquidity premia, Treasuries for deflation hedging, and so on) as well as for diversifying across economic scenarios. Among underlying risk factors, I opt to focus on growth, inflation, illiquidity, and tail risks (volatility, correlation, return asymmetries).

*The second, feeling of his tusk,
Cried, "Ho! What have we here
So very round and smooth and sharp?
To me, 'tis mighty clear
This wonder of an elephant
Is very like a spear."*

How can investors deal with the complexity of multiple inputs and perspectives, let alone with the even more bewildering assortment of novel investment products on offer? This book provides a map to investors, giving a bird's eye view over a rugged terrain and occasionally zooming in to interesting locations (12 case studies), not unlike Google Earth™. I hope my two visual aids—the elephant and the cube—will help readers keep the forest in sight among the many trees along the way.

Next, Sections 1.1–1.4 give an overview on the four perspectives on “feeling the elephant” (i.e., on considerations for judging expected returns). These themes will be expanded on through the book.

1.1 HISTORICAL PERFORMANCE

Historical average returns are a common starting point for judging expected returns. The idea is that if expected returns are constant over time, long-run average realized return is a good estimate of expected future return. Unexpected news dominates returns in the short run but the effects of such news tend to cancel out in the long run.

Why should you think twice before using historical returns as forecasts of future returns?

- Any sample period may be biased—in the sense of not being representative of market expectations—so that unexpected returns do not neatly cancel out, especially if the sample starts or ends at times of exceptionally high or low market valuations. Wind-fall capital gains during a benign sample can boost average returns meaningfully even over multiple decades. Bond indices are a prime example, given the downtrend in bond yields since the 1970s and 1980s when a number of the widely used bond index histories start.
- In principle, longer historical windows reduce sample specificity and enable more accurate estimates of average returns. However, distant historical data may be irrelevant due to structural changes, apart from lower data quality. Would we really want to include data from the 1600s even if good-quality returns were available to us?
- Expected returns may vary over time in a cyclical fashion, which makes extrapolation of multi-year performance particularly dangerous. Periods of high realized returns and rising asset valuations—think stock markets in the 1990s—are often associated with falling forward-looking returns.
- For specific funds and strategies, the historical performance data that investors get to see are often upward biased. This bias is due to the voluntary nature of performance reporting and survivorship bias (so that poor performers are left out of databases or are not marketed by the fund manager). A similar caveat applies to simulated “paper” portfolios because backtests may be overfitted and trading costs ignored or understated.

These concerns notwithstanding, this book presents extensive evidence of long-run realized returns, when possible covering 50-to-100-year histories. Several main findings are familiar to most readers:

- Stock markets have outperformed fixed income markets during the past century in all countries studied. The compound average real return for global equities between 1900 and 2009 is 5.4%, which is 3.7% (4.4%) higher than that of long-term government bonds (short-dated Treasury bills). Stocks' outperformance over bonds is 0.5% to 0.8% higher for the U.S. than globally and was even more pronounced before the negative returns in 2000s. The experience of the current investor generation has buried the myth that stocks always beat bonds over 20-year or 30-year horizons. (This myth was never true. Many exceptions to it occurred outside the U.S. in the 20th century and inside the U.S. during the 19th century.)
- Among fixed income markets, long-term bonds have outperformed short-dated bonds by 0.5% to 1% and credit-risky corporate bonds have outperformed comparable government bonds by 0.3% to 1% (low end for investment-grade bonds, high end for high-yield bonds). More surprisingly, the reward for bearing interest rate risk or credit risk is most consistent at short maturities. At the back end of the yield curve and at the low end of the credit spectrum there has been scant long-run benefit for additional risk taking.
- Illiquid assets have tended to offer moderately higher long-run returns than their liquid peers. Part of corporate bonds' excess returns over Treasuries reflects the liquidity disadvantage of corporates, and the same appears true for small-cap stocks over large-cap stocks. Evidence across asset classes is more ambiguous because various reporting biases may overstate published private equity and hedge fund returns. Moreover, average return differences can reflect premia for various risks and not just for illiquidity; disentangling the determinants is quite hard.

Other findings are less widely known:

- Certain active strategy styles have proved profitable in several asset classes, adding several percentage points to annual average returns. The most prominent styles are value (overweighting assets that appear cheap based on some valuation metrics, while underweighting richly valued peers), carry (overweighting high-yielding assets while underweighting low-yielding assets), and momentum (overweighting assets that have outperformed over multiple months while underweighting recent laggards). The rewards from simulated active strategies are often overstated due to overfitting or selection biases. Yet the value, carry, and momentum profits have been so prevalent that there is little doubt that these opportunities really existed in the past. The pertinent question is whether these strategies will remain profitable now that they are so well known. If their profits represent (at least in part) risk premia rather than market inefficiencies, it is less likely that future excess returns will be fully competed away.
 - A flipside of the value effect is that “growth assets”—stocks of firms or countries with high past and expected growth rates—often deliver poor long-run returns that can be traced back to their high valuation ratios. One behavioral explanation is that investors over-extrapolate past growth rates and thus overpay for growth assets. No investment is attractive at any price, however fast growing it has been.

