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Introduction

This book is about the trading strategies used by sophisticated investors such as hedge funds. It shows how to implement the key trading strategies and explains why they work and why they sometimes don't.[1] The book also includes interviews with some of the best hedge fund managers, who successfully developed and traded these strategies. Finally, looking through the lens of these trading strategies, the book shows how financial markets operate and how securities are priced in an efficiently inefficient way, as seen in Overview Table I.

Hedge funds have always been highly secretive, often so secretive that their own investors have only a vague idea about what strategies the funds pursue. The secret nature of the strategies has justified high fees and reduced entry into the industry. This book puts the main hedge fund strategies out in the open. It demystifies the trading universe by describing the most important strategies, how to evaluate trading strategies, how to trade them, how to manage their risk, and how to come up with new ones.

To really understand each hedge fund strategy and bring it to life, I include interviews with one of the world's pioneers and leading hedge fund managers in each style, as seen in Overview Table II. We learn how star "Tiger Cub" Lee S. Ainslie picks stocks based on the methods he started honing working for the legendary Julian Robertson at Tiger Management. The famous short seller Jim Chanos explains how he bets against companies with flawed business plans and fraudulent managers and how he uncovered Enron before its collapse. Quant pioneer Cliff Asness discusses how his computer models buy and sell thousands of securities and how he turned his academic finding of the momentum effect into a real-world investment strategy as a complement to value and other factors. George Soros, who "broke the Bank of England," talks about his big macro bets and his ideas about the evolution of markets. David Harding discusses how he developed a systematic trend-detection system and how trends defy traditional notions of market efficiency. Myron Scholes explains how he traded on his Nobel Prize–winning insights in the fixed-income markets. We hear how Ken Griffin started trading convertible bonds out of his Harvard dorm room and how he grew from "boy king" to running a large firm. Finally, John Paulson describes his methods for merger arbitrage and event-driven investment, including his famous subprime "greatest trade ever."

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[1] This book provides an academic treatment of investments, not investment advice. When I say that a trading strategy "works," I use the word like finance academics and asset managers, namely to mean that they have historically produced positive average returns and may have a chance of outperforming on average in the future, but not always, not without risk, and the world can change. As Cliff Asness has said, "If your mechanic used the word 'work' to mean that your car might work 6–7 years out of 10, then you would fire your mechanic, but this is how asset management tends to 'work.'"

The managers I interviewed shine with true brilliance, and the hedge fund world has often been known as a mysterious realm in which genius managers deliver outsized returns by sheer magic. However, rather than being based on magic, I argue that much of the world of hedge fund returns can be explained by a number of classic trading strategies that work for good reasons. There exist many more hedge funds than unique hedge fund strategies in the world. If hedge fund returns are not just about magic, then the main hedge fund strategies can be learned and understood. This book teaches the general principles. To be successful in the long term, a hedge fund needs a repeatable process that makes money more often than not. This book explains many of these processes based on the lessons of top managers. Of course, putting this knowledge into action requires a lot of work, even more discipline, capital, brainpower, and trading infrastructure. Only those who master all the required skills can reap the benefits in an efficiently inefficient market.

Although the different trading strategies and the different hedge fund gurus invest in very different markets and asset classes using different methods, there are nevertheless some common overarching principles that I call "investment styles." I discuss the key investment styles and show how many investment strategies and hedge fund gurus rely on value investing, trend-following investing, liquidity provision, and a few other key styles described in Overview Table III. These styles are general enough to work across asset classes and markets, even though their specific implementations (and the words used to describe them) differ across markets and investors.

The book also shows how securities are priced and how markets operate, but not as in traditional academic finance books. Whereas traditional finance books typically write some equation for the value of a bond or a stock and claim that this is how the security is priced because this is what the theory says, this book seriously analyzes the possibility that the market price can differ from the theoretical value and what to do about it. A discrepancy between the market price and the theoretical value has two possible interpretations: (1) It presents a trading opportunity, where you buy if the market price is below the theoretical value and sell otherwise; if such opportunities arise repeatedly, which can happen for reasons we discuss in detail, they give rise to a trading strategy; (2) The discrepancy can reflect that your theoretical value is wrong. How do you know if the truth is one or the other? You implement the trading strategy—in live trading or in a simulated backtest—and, if you make money, it's (1) and, if you lose, it's (2).

In other words, the book's premise is that trading strategies present natural tests of asset pricing theories and, vice versa, asset pricing theories naturally give rise to trading strategies. The book shows how finance theory can be translated into trading ideas and how trading results can be translated into finance theory.

