Praise for *Dual Momentum Investing*

This is an excellent book on the various forms of price momentum: why they work, including a ve clever way to use them. I highly recommend investors read this book.

—James P. O'Shaughnessy, author, *What Works on Wall Stree*
Chairman and CEO, O'Shaughnessy Asset Manageme

Gary Antonacci takes us on a comprehensive tour of investment methods, exploring their strengt and weaknesses, and lays out a strong case for combining absolute and relative momentum. I consid *Dual Momentum Investing* an essential reference for system designers, money managers, a investors.

—Ed Seyko

I was familiar with Antonacci's writing talent when he won first place in the 2012 NAAIM Wagne Paper contest, which I chair. *Dual Momentum Investing* is a treasure of well-researched momentu driven investing processes. After a thorough and enlightening review of historical momentum writin and a brief, critical review of modern portfolio theory, he clearly shows a number of different metho that anyone who is serious about a long-term strategy will find easy to implement. This is one of tho five-star books; it is logical and easy to grasp.

—Gregory L. Morris, Chief Technical Analy
and Investment Committee Chairma
Stadion Money Management, LLC; author, *Investing with the Tre*

In *Dual Momentum Investing*, Gary Antonacci presents a clear and scholarly sound case for t success of a simple momentum-based strategy. It is easy to implement, yet its quantitative natu helps you avoid your own behavioral biases. Give it a try; you'll be hooked!

—John Nofsinger, PhD, Seward Chair of Financ
University of Alaska Anchorage; author, *The Psychology of Investi*

Gary Antonacci's *Dual Momentum Investing* is what happens when "Ed Thorpe's *Beat the Deal* meets Seth Klarman's *Margin of Safety*." *Dual Momentum* presents a thoughtful and tantalizing " what you know and know what you're doing" investment process. This is an ambitious and must-ha book.

—Claude Erb, retired Managing Director, TCW Group, In

This is a must-read for both individual investors as well as financial advisors. It will forever chan the way you think about developing investment and asset allocation strategies.

—Dr. Bob Froehlich, retired Vice Chairman, Deutsche Asset Manageme

Gary Antonacci provides a fantastic and valuable viewpoint of dual momentum investing. This book ~~highly informative, substantive, and readable for the sophisticated investor. Gary presents~~ a wel crafted balance between academic findings and application of this emerging topic.

—Victor Ricciardi, Coeditor, *Investor Behavio*
The Psychology of Financial Planning and Investi

Few authors can review the breadth of competing investment theories and practices in such accessible manner. Even fewer can make their own contributions. Gary Antonacci's *Dual Momentu Investing* achieves both.

—Jerry Waldron, PhD, former Assistant Profess
of Finance, University of Memph
and Assistant Professor of Management, New York Universi
Stern School of Busine

Gary Antonacci's book *Dual Momentum Investing* opens up a secret world—the power of momentu investing—that has been hidden in plain sight for decades.

—Kurt Brouwer, Chairman, Brouwer & Janachowski, LL

DUAL MOMENTUM INVESTING

AN INNOVATIVE STRATEGY FOR HIGHER RETURNS WITH LOWER RISK

GARY ANTONACCI

McGraw Hill Education

New York Chicago San Francisco Athens London
Madrid Mexico City Milan New Delhi
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FOREWORD

Eugene Fama, the 2014 corecipient of the Nobel Prize in Economics and father of the efficie market hypothesis, has three words to describe momentum: “momentum is pervasive.” This is r small admission from Dr. Fama. Yet, despite momentum being pervasive, it remains largely, an perhaps curiously, misunderstood by investors. Thankfully, we have Gary Antonacci to fill this voi Gary’s *Dual Momentum Investing* is a true “pracademic” masterpiece, bridging the gap betwe academics, who have explored the nuanced theoretical mechanics of the momentum anomaly in den academic journals, and practitioners who have used their vague knowledge of momentum in an ad-h way to generate excess returns. Gary brings to bear his expertise in both spheres, creating momentum-based asset allocation strategy that is robust, simple, implementable, and has historical earned an outsized risk-adjusted return.