- Yield seeking has been profitable in many contexts but more so in cross-country trades than in within-country trades. The worst results are for complex carry products that may contain hidden costs and risks.
- Chasing returns sounds very naive but favoring past winners has not been a bad strategy historically—as long as history lengths to measure past returns are judiciously selected. Details differ across asset classes but most investments exhibit momentum (continuation) tendency over multi-month horizons and a mild reversal tendency over multi-year horizons.
- The empirical relation between volatility and expected returns is tenuous. Volatility and long-term average returns are positively related across asset classes. Moreover, a strategy of writing equity index options earns positive long-run returns, a justifiable reward given the inherent riskiness of effectively selling financial catastrophe insurance. However, the most volatile assets *within* each asset class—high-volatility stocks, 30-year Treasuries, and CCC-rated corporates—tend to offer low long-run returns and even worse risk-adjusted returns. This surprising pattern may reflect investors' lottery-seeking bias (overpaying for the hope of jackpot returns) as well as leverage constraints (overpaying for inherently volatile assets that give high bang for the buck for naive return seekers). Avoiding the inherently volatile rockets of each market (lottery tickets) and leveraging up inherently stable assets have boosted returns in the past, even before the leverage restrictions were tightened in the aftermath of the 2008 crisis.

1.2 FINANCIAL AND BEHAVIORAL THEORIES: A BRIEF HISTORY OF IDEAS

*The thirú approached the animal
And happening to take
The squirming trunk within his hands
Then boldly up and spake:
“I see,” quoth he, “the elephant
Is very like a snake.”*

Finance is a field in which academics and investment practitioners have had a huge influence on each other, as highlighted in Peter Bernstein's books *Capital Ideas* and its sequel *Capital Ideas Evolving*. The theory of finance evolved dramatically during the last half-century, contemporaneously with the period during which investing grew into a big professional business. Until the 1950s finance theory hardly existed: the focus was on predicting cash flows, not on risk or required returns. Then, three decades of pioneering research brought about an academic consensus view that relatively simple theories employing highly restrictive assumptions—the single-factor CAPM, the efficient market hypothesis, constant risk premia—could explain asset prices and expected returns:

- A starting point in finance is that investors set prices so that an asset's cost equals its expected benefits. Aggregating across investors, each asset's market price equals the expected sum of its future cash flows discounted to the present value (i.e., expected cash flows are divided by $1 + \text{Discount rate}$).

- Asset-pricing theory focuses on the determinants of discount rates or required returns. In market equilibrium, an asset's expected return equals the required return that rational investors together demand. Risk-averse investors do not use the riskless rate for discounting, unless the cash flow being discounted is itself riskless; the discount rate also reflects the required compensation for the riskiness of an asset's expected future cash flows. This compensation in turn reflects both the amount of risk and the intensity of investor aversion toward risk.
- According to the Capital Asset Pricing Model (CAPM), an asset's amount of risk is fully captured by its (equity) market beta, while general investor risk aversion determines the size of the market risk premium. Each asset's expected return in excess of a common riskless rate equals the product of the asset's beta (sensitivity to market movements) and the common market risk premium. The difference in expected returns across assets reflects only differences in the betas of the assets. Investors can boost long-run returns by bearing more beta risk: by holding higher beta stocks and by shifting allocations from fixed income (with beta near zero) to equities (with beta near one).
- Given the assumption of constant expected returns, the long-run average of realized returns is a good estimate of expected return, even if realized and expected returns can differ sharply over any short time window. Attempts to time the market were deemed a particularly wasteful form of active trading because moving from equities to cash implies forfeiting the large and presumably constant equity premium.

Such restrictive theories did not prove sufficient to explain real market behavior. As new evidence accumulated, both academic and investor opinions evolved:

- In recent decades, high-beta stocks and high-volatility stocks gave no return advantage, perhaps the reverse. Value and momentum tilts were more consistent return enhancers among equities, while related carry and trend strategies fared well in other asset markets.
- The realized premium of equities over bonds turned out to be slim compared with earlier histories, and views on the future equity premium were trimmed down.
- Several very large boom–bust cycles made the idea of constant risk premia less credible and that of market timing more acceptable.
- After the cult of equity busted around the year 2000, alternative assets, carry trades, and harvesting illiquidity premia became the preferred ways to boost returns. All these approaches resulted in dramatic losses in 2008.
- Just when investors learned to value conservatism, junk bonds and speculative stocks rallied by at least 100% in the year ensuing the crash bottom in March 2009.

So where are we now? Current academic views are more diverse, less tidy, and more realistic than they used to be. Between 1980 and 2010, empirical and theoretical work added flesh to the core models by incorporating multiple risk factors, time-varying expected returns, liquidity effects and other market frictions, as well as investor irrationality. The field is increasingly seeking help from outside finance, economics, and statistics by turning to psychology, biology, physics, and even philosophy.