I. EFFICIENTLY INEFFICIENT MARKETS

To search for trading strategies that consistently make money over time, we need to understand the markets where securities are traded. The fundamental question concerning financial markets is whether they are *efficient*, a question that remains hotly debated. For instance, the Nobel Prize in economics in 2013 was awarded jointly to Eugene Fama, the father and defender of efficient markets, Robert Shiller, the father of behavioral economics, and Lars Hansen, who developed tests of market efficiency.[2] As seen in Overview Table I, an efficient market, as defined by Fama, is one where market prices reflect all relevant information. In other words, the market price always equals the fundamental value and, as soon as news comes out, prices immediately react to fully reflect the new information. If markets are fully efficient, there is no point in active investing because the prices already reflect as much information as you could hope to collect. But without active investors, who would make the market efficient in the first place? Further, given that investors are paying billions of dollars in fees to active managers, either the securities markets are inefficient (so active managers can outperform) or the market for asset management is inefficient (because investors would pay fees for nothing)—it is logically impossible that all these markets are fully efficient.[3]

Shiller, on the other hand, believes that security market prices deviate from fundamentals because people make mistakes and are subject to common biases that do not cancel out in aggregate. Humans make errors: they panic, herd, and get exuberant. But, if most investors were completely naïve and market prices had little relation to fundamentals, then shouldn't beating the market be easy? In reality, beating the market is far from easy. Most investment professionals, e.g., most mutual funds, hardly beat the market. There are lots of sophisticated money managers with large amounts of capital who compete vigorously to achieve the best investment performance, and they make markets more efficient when they buy low and sell high.

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[2] Testing whether the market is efficient is difficult since most tests must rely on a specific asset pricing model. Hence, observing anomalous returns is a rejection of the "joint hypothesis," meaning that either the market is not efficient or the asset pricing model is wrong, but not necessarily both. However, observing two securities with equal cash flows trading at different prices (i.e., an arbitrage) is a rejection of frictionless efficient markets.

[3] Grossman and Stiglitz (1980) showed that the theory of efficient markets entails a paradox since investors must have an incentive to collect information. They concluded that securities markets must entail an "equilibrium level of disequilibrium." Their point is strengthened by the fact that investors pay large fees for active management. Berk and Green (2004) propose that the market for money management is efficient while security markets are not. I argue instead that both security markets and the market for money management are efficiently inefficient, and this principle is modelled rigorously by Gârleanu and Pedersen (2018). See also Pedersen (2018) who sharpens the "arithmetic of active management."

I believe that the truth lies somewhere in between these extremes, but not just in some arbitrary middle ground. The truth is equally well-defined: the truth is that markets are *efficiently inefficient*.

Prices are pushed away from their fundamental values because of a variety of demand pressures and institutional frictions, and, although prices are kept in check by intense competition among money managers, this process leads the market to become *inefficient* to an *efficient* extent: just *inefficient* enough that active investors and their money managers can be compensated for their costs and risks through superior performance and just *efficient* enough that the rewards to money management after all costs do not encourage entry of new managers or additional investor capital.

In an efficiently inefficient market, money managers are compensated for providing a service to the market, namely providing liquidity—just like burger bars are compensated for the service of combining meat, salad, and buns and delivering a burger in a convenient location. Burger bars' profits reflect their efficiently inefficient competition in light of their costs, just like the money managers' outperformance reflects the efficiently inefficient price of liquidity in light of their costs and risks. The outperformance that money managers deliver to their investors after fees reflects the efficiently inefficient market for money management.

Liquidity is the ability to transact, so when money managers "provide liquidity," it means that they help other investors transact by taking the other side of their trades. Money managers profit because demanders of liquidity value the opportunity to transact at prices that are not exactly equal to fundamental values (just like you are willing to buy a burger for more than the value of the ingredients). For example, some investors trade when they need to reduce risk (e.g., hedging by commodity producers such as farmers or commodity consumers such as airlines); others need to raise money or invest it (e.g., you sell bonds to raise cash for a wedding and later invest money you received as a wedding gift, or a mutual fund needs to rebalance its portfolio because of inflows or outflows of capital); many investors desire to sell stocks going through mergers to avoid event risk; pension funds may trade to comply with regulation; banks may prefer certain securities over other similar ones because of differential capital requirements; many investors prefer not to hold illiquid securities that are difficult to trade; and some investors prefer more speculative securities that have a chance of a large return. Money managers are compensated for taking the other side of these trades and, although their fierce competition can drive the compensation close to zero, competition doesn't drive the price of liquidity all the way to zero since these trades involve risk. Active managers are also compensated for collecting and processing information about security valuations. For example, if money managers discover that a pharmaceutical firm is making particularly useful medicines, they will buy the stock. As the stock price is bid up, the pharmaceutical firm's cost of capital is lowered, allowing the firm to increase the scale of its operations. Hence, when money managers incorporate new information into prices (i.e., improve market efficiency), this process helps the real economy.