You could be forgiven for being skeptical, as I once was, about the merits of Gary’s Du Momentum Investment philosophy. After all, there are many second-rate or even wholly ineffectu efforts to capture momentum. And as any empirical researcher can tell you, “trust, but verify Notwithstanding our extensive and rigorous examination, the evidence clearly suggests that Gary simple, intuitive, and comprehensive model is worth the effort it takes to understand it.

One of my best friends, who happens to be a former market maker for the largest emerging de players in the world and who, not coincidently, has already retired to Miami at the ripe old age of 4 often tells me, “Rising prices attract buyers; falling prices attract sellers.” In as many words, m friend is describing the momentum effect. Gary takes the momentum phenomenon—that every trad intuitively understands and uses—to a higher level, and one that is accessible to investors of a stripes.

Why did it take so long for a book like *Dual Momentum Investing* to hit the market? The answer straightforward: it took a unique author, and there is only one Gary. He is a singular figure in th world of momentum. My relationship with Gary was born via the same mechanism through which meet many fascinating folks: a blog romance. I was thinking about a momentum-related content pie for TurnkeyAnalyst.com, a blog dedicated to democratizing quantitative investing, and Gary’s pap “Absolute Momentum: A Simple Rule-Based Strategy and Universal Trend-Following Overlay” cam across my desk. I immediately thought, “This won’t do. Here we go again—another practition posing as a serious academic researcher.” But then I read Gary’s paper. The further I read, the mor impressed I became. The paper was well written, clear, scientific in its construction, and read like a academic journal article. I couldn’t understand why the author wasn’t employed at a university. I ha to learn more.

After multiple conversations via e-mail and phone, I decided I had to meet Gary in perso Consistent with how these blog romances evolve, we scheduled a “geek date” at the 2013 Wester Finance Association Annual Meeting in Lake Tahoe. As I waited in the lobby of the Hyatt Regenc watching herds of famous (and infamous) academics scurry along to the various sessions, a cur haired, low-profile man confidently strolled through the fancy double doors in a pair of jeans and short-sleeved collared sheet. This was no tweed-clad academic with Coke bottle glasses. I pointed his ~~direction and asked, “Gary, is that you?” Gary responded with a wide smile, “Wes? Hey man~~, let hurry up and catch the session on inferring arbitrage capital from return correlations!” And so it wa that our curious blog relationship began to blossom into a full romance.

We were running late, so we ran out the door toward the lake where the finance sessions wer under way. We arrived, sweaty and winded—probably not in a condition to open the door on a ongoing paper presentation and get the death stare from 50+ finance professors. I suggested, “Gar let’s just chill out, grab some coffee, and we can hit the next paper presentations.” Little did I know was about to get a presentation far superior to anything that was going on behind the many close doors.

Gary and I strolled outside with our coffee, and he started shedding some light on his backgroun “So there I was, in the Army and on my way to combat as a medic …” I interrupted, “Wait, you are Vietnam vet? I was a captain in the United States Marine Corps and an Iraq vet!” We both looked a each other, amused at this unanticipated congruity. I knew that a military background often drive certain character traits that are useful in the investing world. Next, Gary continued describing h unique background, “Yeah, I’ve done some cool things. I lived in India for a few years, went on tou as a comedy magician for a while, was an award-winning artist, and I have an MBA from the Harvar Business School.” Perplexed, I had to stop him, “Say again?”

After about an hour went by and my head stopped spinning from listening to the various exploi Gary had engaged in over the years, I had to ask him the question: “Gary, sounds like you’re a guy th never wanted to get a real job—why didn’t you become an academic? You’d be perfect!” And o course, as I should have anticipated, he replied, “Wes, funny you ask. I almost followed your sam path when I was your age. I applied to the Chicago Finance PhD program and was accepted. I reall wanted to be an academic researcher.” It all began to make sense. I questioned, “Well, wha happened?” Gary, always ready with the right answer, replied, “Well, I almost pursued tha opportunity, but I was making a ton of money trading options. Plus, I didn’t believe in the efficie market hypothesis, and I worried that if I entered the program I would have to give up making mone because they were saying the markets couldn’t be beat!” I pondered Gary’s response and thought th had I been faced with the same opportunity, I would probably have done the same thing.