Greater realism is welcome but is no panacea. Theories can only enhance our understanding if they simplify the messy real world. In that spirit, I highlight some core ideas that apply to all investments.

Complex reality with multiple return drivers, both rational and irrational

If investors want to earn expected returns higher than the riskless rate, the most reliable way is to bear risks that markets reward with a premium. A less reliable way is to pursue active management, in which successful investors (skillful or lucky) reap gains at the expense of their less successful peers.

The simple story of a single risk factor, constant expected returns, and fully rational investors is outdated. Even in a more complex world with several drivers of required returns, equity market beta—or more generally sensitivity to economic growth—remains the most important risk source. Beyond equity market beta, exposures to inflation, illiquidity, and tail risks (such as volatility) influence many assets and are rewarded.

The interrelations between factors matter. Portfolio diversification is more effective with independent or, even better, with negatively correlated return sources. However, many return sources tend to be positively correlated—and especially so during a systemic crisis such as that of 2008. I will present return analysis separately for numerous factors or return sources but I already note that these can overlap with each other or be empirically correlated (I show some evidence at the beginning of Chapter 16).

The rewards may have rational or irrational origins. Numerous behavioral stories explain the high returns of certain asset types or trading strategies as being due to mispricing rather than fair compensation for risk. I present many examples of irrationality, emphasizing investors' extrapolation as well as over- and underreaction tendencies as drivers behind the long-run outperformance of value and momentum strategies.

Expected return differentials across assets depend less on volatility . . .

Many investors view the risk–reward tradeoff as being determined through an asset's standalone risk. *Stocks are more volatile than bonds and thus deserve higher long-run returns. Likewise, long bonds are more volatile than short bonds and thus deserve higher long-run returns.* This idea points in the right direction—that risk influences expected returns—but misses the fact that *all volatility is not equal*.

Each asset reflects a bundle of underlying risk factors and some idiosyncratic risk. Diversifiable (idiosyncratic) risks should not earn any reward; only systematic risks (those that cannot be eliminated through diversification) can be expected to be rewarded with a premium. The reward for volatility can differ depending on which of several systematic factors is the source of the volatility. Overall, the theoretical relation between volatility and expected return is quite ambiguous (and, as already noted, the empirical relation is tenuous).

. . . and more on the typical timing of losses

Although there are a number of different risk factors, one key rational theme explains what drives financial risk premia. *Assets or factors that perform poorly in "bad times"—think of recessions and financial crises—warrant high required returns.* Conversely, safe haven assets (such as long-term government bonds, at least since the late 1990s) that smooth portfolio returns in bad times deserve a low risk premium. This central insight in modern academic finance about asset risk premia implies that certain assets and/or

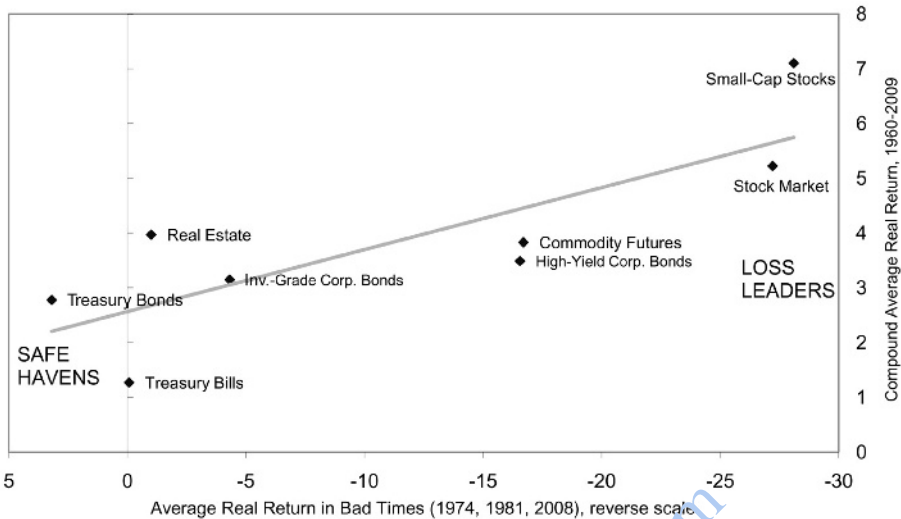


Figure 1.3. Asset class performance in the long run vs. in bad times.

Sources: Bloomberg, Ken French's website, Citigroup, Barclays Capital, S&P GSCI, MIT-CRE.

strategies deserve high long-term returns (and offer especially juicy returns in good times) *exactly because* they tend to give a terrible performance just when it hurts investors most. Many practitioners and policymakers had to wait until 2008 to learn this lesson, the hard way.

For illustration, Figure 1.3 scatterplots 50-year average real returns of various U.S. asset classes on a simple proxy of “bad times performance”—average losses in arguably the three worst years (1974, 1981, 2008) for financial markets and the global economy during this half-century. The empirical relation is hardly linear but the assets with the best long-run performance—small-cap stocks—also gave the worst losses in bad times. At the other end, Treasury bills and bonds with low long-run returns were the best safe haven assets in bad times (more so in deflationary 2008 than in inflationary years).