Money managers can only operate if they attract capital from investors. Naturally, investors benefit if money managers can select good securities with high returns, but investors must be aware of several costs. First, money managers charge fees for their efforts, skills, and internal operating costs (e.g., salaries to traders, computers, rent, legal fees, and auditors). Second, money managers incur transaction costs that further lower the returns received by their investors. Investors should only bear these costs and fees when they are outweighed by the profits that the manager is expected to extract from the efficiently inefficient market.

How close are prices and returns to their fully efficient values in an efficiently inefficient market? Well, because of competition, securities' returns net of all the relevant market frictions—transaction costs, liquidity risk, and funding costs—are very close to their fully efficient levels in the sense that consistently beating the market is extremely difficult. However, despite *returns* being nearly efficient, *prices* can deviate substantially from the present value of future cash flows. To understand this apparent paradox, note that the return to buying a cheap stock, say, depends both on the price today and the price tomorrow. If the price tomorrow can be even further from its efficient level and if liquidity costs are large, then the expected return may not be very attractive even if the price deviates significantly from its efficient level.

Markets constantly evolve and gravitate toward an efficient level of inefficiency, just as nature evolves according to Darwin's principle of natural selection, also called survival of the fittest. The traditional economic notion of perfect market efficiency corresponds to a view that nature reaches an equilibrium of "perfectly fit" species that cease to evolve. However, in nature there is not a single life form that is *the* fittest, nor is every life form that has survived to date "perfectly fit." Similarly in financial markets, there are several types of investors and strategies that survive and, while market forces tend to push prices toward their efficient levels, market conditions continually evolve as news arrives and supply-and-demand shocks continue to affect prices.

As in nature, many social dynamics inside and outside financial markets entail an efficient level of inefficiency. For instance, the political process can be inefficient, yet politicians have an incentive to appear efficient relative to their competition. However, the competitive forces in the political system do not make the process fully efficient because of the friction caused by voters' ability to monitor their representatives (corresponding to the frictions in financial markets). Similarly, traffic dynamics can be efficiently inefficient. For example, consider what happens when you drive on a busy highway. Each lane moves approximately equally fast because lane-switchers ensure a relatively even number of cars in each lane. However, the lanes don't move exactly equally fast because of the "cost" of switching lanes and the evolving traffic situation. Lane speeds probably tend to reach an efficiently inefficient level where switching lanes hardly helps, but doing so still makes sense for those with comparative advantages in lane switching—although frequent lane switching and high speed increase the risk of driving, just as frequent trading and high leverage increase the risk in financial markets.

The economic mechanisms of an efficiently inefficient market are fundamentally different from those of neoclassical economics, as seen in table I.1. The neoclassical principles continue to be taught ubiquitously at global universities as they constitute the fundamental pillars for our understanding of economics. While economic thinking is almost always seen in reference to these neoclassical benchmarks, the belief that these pillars constitute an accurate description of the real world has been shaken by the global financial crisis that started in 2007, by earlier liquidity crises, and by decades of research. In contrast to the Modigliani–Miller Theorem, corporations trade off the benefits of debt against the costs of financial distress, and, during liquidity crises, corporations strapped for cash must change their investment policy. While the Two-Fund Separation Theorem stipulates that all investors should hold the market portfolio in combination with cash or leverage, most real-world investors hold different portfolios, where some avoid leverage and instead concentrate in risky securities, whereas others (such as Warren Buffett) leverage safer securities. Asset returns are not just influenced by their market risk (as in the CAPM); they are also influenced by market and funding liquidity risk since investors want to be compensated for holding securities that are difficult to finance or entail the risk of high transaction costs. The Law of One Price breaks down when arbitrage opportunities arise in currency markets (defying the covered interest rate parity), credit markets (the CDS-bond basis), convertible bond markets, equity markets (Siamese twin stock spreads), and option markets. Investors exercise call options and convert convertible bonds before maturity and dividend payments when they need to free up cash or face large short sale costs (defying Merton's Rule). The financial market frictions influence the real economy, and unconventional monetary policy, such as central banks' lending facility, can be important in addressing liquidity draughts.[4]