So what is the moral of the story here, and why have I spent so much time describing m relationship and experience with Gary? My hope is that you can identify, as I did, that Gary is unique person with unique talents. Gary has a way of compiling massive amounts of research fro diverse areas and synthesizing it in such a way that even a struggling momentum half-wit like me ca actually comprehend what is going on. And make no mistake. What Gary has done is extreme challenging. It requires broad-ranging knowledge and an ability to connect the dots across man domains. I know, because I have tried. My own research on value investing and behavioral finance le to my coauthored book on value investing, *Quantitative Value*. My takeaways were similar to Gary’ My book serves as a reminder that (1) I will never be Buffett, and (2) combining a systematic decisio process with a sound investment philosophy has historically been a successful way to compour wealth over time. Gary’s book also provided some reminders: (1) I will never be able to write a clearly as Gary, and (2) momentum investing is a top-shelf anomaly, similar to, if not better than, th value anomaly. I was feeling a bit jealous.

I’m excited to find out what people think of Gary’s great book about momentum investing. Unlik the value-investing space, where investment offices are plastered with “classics,” there really isn’t classic text on momentum investing. In Gary’s work, we may have an instant classic. I think Gary *Dual Momentum Investing* should be the first book on everyone’s momentum shelf. I hope everyon enjoys the read as much as I did, and most importantly, I hope you learn something that makes you better investor in the future.

Wesley R. Gray, Ph
Executive Managing Member, Empiritra
Coauthor of *Quantitative Val*

ACKNOWLEDGMENTS

If I have seen further, it is by standing on the shoulders of giants.

—Isaac Newto

I NEVER COULD HAVE WRITTEN THIS book had it not been for the substantial body of work by so man dedicated momentum researchers over the past 80 years. I am particularly indebted to Alfre Cowles III and Herbert E. Jones, who painstakingly hand-calculated and published the very fir quantitative study of momentum in 1937. Practitioners today, me included, still incorpora momentum in much the same way that Cowles and Jones presented it.

I wish to thank Wes Gray for his encouragement in getting me to put words to paper. Wes and hi associate, David Foulke, also gave me valuable feedback on this book's content.

I am indebted to Tony Cooper for his insightful comments and worthwhile contributions to th book. I also appreciate the useful suggestions that Cheryl Becwar, Riccardo Ronco, Charles W ("Bill") White, and John Hardin gave me. Finally, I am grateful to my excellent editorial team o Jonathan Lobatto, Dr. Stephen Miller, Larry Pell, and Kyra Kitts for their kind and helpful assistance

PREFACE

> Profit in the share market is goblin treasure; at one moment, it is carbuncles, the next it is coal; one moment diamonds, and the next pebbles. Sometimes they are the tears that Aurora leaves on the sweet morning's grass; at other times, they are just tears.
>
> —*José de la Vega*, Confusion of Confusions, 168

ACCORDING TO THE RESPECTED MIT financial economist Andrew Lo (2012), "Buy and hold doesn work anymore. The volatility is too significant. Almost any asset can suddenly become muc more risky."[1] Even Warren Buffett's Berkshire Hathaway, Inc. lost nearly 50% of its market value o two separate occasions since 1998.

Mohamed El-Erian, former head of PIMCO, said, "Diversification alone is no longer sufficient temper risk. You need something more to manage risk well." Diversification has long been called th only free lunch in investing. Now somebody needs to pay for that lunch. Because financial marke have become progressively more integrated and correlated, multiasset diversification can no long protect investors from severe market losses. Such losses can cause investors to overreact and conve temporary setbacks into permanent ones by closing out their investments prematurely.

What we need now is a new paradigm that dynamically adjusts to market risk and keeps us sa from the vagaries of today's highly volatile markets. We need a way to earn long-term above-marke returns while limiting our downside exposure. This book shows how momentum investing can mal that desirable outcome a reality.

Momentum, or persistence in performance, has been one of the most heavily researched finan topics over the past 20 years. Academic research has shown momentum to be a valid strategy from th early 1800s up to the present, and across nearly all asset classes. After many years of such inten scrutiny, the academic community now accepts momentum as the "premier anomaly" for achievi consistently high risk-adjusted returns.[2]

Yet momentum is still largely undiscovered by most mainstream investors. I wrote this book help bridge the gap between the academic research on momentum, which is extensive, and its rea world application, which is still minimal.