Traditional equity and bond investments have well-understood risks and premia, but the same cannot be said for investments with asymmetric risk profiles (“picking up pennies in front of a steamroller”). Investors should be especially wary of strategies that amount to selling tail insurance or “lottery tickets” that pay off in bad times—writing options on equity indices, carry trading, and harvesting illiquidity premia. These strategies *combine* the dangers of (i) asymmetric returns and (ii) the coincidence of large losses with bad times. The long-run returns of such strategies are justifiably high, but these returns are concentrated in good times and tend to persist only until a bad event materializes. I do not have 50-year histories for such strategies but I will document below strong long-run returns for selling volatility, seeking carry, and harvesting illiquidity premia—as well as dramatic losses for each in 2008. In contrast, trend-following strategies have a surprisingly consistent record as safe havens during bad times.

Investors should not be misled by the apparently attractive reward–risk ratios of illiquid assets. These assets warrant an extra premium because of their illiquidity and poor performance in liquidity droughts, while infrequent price moves artificially understate their measured riskiness. Illiquid assets naturally suit long-horizon investors with

limited liquidity needs, but even such investors should not assume that illiquidity is always amply rewarded.

Expected rewards on all return sources can vary over time

It may now seem quaint to talk about constant expected returns but for long this was one of the classic assumptions in finance. While many practitioners questioned this assumption, market timing was generally avoided. The reasons were manifold: timing was not easy (being right too early often equals being wrong, with substantial career risk); the directional bet is highly concentrated (unlike security selection that at least benefits from diversified exposures); and cash holdings miss out the equity premium (which was seen to be especially high before the 2000s' experience).

The boom–bust cycles of the past decade shifted the consensus to embrace the idea that expected returns vary over time. Market timing no longer had such a bad name. Investors began to pay attention to forward-looking valuation ratios.

1.3 FORWARD-LOOKING INDICATORS

*The fourth stretched out his eager hand
And felt about the knee,
“What most this mighty beast is like
Is mighty plain,” quoth he;
“’Tis clear enough the elephant
Is very like a tree.”*

Forward-looking indicators such as earnings yields and bond yields are often better than historical average returns at forecasting long-term returns. Time-varying expected returns can make historical average returns very misleading as forecasts of future returns. For example, because stock prices were unusually high, the prospective returns on equities were especially low in 2000 after nearly two decades of outstanding realized returns. Conversely, the halving of global equity values between October 2007 and October 2008 surely did not hurt the prospects for subsequent long-term equity returns.

Empirical evidence suggests that near-term returns of risky assets are relatively high around business cycle troughs and relatively low around business cycle peaks. The two main explanations for the apparent countercyclic pattern in *ex ante* returns are (1) rationally *time-varying risk premia* and (2) irrational *market mispricing*. Time-varying risk premia may reflect variation in the amount of risk and/or market risk aversion. One compelling rational reason for boom–bust cycles is that risk aversion is wealth dependent and thus amplifies the gyrations in stock market valuations over time. Many people are more risk averse during recessions, which can create a feedback loop that pushes asset prices lower. (A similar feedback loop pushes already high prices higher, causing bubbles.) An alternative interpretation suggests that irrational fear or gloomy cash flow forecasts cause low market valuations during recessions. Market data cannot distinguish between rational and irrational stories, and both may have contributed to the observed return predictability.

It is not just the equity premium that varies predictably over time—most premia do. Such time variation is most obvious in the fluctuations of credit spreads, but I will review

many other examples. The inflation risk premium in nominal bonds was clearly higher in the 1980s than in the 2000s, while the illiquidity premium in many assets shifted from negligible in 2006–2007 to record high levels in 2008–2009. When salient adverse events for any risk factor materialize, the *ex ante* premium tends to widen and then only gradually decay from elevated levels, with the pace of the decay perhaps related to lingering investor memories.

Endogenous sources of return and risk—sources arising *from within* the marketplace—are a recent topic of interest and may affect any investment. The persistent success of any asset class or trading strategy leads to a “virtuous” cycle of growing popularity and further success, resulting in eventual overcrowding and subsequent disappointments. The more persistent the success and the more asymmetric the payoff, the more likely that this virtuous cycle turns vicious, ending with a rush to exit by return-chasers and leveraged traders. Sharp liquidations tend to occur amidst tightening financial conditions, and these in turn reinforce price and liquidity declines. These forces contribute to the short-term momentum and long-term reversal patterns observed for many investments.

Let us not move from the extreme of no market timing to the other extreme of thinking it is easy. It is only easy with hindsight. The market’s required returns and cash flow expectations are not directly observable. We only estimate them with the help of simple valuation ratios, or more complex theoretical models and statistical analyses, or survey data [1].