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[4] Modigliani–Miller breaks down due to financial distress costs, taxes, and behavioral effects, see Baker and Wurgler (2012) and references therein. Calvet, Campbell, and Sodini (2007) and Frazzini and Pedersen (2014) document systematic deviations from Two-Fund Separation, where constrained individuals and mutual funds hold riskier stocks, and leveraged buyout (LBO) firms and Warren Buffett apply leverage to safer stocks. Theory and evidence suggest that required returns are influenced by transaction costs (Amihud and Mendelson 1986), market liquidity risk (Acharya and Pedersen 2005), and funding liquidity constraints (Gârleanu and Pedersen 2011). Arbitrage opportunities arise due to the limits of arbitrage (Shleifer and Vishny 1997), and specific examples are referenced throughout the book. Deviations from Merton's Rule are documented by Jensen and Pedersen (2016). Credit cycles (Kiyotaki and Moore 1997, Geanakoplos 2010) and liquidity spirals (Brunnermeier and Pedersen 2009) arise due to leverage and funding frictions. For the theoretical and empirical case for two monetary tools, see Ashcraft, Gârleanu, and Pedersen (2010) and references therein.

TABLE I.1. PRINCIPLES OF NEOCLASSICAL FINANCE AND ECONOMICS VS. THOSE IN AN EFFICIENTLY INEFFICIENT MARKET

Neoclassical Finance and Economics	Efficiently Inefficient Markets
Modigliani–Miller Irrelevance of capital structure	**Capital structure matters** because of funding frictions
Two-Fund Separation Everyone buys portfolios of market and cash	**Investors choose different portfolios** depending on their individual funding constraints
Capital Asset Pricing Model Expected return proportional to market risk	**Liquidity risk and funding constraints** influence expected returns
Law of One Price and Black–Scholes No arbitrage, implied derivative prices	**Arbitrage opportunities** arise as demand pressure affects derivative prices
Merton's Rule Never exercise a call option and never convert a convertible, except at maturity/dividends	**Optimal early exercise and conversion** free up cash, save on short sale costs, and limit transaction costs
Real Business Cycles and Ricardian Equivalence Macroeconomic irrelevance of policy and finance	**Credit cycles and liquidity spirals** driven by the interaction of macro, asset prices, and funding constraints
Taylor Rule Monetary focus on interest rate policy	**Two monetary tools** are interest rate (the cost of loans) and collateral policy (the size of loans)

II. GLOBAL TRADING STRATEGIES: OVERVIEW OF THE BOOK

Exploiting inefficiencies is challenging in an efficiently inefficient market. It requires hard work, thorough analysis, costs in setting up trading infrastructure, and opportunity costs of highly skilled people. Hence, to be a successful active investor requires specialization and often scale, so money management is usually done by managers who run pools of money such as mutual funds, hedge funds, pension funds, proprietary traders, and insurance companies. The first part of the book explains the main tools for active investment. As seen in figure I.1, we learn how to evaluate, find, optimize, and execute trading strategies.

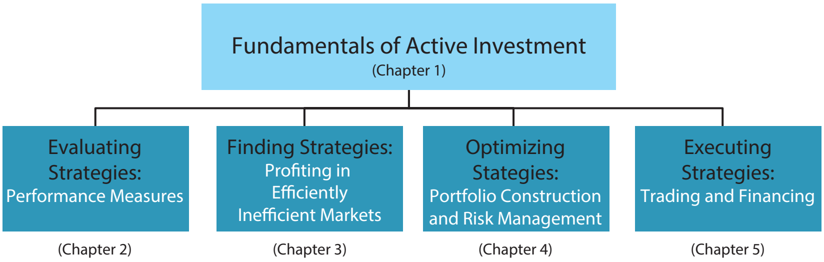
Fundamentals of Active Investment
(Chapter 1)
Evaluating Strategies: Performance Measures
(Chapter 2)
Finding Strategies: Profiting in Efficiently Inefficient Markets
(Chapter 3)
Optimizing Stategies: Portfolio Construction and Risk Management
(Chapter 4)
Executing Strategies: Trading and Financing
(Chapter 5)

Figure I.1. Fundamental tools for active investments described in this book.

The most unrestricted and sophisticated investors tend to be the hedge funds, so I focus on hedge fund strategies. While I focus on hedge funds, the strategies in the book are also the core strategies for most other active investors. One difference is that whereas hedge funds can both invest long (i.e., bet that a security increases in value) and sell short (i.e., bet that a security decreases in value), most other investors only invest long. However, the difference is smaller than you may think. A hedge fund strategy that invests in IBM and short-sells CISCO corresponds to a mutual fund that overweights its allocation to IBM (relative to the benchmark) and underweights CISCO.