The first goal of this book is to explain momentum principles so readers can easily understand a readily appreciate them. I present the history of momentum investing and bring readers up to speed modern financial theory and the possible reasons why momentum works. I then look at a wide ran of asset choices and alternative investment approaches. I finally show how dual momentum— combination of relative strength and trend-following methods that I introduced in two award-winni research papers—is the ideal way to invest.

I develop and present an easy-to-understand, straightforward application of dual momentum tha call Global Equities Momentum (GEM). Using only a U.S. stock market index, an all world non-U. stock market index, and an aggregate bond index, I show how investors using GEM could ha

achieved long-run returns nearly twice as high as the world stock market over the past 40 years whi
avoiding severe bear market losses.

I am always amazed when I think of how much time and effort most people put into accumulati wealth and how little study and effort they put into finding the best ways of preserving and growi that wealth. Warren Buffett says that risk comes from not knowing what you are doing. This boo should help remedy that situation and steer you in the right direction.

Dual Momentum Investing is more than just an introduction to momentum investing ideas. It also a practical guide to help investors and investment professionals tune in with market forces a profit from this newfound knowledge.

I have tried to make the book interesting and useful to as many readers as possible. I include son advanced material for those interested in an in-depth treatment of the subject, while also keeping t book understandable to more casual readers. I provide a glossary for those who may need help wi the vocabulary of modern finance. So, let us get started.

WORLD'S FIRST INDEX FUND

Never trust the experts.

—John F. Kenne

INDEX FUNDS ARE WELL KNOWN today. Many think John McQuown and Bill Fouse at Wells Farg (which became Barclays Global Investors) started the first index fund in 1971 when they invested every New York Stock Exchange (NYSE) stock for the Samsonite pension fund. However, that is no correct. Let me tell you how it really happened.[1]

I discovered the real first index fund during a chance meeting I had while working at Smith Barne & Co. in 1976. At that time Smith Barney was a prestigious investment banking and institution brokerage firm similar to Goldman Sachs, Salomon Brothers, and First Boston. Along with the rest the Street at that time, Smith Barney wanted more of a retail distribution network, so they had recent acquired Harris Upham, a retail-oriented wirehouse. As is usual after these kinds of acquisition Smith Barney let go the redundant operations of Harris Upham. However, Harris Upham had one the best over-the-counter (OTC) departments in the business, headed up by Bob Topol, who was charge of all their OTC activity.

In those days, there was no electronic marketplace. In order to buy or sell OTC securities, one ha to phone around to different brokerage firms and check the bid/offer spreads maintained by each their market makers. A top-notch OTC market maker could become a terrific profit center for a firm This was not only because the bid/offer spreads of OTC securities were sometimes large enough drive a small vehicle through them. The best OTC market makers also profited from their acumen maintaining large inventories of OTC stocks. They could slant their bids and offers to end up wi larger positions in stocks they really liked, and smaller or short positions in those they disliked. Bo was one of the very best stock pickers in the business. Top institutional investors would deal with hi in order to find out his view of the stocks they were interested in, as well as to be able to execute the trades in the large, liquid inventories that Bob routinely maintained.

Smith Barney was proud to have Bob onboard. They sent him around to all their offices representatives could learn more about Bob and feel comfortable directing business his way. Soo after the merger, Bob came around to our office to introduce himself and explain what he could do f us. It was not Bob and what Bob did that opened my eyes, but rather it was the story that he told us.

Bob arrived about an hour before lunch and gave an impressive presentation explaining some the finer points of OTC market making. It was obvious to everyone there why Bob was so admired a respected. One of my colleagues complimented Bob on his superior trading ability and his profi generating capability. Bob thanked him, sat back in his chair, paused a moment, then casual remarked, “Yes, I’ve done well, but would you like to hear about someone who has done better tha me? ~~In fact, this person has done better in the market than anyone else I know.”~~

We all quickly sat back down. Bob had our complete attention. As we stared at him inquiringly Bob continued, “The best investor I know—one who has outperformed all the professional mone managers I’m familiar with—is my wife, Dee. Would you like to hear how she does it?”

Sasquatch could have walked into the room, and no one would have noticed. Here was Bob, one the industry’s top traders and market makers, who did business with some of the world’s best mone managers, telling us that his wife did better at investing than all of them! Now he was about to tell u how she did it. As they say, you could have heard a pin drop.