All forward-looking indicators have their shortcomings and must be used with care. A few illustrations:

- Many stock-market-timers use the dividend discount model to assess prospective equity returns. Even when two investors agree that long-term market returns reflect the sum of starting yield and growth prospect, their estimates can diverge widely. One debate is whether to use dividend yields or broader payout yields that include stock buybacks and issuance. The disagreement on growth prospects is even worse. Anyone using analysts’ earnings growth forecasts inherits the extreme optimism typical of analysts who often predict double-digit real growth over long horizons. Historical experience has been much more modest. Many investors can hardly believe that long-run real growth rates for earnings per share and dividends per share are between 0% and 2%, clearly lagging the trend growth rate for real GDP.
- Yield curve steepness is often used as a proxy for the reward for bearing interest rate risk. How on earth could the yield curve be inverted in the early 1980s when inflation was at a record high? To resolve the puzzle, recall that the yield curve reflects both risk premia and the market’s rate expectations. When short-term rates are exceptionally high (1981) or low (2010), many investors expect mean reversion to more normal rate levels. This effect makes the curve exceptionally flat (1981) or steep (2010) when short rates are extreme and thereby contaminate the curve’s information about the prevailing bond risk premium. Survey-based bond risk premia have given a better picture of the market’s required reward for interest rate risk than has curve steepness; survey-based premia have trended up and down together with the inflation level.
- The credit spread of investment-grade corporates over Treasuries has averaged over 100 basis points in recent decades. Yet, index investors in corporate credits earned only about a quarter of this spread as realized excess return. Where did the rest of the

yield advantage disappear? It turns out that the obvious culprit, default losses, made only a small dent on returns. The worst leakage was due to index investors' tendency to sell assets that leave the index and that tend to subsequently perform well, such as the BB-rated "fallen angels".

1.4 VIEW-BASED EXPECTED RETURNS

*He fifth who chanced to touch the ear
Said, "Even the blindest man
Can tell what this resembles most;
Deny the fact who can,
This marvel of an elephant
Is very like a fan."*

This book focuses on systematic sources of expected returns—reaping rewards for bearing risks that the market dislikes or exploiting common errors in investor judgments. Thus, it has little to say on view-based expected returns that are discretionary and inherently investor specific. Views on secular changes are especially important because such changes can trip contrarian investors. Even forward-looking value indicators are anchored to history; shifting anchors can thus cause persistent investment mistakes.

Many books try to understand the sources behind the value-added of superstar active managers. Unfortunately the skills of truly superior investors are hardly replicable. In the less rarefied world of ordinary active managers, nearly every view-taking investor subjectively expects the trade to be profitable. Yet we know that in the aggregate, active trading profits must amount to zero—and this is before subtracting costs and fees. Some investors are consistently successful, most are not. Realized value-added is easier to measure than prospective value-added.

If this book can help discretionary view taking only indirectly (by educating readers), can it perhaps help more in identifying superior investor subsets, investment approaches, or individual managers? To a limited degree, yes. I will quantify the past performance of some active investor categories and some systematic strategies but I stress the dangers in simply extrapolating past returns. Among investor subsets, the long-run performance of individual investor activity appears worst. Mutual fund managers as a group cannot cover their fees and the majority tend to lag passive indices. Hedge fund managers have a reasonably attractive track record *even collectively* but critics argue that returns may be overstated and reflect poorly understood risks. When it comes to individual managers, superior investors surely exist but identifying them in advance is a challenge. Performance persistence is limited, albeit stronger among alternative managers. Evidence on the impact of fund age and size on performance is mixed but more distinctive managers with relatively large active risks appear to outperform the index-hugging types [2].

Is this book relevant for designing long-term investment benchmarks or for active managers trying to beat them? Both. In a typical investment process, benchmark asset class allocations and portfolios are designed to reflect the investor's strategic (long-term) goals and constraints. The benchmark gives the *ex ante* "viewless" portfolio, or the natural place to stay, for investors who do not have tactical (short-term) views or who do not believe they can add value through active management. For active investors who

try to outperform the benchmark, benchmark portfolio return is a neutral yardstick for *ex post* performance evaluation. This book's material is naturally relevant for making strategic decisions that could be coded in a benchmark but it also discusses tactical "beta-timing" tools. There are plenty of gray areas and fuzzy boundaries (see Section 11.4) [3].

1.5 GENERAL COMMENTS ABOUT THE BOOK

I have been a student of expected asset returns for over 20 years while wearing many different hats—in the buy-side and in the sell-side, in research and in trading. I have also advised institutional investors on their long-term investment strategies, and it is mainly this last experience that has inspired this book.

I aim to be broad and comprehensive, going well beyond equities which are the focus of most books:

- The book reviews a lot of historical evidence. Despite the book's empirical bent, it also provides a theoretical and practitioner perspective for interpreting and using the data. As usual, U.S. capital markets have the most comprehensive and often longest return histories, but I also present evidence from non-U.S. markets.
- The book focuses on *long-term* expected returns, although it also discusses tactical return forecasting of major asset classes and many active trading styles. Many books exist on short-term trading, portfolio construction, and risk management, but few on long-term expected returns. The most comparable existing works are *Triumph of the Optimists* by Dimson–Marsh–Staunton (2002) (DMS) and "Stocks, bonds, bills and inflation" by Ibbotson–Sinquefeld (1976), as updated by Ibbotson Associates and Morningstar (2008) [4].
- Unlike many recent books, this one avoids a focus on the recent crisis—even though the crisis will undoubtedly cast a long shadow over markets. I hope that this book can be relevant for investors for years to come.