At a high level, I distinguish between *equity strategies*, *macro strategies*, and *arbitrage strategies*. Equity hedge funds invest primarily in stocks, macro hedge funds invest primarily in overall markets (e.g., currencies, bonds, equity indices, and commodities), and arbitrage funds primarily make relative-value bets across pairs of related securities. I subdivide these three broad types of trading strategies, as seen in figure I.2, which also shows the structure of the

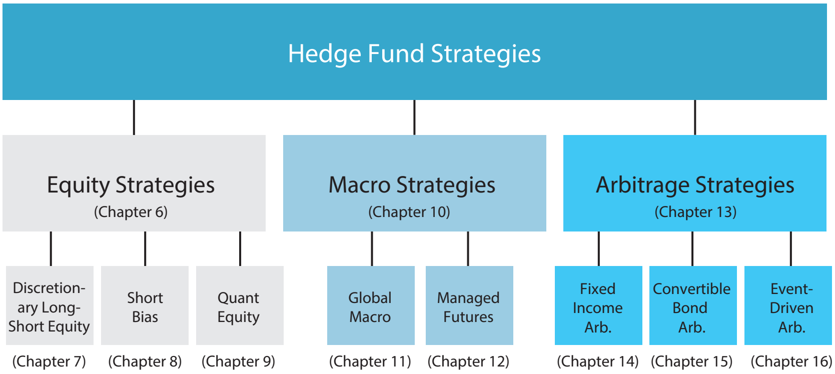
Hedge Fund Strategies
Equity Strategies
(Chapter 6)
Macro Strategies
(Chapter 10)
Arbitrage Strategies
(Chapter 13)
Discretionary Long-Short Equity
(Chapter 7)
Short Bias
(Chapter 8)
Quant Equity
(Chapter 9)
Global Macro
(Chapter 11)
Managed Futures
(Chapter 12)
Fixed Income Arb.
(Chapter 14)
Convertible Bond Arb.
(Chapter 15)
Event-Driven Arb.
(Chapter 16)

Figure I.2. Classic hedge fund strategies analyzed in this book.

rest of the book.[5] Each chapter is self-contained and can be read independently. For instance, readers most interested in event-driven investment can jump directly to chapter 16 (and use the fundamental chapters 1–5 as a reference).

Equity Strategies

I subdivide equity strategies into *discretionary long–short equity, dedicated short bias*, and *quant equity*. Discretionary long–short equity managers typically go long or short stocks based on a fundamental analysis of the value of each company, comparing its profitability to its valuation and studying its growth prospects. These fund managers also analyze the quality of the company's management, traveling to meet managers and see businesses. Furthermore, they study the accounting numbers, trying to assess their reliability and to estimate future cash flows. Equity long–short managers mostly bet on specific companies, but they can also take views on whole industries.

Some equity managers, called value investors, focus on buying undervalued companies and holding these stocks for the long term. Warren Buffett is a good example of a value investor. Implementing this trading strategy often requires being contrarian, since companies only become cheap when other investors abandon them. Hence, cheap stocks are often out of favor or bought during times when others panic. Going against the norm is harder than it sounds, as traders say:

> It's easy to be a contrarian, except when it's profitable.

Another approach is to try to exploit shorter term opportunities, for example, to try to predict a company's next earnings announcement better than the rest of the market. If you think the earnings will come out higher than others expect, you buy before the announcement and sell after the announcement. More generally, such opportunistic traders try to put on a position before something is broadly known and unwind the position when the information gets incorporated into the price based on the motto:

> Buy on rumors, sell on news.

If you know a rumor to be true, then you could be engaging in illegal insider trading (as Gordon Gekko, played by Michael Douglas, in the movie *Wall Street*).

Whereas equity long–short managers often have more long positions than short, the reverse is true for dedicated short-bias managers. They use similar techniques as equity long–short managers, but they focus on finding companies to sell short. Short-selling means taking a bet that the share price will go down. Just like buying a stock means that you profit if the stock price goes up, taking a short position means that you profit if the price goes down. In practice, short-selling is implemented by borrowing a share and selling it for its current price, say, \$100. At a later time, say, the next day, you must buy back the share and return it to the lender. If the stock price has gone down to \$90, you buy it back cheaper than you sold it and earn the difference, \$10 in this example. If the price has gone up, you lose money.

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[5] There are many ways to classify hedge funds, varying across hedge fund indices and databases. My classification of substrategies is similar to that of the Credit Suisse Hedge Fund Indexes, and it also shares similarities with most other classifications.