Ignoring our stunned silence, Bob continued, “Dee has always been very patriotic. So years ag she decided to buy all the stocks with ‘U.S.’ or ‘American’ in their names. She bought U.S. Steel, U.S Shoe, U.S. Gypsum, U.S. Silica, American Airlines, American Brands, American Can, America Cyanamid, American Electric Power, American Express, American Greetings, American Hom Products, American Hospital Supply, American International Group, American Locomotive (this wa a while ago), American Motors, American South African, American Telephone & Telegraph, Britis American Tobacco, North American Aviation, Pan American Airlines … and many smalle companies.”

Some of us started smiling. We did not know if Bob was serious or if he was putting us o However, Bob seemed sincere and continued, “Dee did very well this way. After a number of year she wanted to buy some additional stocks. Since she admired General Eisenhower and Gener MacArthur, she decided to buy all the Generals: General Dynamics, General Electric, General Mill General Motors, General Maritime, General Steel, General Telephone, Dollar General, Mercur General, Media General, Portland General Electric … . Since then, Dee has continued to do better wi her portfolio than anyone I know, and that’s the God’s honest truth.”

Everyone smiled at Bob and seemed amused as we adjourned for lunch. However, for days, an then weeks, I could not stop thinking about Dee. Dee had access to some astute investme information herself. Not only had she then been married to Bob for almost 30 years then, but Dee father had owned an OTC market-making firm. I kept asking myself how Dee could hav outperformed the world’s best money managers for so long with such a naïve strategy. Had she ju been incredibly lucky? After a few weeks, the answers came to me.

WHY IT WORKED

First, Dee’s portfolio had relatively little in the way of transaction costs. She bought stocks only onc and held onto them forever. Commissions were a lot higher back then, and this was a significant co saving. In addition, Dee’s permanent portfolio was not subject to ill-timed buy and sell decision based on emotional responses to market performance. We will see later that this is often a significan drag on investor returns.

Lack of portfolio turnover and emotionally based decision making were not the whole stor however. Dee also did not have to pay management fees to anyone. That saved her at least 1% p year, compared to what investors paid who were in mutual funds or other managed investme programs.

Finally, Dee’s portfolio was well diversified. This was not true of most investor portfolios at th time. They usually had a bias toward a particular investment style, such as defensive, growth, larg cap, and so on. Back then, large-cap "glamour" stocks, such as Avon, Coke, Disney, IBM, Koda Mc~~Donald's, Merck, Polaroid, and Xerox, were very popular. These "Nifty-Fifty" sometimes~~ sold enormous price/earnings (P/E) ratios. For example, in the 1970s, McDonalds' P/E was 68, Johnson Johnson's was 62, and Coca-Cola's was 48. Extreme P/E ratios like these could be justified only those companies had growth rates such that the value of, say, Avon stock would now exceed the gros domestic product (GDP) of some countries. The noted economist Kenneth Boulding once sai "Anyone who thinks steady growth can continue indefinitely is either a madman or an economist."[2]

Dee's randomly constructed portfolio did not have a particular bias or investment style. It was lil the market itself—equally balanced among small cap, large cap, value, growth, and just about eve other factor. In fact, Dee's portfolio was a more balanced portfolio than the Standard & Poor's 50 Index, with its large cap and growth stock tilt. Dee had unwittingly created the world's first inde fund, and a good one at that. She did so without the need for brokers, money managers, or anythi else, except a dictionary.

LESSONS LEARNED

The reasons for Dee's success were a life-changing revelation for me. Here are the lessons I took awa from my understanding of why Dee was successful:

- It is important to keep costs as low as possible. This is the easiest way to earn risk-adjusted excess return (alpha).
- One should diversify broadly, and not just by picking stocks with different names having similar characteristics. One should diversify with respect to company size, investment style, industry concentration, and other biases.
- It is not easy to beat the market. Very few investors do. Replicating the market portfolio may be a good thing.

Based on these realizations, I decided to quit the brokerage business. It no longer made sense f me to be a stock jockey saddling investors with high costs and overconcentrated portfolios trying beat similar accounts handled by other stock jockeys to an ever-elusive finish line.