Given the diverse perspectives taken and asset classes covered, this book does not have just one key theme. Rather, it is a mosaic, reflecting the complexity of the real world. I will briefly discuss many theories and stories that together portray the ways that expected returns are determined, but I cannot give one coherent story. I am open-minded regarding the roles of rational and irrational influences on expected returns; indeed, both surely matter. Among the many theories and stories available, I emphasize the ones I find the most relevant, but my broader goal is to provide enough material and references to help a thoughtful reader make his or her own judgments [5].

*The sixth no sooner had begun
About the beast to grope
Then, seizing on the swinging tail
That fell within his scope,
"I see," cried he, "the elephant
Is very like a rope."*

Health warning: We should humbly recognize the limits of our understanding. Realized returns are dominated by randomness, structural uncertainty, and rare events. Expected returns are unobservable, at best estimated with noise. We should resist hindsight biases wired in us—the outcomes that materialized seem more inevitable or predictable than they truly were [6]. It is worth recalling that experts can only explain a fraction of realized return variation afterwards, and this is an inherently easier task than predicting. Any observed return predictability is mild, possibly spurious, and rarely robust. Therefore I stress humility in interpreting empirical results and even more in making predictions and in trading based on them.

My hope is that this book improves the reader's understanding of expected returns while not adding to overconfidence. With better understanding comes a healthy respect for investment risks. I do not denounce risk taking, since it *is* the main way to enhance long-run returns, but investors should choose carefully *which* risks to take and how much of each, accepting them mainly *when* they are well rewarded.

I review key investment takeaways in Chapters 28 and 29, but here is a one-paragraph summary: there are many ways to enhance long-run returns; several can be pursued in parallel. Investors should collect risk premia from diverse sources, not just equity premia but also illiquidity premia and value, carry, and momentum style tilts. Investors can further try to exploit leverage, contrarian timing, and view-driven active management—all of which can help when used with moderation. For various caveats and much more detail, see Chapters 28 and 29.

One contribution of this book is to take return measurement seriously. Estimating prospective returns is hard enough without misinterpreting available data. We need to evaluate critically the published historical returns of any asset class or strategy (chapters on equity premium, alternatives, and dynamic strategies focus on various biases and data problems). And when *ex ante* measures are available, we need to recognize their pitfalls (bond chapters stress the shortcomings of yields and spreads).

This book is long enough dealing with expected returns without venturing into the art and science of portfolio construction and risk management. Volatility and correlations are traditional building blocks in those endeavors. I touch on these topics insofar as they influence expected returns. Intriguingly, they do, through the monetized benefits of diversification and rebalancing (see Chapter 28). Leverage can improve effective diversification, besides helping investors avoid overpriced high-volatility assets. Diversification can also be enhanced by using the complementary perspectives of strategy styles and risk factors. For example, as value and momentum strategies tend to be negatively correlated, combining them gives much smoother returns than either style alone. Negatively correlated return sources are such powerful diversifiers that their usefulness should not be wasted. It is much harder to diversify away the directional equity market risk, as safe haven assets tend to be either costly or unstable.

Striving to build a bridge between academic and practitioner worlds, this book focuses on intuition and contains almost no equations and only very basic statistics [7]. For many academics the book will thus seem insufficiently rigorous, while for some practitioners it may be too intense. My target audience, unsurprisingly, is in the middle: experienced professional investors still hungry to learn, including top-down asset allocators and fund trustees—as well as advanced finance students in CFA or MBA programs.

Outline

When designing the book’s structure, I needed to find a compromise between discussing broad issues common to many asset classes and providing evidence on specific asset classes, strategies, or factors. I decided to do both, while trying to avoid repetition. Parts I and III are broad while Part II focuses on specific cases. As the book’s structure is complex, the elephant and the cube may help as visual aids.

In Part I, the Introduction is followed by an empirical appetizer focusing on historical average returns (Chapters 2 and 3). Thereafter I present various key concepts as well as the theory of expected return determinants—both rational and irrational stories (Chapters 4 through 7).

In Part II, the main meat of this book (Chapters 8 through 19), I drill into the expected returns of 12 “cases”: four asset classes, four popular active strategies, and four underlying risk factors. Figure 1.4 redraws the cube (from Figure 1.2, of three perspectives to investments: asset classes, strategy styles, and risk factors) with each side split into four parts according to the dozen cases. Besides the traditional asset class premia—equity, bond duration, and credit—I discuss a variety of alternative asset premia. The four active styles—equity value, currency carry, commodity momentum or trend, and volatility selling—have been popular because they have been among the most successful trading strategies in recent decades. There are many nominees for underlying factors; my subjective picks are growth, inflation, liquidity, and tail risks (volatility, correlation, and return asymmetry). I will show that all 12 investment approaches have enhanced long-run returns in the past. I believe that all of them will continue to deliver excess returns, albeit in a time-varying fashion.