Dedicated short-bias managers look for companies that are going down, searching for hotels where all the rooms are empty, pharmaceutical companies with drugs that no doctors prescribe (or with new risks), or companies based on fraud or misrepresented accounting. Since stocks go up more often than they go down (called the equity risk premium), dedicated short-bias managers are fighting against the general uptrend in markets, and, perhaps for this reason, they comprise a very small group of hedge funds (anecdotally consisting of pessimistic managers).

Almost all equity long–short hedge funds and dedicated short-bias hedge funds (and most hedge funds in general) engage in *discretionary trading*, meaning that the decision to buy or sell is at the trader's discretion, given an overall assessment based on experience, various kinds of information, intuition, and so forth. This traditional form of trading can be viewed in contrast to *quantitative investment*, or "quant" for short. Quants define their trading rules explicitly and build systems that implement them systematically. They try to develop a small edge on each of many small diversified trades using sophisticated processing of ideas that cannot be easily processed using nonquantitative methods. To do this, they use tools and insights from economics, finance, statistics, mathematics, computer science, and engineering, combined with lots of data to identify relations that market participants may not have immediately fully incorporated in the price. Quants build computer systems that generate trading signals based on these relations, carry out portfolio optimization in light of trading costs, and trade using automated execution schemes that route hundreds of orders every few seconds. In other words, trading is done by feeding data into computers that run various programs with human oversight.

Some quants focus on high-frequency trading, where they exit a trade within milliseconds or minutes after it was entered. Others focus on statistical arbitrage, that is, trading at a daily frequency based on statistical patterns. Yet others focus on lower frequency trades called fundamental quant (or equity market neutral) investing. Fundamental quant investing considers many of the same factors as discretionary traders, seeking to buy cheap stocks and short sell expensive ones, but the difference is that fundamental quants do so systematically using computer systems.

While discretionary trading has the advantages of a tailored analysis of each trade and the use of soft information such as private conversations, its labor-intensive method implies that only a limited number of securities can be analyzed in depth, and the discretion exposes the trader to psychological biases. Quantitative trading has the advantage of being able to apply a trading idea to thousands of securities around the globe, benefiting from significant diversification. Furthermore, quants can apply their trading ideas with the discipline of a robot. Discipline is important for all traders, but as the saying goes,

> Have a rule. Always follow the rule, but know when to break it.

Even quants sometimes need to "break the rule," for example, if they realize that there are problems in the data feed or if sudden important events happen that are outside the realm of the models, such as the failure of the investment bank Lehman Brothers in 2008.

Quants also have the advantage of efficient portfolio construction and the ability to "backtest" strategies, meaning that one can simulate how well one would have done by following such a strategy in the past. Of course, past success does not guarantee future success, but at least it eliminates using rules that never worked. Furthermore, systematic investment reduces the effects of psychological biases, at least to a degree. The quant method's disadvantage is its reliance on hard data and the computer program's limited ability to incorporate real-time human judgment.

Whether using discretionary trading or quant methods, learning the analytical tools is useful, and this book aims to provide such tools. Full disclosure: I am a quant. That said, I believe that the methods described in this book are essential for all managers, whether discretionary or quantitative. Indeed, many serious discretionary traders often analyze the historical performance of a trading idea before implementing it in large size. For example, in my interview with Lee Ainslie, he told me how his Maverick Capital has built a quantitative system that informs their fundamental process and helps manage the risk.

Macro Strategies

If Gordon Gekko was an equity trader in the movie *Wall Street*, the Duke brothers and Eddie Murphy were macro traders in the movie *Trading Places*, using futures markets to bet on the direction of orange juice prices. I divide macro strategies into *global macro* and *managed futures*. Global macro traders bet on economy-wide phenomena around the world. They take the view that the overall stock market will go up or down, that inflation will lead to a spike in gold prices, or that emerging-market currencies will rise or collapse. Some global macro traders take large positions, as is clear from the following quote from Stanley Druckenmiller, who learned it from Georges Soros (Schwager 2008):

> When you have tremendous conviction on a trade, you have to go for the jugular. It takes courage to be a pig.

Others go for a more diversified and risk-managed approach, arguing instead,

> Bulls get rich, bears get rich, but pigs get slaughtered.

According to this saying, you can make money taking long positions (bulls) or taking short positions (bears), but if you don't control your risk (pigs), you end up going out of business. In my interview with George Soros, he explains that he too puts significant emphasis on risk management, but he feels that one should go for the jugular in the rare cases when the upside is large and the downside is limited.