While Part II discusses expected returns in the context of each distinct case, Parts I and III cover topics common to all or most cases. Recalling the analogy to the elephant parable, investors who study expected returns from a single vantage point can miss the big picture. To remedy this problem, Parts I and III try to shine light on expected returns

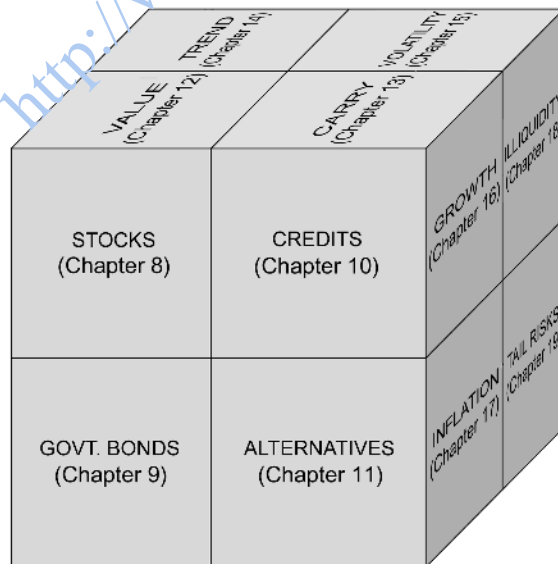


Figure 1.4. The cube in detail: Asset classes, strategy styles, and underlying risk factors.

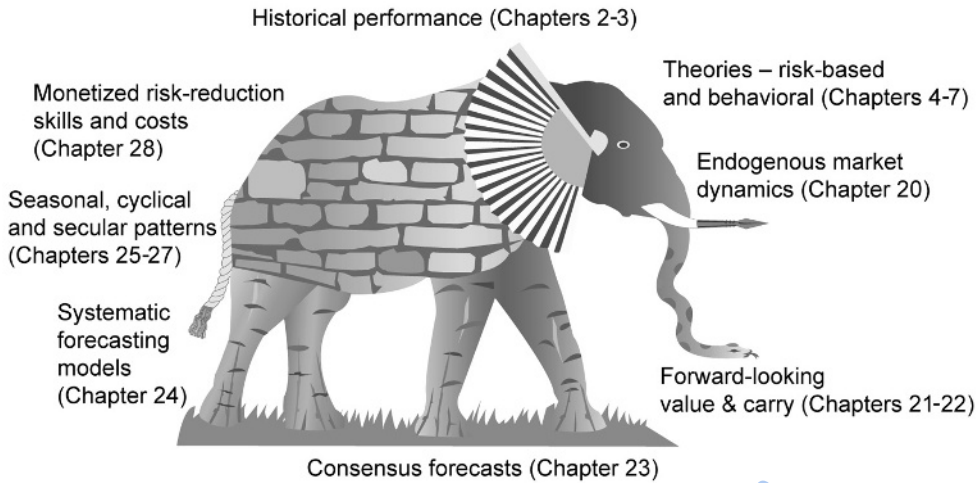


Figure 1.5. The elephant in detail: Structure of this book's broader chapters.

from different directions (as visualized in Figure 1.5). As emphasized above, historical performance, theories, and forward-looking indicators are the most important systematic inputs.

Chapter topics in Part III include endogenous return effects; forward-looking value and carry measures; usefulness of survey data; tactical forecasting models; as well as seasonal, cyclical, and secular return patterns. The book closes with main investment lessons and two appendices: a section on world wealth (size of main asset classes) and a description of data series and data sources [8].

Given the book's ambitious scope, it may be too much to absorb in one reading. To allay this problem, each chapter is reasonably self-contained and the reader can cherry-pick the topics of interest.

Now, let us turn to Poet Saxe and this chapter's concluding reflections:

*And so these men of Hindostan
Disputed loud and long,
Each of his own opinion
Exceeding stiff and strong,
Though each was partly in the right,
And all were in the wrong!*

In an afterword, often omitted from recitations of his poem, Saxe reveals his hidden agenda: he is lampooning those (and there were many in his time) who engage in meaningless disputes about theology:

Moral:
*So oft in theologic wars,
The disputants, I ween,
Rail on in utter ignorance
Of what each other mean,
And prate about an Elephant
Not one of them has seen!*

There are enough theological disputes about finance and investing. Like many writers, I too have a preacher's passion, but I preach in an ecumenical church. This book stands against narrow-mindedness, inflexibility, and overconfidence in investing, and for humility, pragmatism, and diverse perspectives.

Despite such lofty goals, I hope you enjoy the read, learn a lot, and eventually find that the insights in this book make you a better investor.