The differences between these sayings reflect the great variation across global macro traders. They come from a variety of backgrounds, ranging from traders with little formal training in economics to former central bank economists. They apply a range of different approaches, some analyzing data, others following every move of central banks, yet others traveling the world for global trading ideas. Some global macro funds are thematic traders, meaning that they focus on a few themes and express each theme in terms of various trades. For instance, one theme might be that China will continue to grow at an explosive rate, and the global macro trader might express this view by buying Chinese stocks or commodities imported by China or companies or industries selling to China.

Though global macro traders are very different from one another, there are similarities. For instance, macro traders often like to express their views in a way that earns a positive carry, meaning that they earn income even if nothing changes. Hence, whether they do so intentionally or not, they often have exposure to so-called carry trades, in particular the currency carry trade. The currency carry trade involves investing in currencies with high interest rates while shorting currencies with low interest rates. This strategy earns an interest rate differential, essentially borrowing one currency at low interest and investing in another currency with a higher interest rate, but it is exposed to the risk that the relative values of the currencies can change.

Managed futures investors (also called *commodity trading advisors, CTAs*) trade many of the same securities as global macro traders: bond futures, equity index futures, currency forwards, and commodity futures. Managed futures investors often focus on finding price trends, buying instruments that are trending up, and shorting instruments that are trending down. For instance, if gold prices have been rising, a managed futures hedge fund may buy gold futures, betting that the price will continue to rise, relying on the maxim that

> The trend is your friend.

Managed futures hedge funds focus on price data, using statistical methods (managed futures quants) or using rules of thumb (technical analysis) more than they look at fundamental data. Managed futures investors then try to identify trending markets, trends that have become overextended, or snapbacks caused by countertrends. The philosophy is that trends start as people underreact to news. By the time prices catch up to fundamentals, they have been moving in the same direction for a while, and other traders may start herding into the position, leading to a delayed overreaction followed by an eventual reversion. Rather than following the news, managed futures investors focus on prices and go by the saying,

> Show me the charts, I'll tell you the news.

Risk management is central for managed futures investors, who apply a very different philosophy than the global macro view expressed by George Soros above. When managed futures investors lose money, it is often because the trend is switching direction and, in this case, they flip their position and get ready to ride the new trend.

Arbitrage Strategies

Turning to arbitrage strategies, these consist of *fixed-income arbitrage, convertible bond arbitrage*, and *event-driven investment*. Fixed-income arbitrage is based on a number of so-called convergence trades. In a convergence trade, you look for similar securities with different prices; then you buy low, sell high, and hope for convergence. Since fixed-income securities usually have a finite maturity, convergence must eventually happen, but the sooner it happens, the more profitable the trade. The biggest risk in convergence trades is that the trader is forced to unwind the trade when the price gap widens and the trade loses money. As the saying goes:

> The markets can remain irrational longer than you can remain solvent.

Typical examples of fixed-income arbitrage trades include on-the-run versus off-the-run Treasury bonds, yield curve trading, betting on swap spreads, mortgage trades, futures-bond basis trades, and trades on the basis between bonds and credit default swaps (CDS).

Another classic arbitrage trade is convertible bond arbitrage. Convertible bonds are corporate bonds that can be converted into stock at a prespecified conversion ratio. A convertible bond can be viewed as a package of a straight corporate bond and a call option on the company's stock. Using option pricing techniques, the convertible bond value can be computed as a function of the company's stock price and volatility. This theoretical value of the convertible bond tends to be above the market price because convertible bonds can be very hard to sell quickly and therefore investors need to be compensated for the inherent liquidity risk. Convertible bond arbitrage consists of buying cheap convertible bonds and hedging the risk by shorting stocks and possibly using additional hedges.

Finally, event-driven hedge funds try to exploit opportunities that arise around corporate events. The classic trade is merger arbitrage (also called risk arbitrage). In a corporate takeover, the acquirer makes a bid for the target stock above the current price to get investors to tender their shares. The stock price shoots up on the announcement but usually not all the way to the bid price. The difference reflects the risk of deal failure, but it also reflects that many investors sell their shares shortly after the announcement. Merger arbitrage managers buy the target company, typically after the announcement and after the initial price jump (unless they had the insight that this was a likely merger target in advance) and hope to earn the difference between the target stock price and the merger offer. The opposite corporate event of a merger is a spin-off or a split-off, where one company becomes two. This event also presents opportunities for event managers. Event managers trade a variety of corporate securities, not just stocks, but also corporate bonds and loans, for instance. Relative value trades across different securities issued by the same company are called capital structure arbitrage. Some event managers focus on distressed companies and may play an active role on the company's creditor committee, trying to turn the company around.

III. INVESTMENT STYLES AND FACTOR INVESTING

Although the different investment strategies are pursued in disperse asset classes by different types of managers, I nevertheless argue that there exist some pervasive investment "styles" that transcend these boundaries. I define an investment style as a method for deciding on what to buy and what to sell that can be applied broadly across asset classes and markets, as seen in Overview Table III.

The broad applicability of style investment means that it can be implemented systematically, which is called "factor investing." For instance, we study investment factors such as the value factor and the momentum factor. Whereas style investment lends itself well to factor investment, we shall see that there are many approaches—factor based and discretionary—to earning their rewards.

As a case in point, most of the managers whom I interviewed for this book use some version of value investing (buying cheap securities and selling expensive ones) and momentum investing (buying securities whose price has been rising while selling falling ones). Table I.2 includes brief quotes from each of my interviews related to value and momentum, although each of the hedge fund gurus calls it different things. As Asness's quote shows, value and momentum are clearly central in his investment strategy, and he had the insight

TABLE I.2. VALUE AND MOMENTUM EVERYWHERE

Expert Interviewed in This Book	Quotes Related to Value and Momentum
Lee Ainslie	The most common valuation metric at Maverick is the comparison of sustainable free cash flow to enterprise value [. . .] It's certainly important to be attuned to short-term expectations as well.
James Chanos	Kynikos Associates specializes in short selling, an investment technique that profits in finding fundamentally overvalued securities that are poised to fall in price. [. . .] Even if we love a position, if it's going against us, we'll trim it back.
Cliff Asness	We're looking for cheap stocks that are getting better, the academic ideas of value and momentum, and to short the opposite, expensive stocks that are getting worse.
George Soros	I developed this boom/bust theory [. . .] A bubble is when a situation moves from near-equilibrium to far-from-equilibrium. So, you've got these two strange attractors where the whole thing is an interplay between perceptions and the actual state of affairs.
David Harding	Trends are what you're looking for.
Myron Scholes	Most of the fixed-income business is a negative-feedback-type business unless you're directional, which is positive feedback, or trend following.
Ken Griffin	I started to view the markets through the lens of relative value trading.
John Paulson	The target stock runs up close to the offer price but trades at somewhat of a discount to the offer price because of the risks of failure of deal completion.

Source: Interviews in this book and statement by Chanos to the SEC, May 15, 2003.

that value and momentum strategies can be applied everywhere: in any asset class, you buy cheap assets that are trending up and short expensive assets that are coming down.[6] Soros focuses on boom–bust cycles, but, when he rides a bubble, this is essentially momentum trading, and when he decides that a bubble is bursting as the economy moves closer to equilibrium, he is a value investor. Scholes talks about how fixed-income arbitrage is often based on negative-feedback trading, where one bets on mean reversion, i.e., a form of value investing, complemented by positive-feedback trading, betting on trend continuation. Ainslie and Chanos focus on fundamental value investing, but also consider short-term dynamics, which are often momentum based. Harding is one of the original systematic trend followers in the futures markets, whereas Griffin and Paulson look for relative value opportunities.

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[6] See Asness, Moskowitz, and Pedersen (2013).

Another investment style (as seen in Overview Table III) is liquidity provision, meaning buying securities with high liquidity risk or securities being sold by other investors who demand liquidity. This investment style comes in many shapes and forms, from Griffin buying illiquid convertible bonds to earn a liquidity risk premium, to Paulson buying merger targets being dumped by investors who demand liquidity for fear of event risk, to Soros riding a credit cycle, to Asness providing liquidity through statistical arbitrage trades.

Carry trading is the investment style of buying securities with high "carry," that is, securities that will have a high return if market conditions stay the same (e.g., if prices do not change). For instance, global macro investors are known to pursue the currency carry trade where they invest in currencies with high interest rates, bond traders often prefer high-yielding bonds, equity investors like stocks with high dividend yields, and commodity traders like commodity futures with positive "roll return."

Low-risk investing is the style of exploiting the high risk-adjusted returns of safe securities. This investment style is done in several different ways across various markets. Low-risk investing can be done as a long–short equity strategy, buying safe stocks with leverage while shorting risky ones, also called "betting against beta." Low-risk investing can also be done as a long-only equity strategy, buying a portfolio of relatively safe stocks, also called defensive equity. Low-risk investing can also be applied as an asset allocation strategy called risk parity investing, and has also worked in fixed-income markets.

Lastly, quality investing is the style of buying high-quality securities, for instance, profitable, stable, growing, and well-managed companies, while shorting low-quality securities. High-quality securities naturally have higher average prices than corresponding low-quality ones, so quality investment goes hand-in-hand with value investing as investors seek securities that are cheap relative to their quality.

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