1.6 NOTES

- [1] I endorse greater use of survey data to help interpret market pricing. High stock market valuations could reflect optimistic cash flow growth forecasts or low discount rates while steep yield curves could reflect the market's view of rising short rates or a high required bond risk premium. Survey data can help make these decompositions *if* consensus forecasts are deemed representative of market views. Survey-based analyses of stock, bond, and currency prices often support irrational explanations for asset return predictability instead of time-varying risk premia.
- [2] When discussing hedge funds (Section 11.4) I review the debates about alpha, (traditional) beta, and alternative beta as return sources. The boundaries are blurred. One definition of alpha is "the average return that cannot be explained by common risk factors." As more and more factors are added to models that explain fund returns, ever less scope is left for measured alpha. Yet, active managers argue that they are simply taking views against the market; if they are right they make money which should be deemed as alpha. Tensions naturally arise between these two mindsets. Investors into hedge funds are especially concerned about asymmetric strategies that involve selling various forms of tail risk insurance whose payoffs can look deceptively alpha like. If the fund manager's "view" is that the stock market will not fall by more than 10% in any month (or that the real estate market will not fall in nominal terms or that yet another rare event will not materialize), even a manager without any forecasting skill can be profitable and collect fees for years before the tail event with large losses occurs.
- [3] Every investing institution can debate (i) whether dynamic investment approaches—such as market timing, value tilt, or factor-based investing—are appropriate for it and (ii) whether these approaches should be coded in the benchmark or left for the active manager in the quest for outperformance. These questions are not so different from asking whether emerging market stocks, commodity futures, or hedge funds should be included in their allowable investment universe and even into the benchmark. The answers will certainly vary across institutions, depending on prior beliefs, resources, costs, and other considerations.
- [4] These masterworks belong on every serious investor's bookshelf. Books by DMS and Ibbotson (including work with various coauthors) provide more underlying data than mine does; indeed, I use their data in some of my analyses. Both focus rather exclusively on historical average and period-to-period (say, annual) returns on traditional asset classes, though the authors have elsewhere expanded empirical analysis to other asset classes and investment strategies. My book distinguishes itself by its comprehensive coverage of asset classes and strategies as well as by its many perspectives to tackling expected returns. I also embrace "new" ideas, such as time-varying expected returns and investor irrationality, more than these other books do.
- [5] Selectivity cannot be avoided. I emphasize some of my pet themes that are not yet part of the academic consensus, such as the impact of wealth-dependent risk aversion and lottery-type preferences on asset prices, the promise in market and/or factor timing, or the usefulness of survey data to assess real-time investor expectations. If any personal bias shines through more than the others, it is my preference for simple and liquid assets. Such assets are more

transparent, often leading to better outcomes for end-investors. Sunlight is the best disinfectant, protecting investors against abuse.

- [6] In competitive markets, realized returns reflect much more variability than expected returns. Yet, humans have a tendency to attribute any good past performance to skill or other persistent edge. We repeatedly get “fooled by randomness” when we equate *ex post* success with *ex ante* skills and underestimate the role of chance. This is true in many realms of life but especially with investing.
- [7] Frustratingly for academic readers, I rarely show standard errors, *t*-statistics, or the statistical significance of my findings. This partly reflects my target audience, and partly my view that the time-varying nature of expected returns and various biases make standard statistical inferences inappropriate. I prefer to assess the consistency of a return series “in investment language” by reporting the Sharpe ratio (which is closely related to statistical significance) and by displaying cumulative performance graphs that I find particularly informative for experienced users.
- [8] Personally, I love footnotes. I would also prefer to give too many credits and literature references in the text, explaining the intellectual history of each key idea. Finally, I was brought up to carefully document my data series construction. I have been advised that I am in a minority on all three counts. Thus, I try to shorten the book and improve its readability by minimizing notes (now “only” about 100 left), placing them at the end of each chapter. I make some references in the main text on the sources of ideas or empirical findings, but a longer list of references can be found at the end of the book. My data sources are only briefly listed under each exhibit, but Appendix B describes my data sources and data series construction in detail.

Source notes. Although I make some references in the main text, I leave most of them for the “Source notes” section at the end of each chapter. The reference section proper can be found at the end of the book. Given the wide-ranging topic of this book, even these source notes must be selective. On many topics, I refer to important recent works rather than to seminal works. Even if the new working papers are often specialized and have not been tested by time, interested readers can find in them references to both other recent works and the intellectual heritage of the idea.

Books closest to this work are Ibbotson–Brinson (1993), Siegel (1994), and Dimson–Marsh–Staunton (2002). This book is intended for professional investors and assumes much prior knowledge. For professionals wanting to learn about institutions, products, and analytical tools in diverse investment markets, I recommend the various handbooks edited or written by Frank Fabozzi. For retail investors, I recommend William Bernstein (2002, 2009), John Kay (2008), and Malkiel–Ellis (2010). Among finance textbooks, I recommend Bodie–Kane–Marcus (2008) for MBA level and Cochrane (2005a) for Ph.D. level, while the history of the interaction between academic and practitioner finance is best covered in Peter Bernstein’s books *Capital Ideas* and *Capital Ideas Evolving*.

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