I saw there were now two options left for me with respect to professional investment managemen The first was to become an efficient marketeer, which sounded similar to being a Mickey Mousekete and, to me, was no less silly. I viewed efficient markets like I viewed Ptolemaic astronomy, with bo based largely on a priori assumptions. My second option, according to those in academic finance that time, was to become like Don Quixote, tilting at the windmills of efficient market theory.

EFFICIENT MARKETS

By the mid-1970s, the efficient market hypothesis (EMH) had made a strong impression on the min of otherwise sensible people. EMH is the belief that prices of stocks fully reflect all publicly availab information about them. This means that no one can expect to beat the market consistently.

I had toyed briefly with the EMH idea. I applied and was accepted into the finance PhD program the ~~University of Chicago, which was the bastion of EMH. However, I never attended~~ due frightening thoughts I had of being tarred and feathered as a heretic on the University of Chica quadrangle.

The idea behind efficient markets actually got its start in the 1800s when Charles Dow (founder Dow Jones & Co. and the *Wall Street Journal*) commented on the market as an efficient processor information: “In fact, the market reduces to a bloodless verdict all knowledge bearing on finance, bo domestic and foreign. The price movements, therefore, represent everything everybody knows, hope believes, and anticipates.” In his 1889 book called *The Stock Markets of London, Paris, and New Yor* George Gibson wrote, “Shares become publicly known in an open market. The value which th acquire may be regarded as the judgment of the best intelligence concerning them.” Followers EMH later claimed as their own the concept that prices reflect all available public information.

A more substantive rationale for EMH appeared in the PhD thesis of Louis Bachelier in 190 Bachelier compared the behavior of stock market buyers and sellers to the random movement particles suspended in fluid. Bachelier concluded that stock price movements are random, and it impossible to make predictions about them. Prior to this, in 1863, Jules Regnault used a randomne model to say that the deviation of stock prices is directly proportional to the square root of tim Bachelier, however, was the first to accurately model stochastic processes. These were calle Brownian motion, after the Scottish botanist Robert Brown, who in 1826 first noted the rando movements of pollen grains suspended in water. Einstein got the credit for explaining Browni motion mathematically in 1905, but Bachelier had already done so in his PhD dissertation written fi years earlier. Bachelier was also way ahead of his time with respect to his pioneering work probability theory.[3]

Bachelier turned his PhD thesis into a book published in 1900 called *The Theory of Speculation*. did not attract much attention until the statistician Leonard “Jimmy” Savage rediscovered it whi doing research on the history of probability. Savage was so impressed with Bachelier’s pioneeri work with respect to speculative markets that he sent postcards about it to a dozen or so economists knew in the mid-1950s.

Paul Samuelson had been working on similar ideas himself. He was delighted to hear from Sava and find out about Bachelier. It allowed Samuelson to put all the pieces together into a unifi equilibrium framework based on Bachelier’s work. In 1965, Samuelson published a seminal pap using Bachelier’s ideas about efficient markets and Samuelson’s own proof to support it.

Samuelson went on to write the bestselling economics textbook of all time in which he strong endorsed EMH. Samuelson was the first American to receive the Nobel Prize in Economic Science This was in 1970, the second year of the award.

Although I had looked into EMH, I had also read most of the practical books I could find investing, such as those by Graham and Dodd (1951), Darvas (1960), Thorp and Kassouf (1967), a Levy (1968). (I will describe the work of Darvas and Levy, who used relative strength momentu based investing, in more detail in the next chapter.)

I was also familiar with some well-respected mutual fund managers, such as John Neff, Willia Ruane, Walter Schloss, and Max Heine, and I had an exceptional hedge fund manager as a client. A had consistently outperformed Mr. Market. I could not believe that outperformance by such astu investors was due only to chance or luck. The outcomes of these investors seemed clearly at odds wi what academics were saying. While academics were extolling the virtues of EMH, practitioners li these were doing something completely different, and they were succeeding.

Andrew Lo, one of the first economists to look thoroughly at market pricing anomalies, tells ho ~~years ago he did some rigorous research on technical analysis. He identified predictable patterns~~ stock prices, which, to academics back then, was akin to voodoo. Lo presented his encouraging resul to an MIT colleague who responded, "Your data must be wrong."[4]

According to the "joint hypothesis," one can only say if a market is or is not efficient wi reference to a model of equilibrium returns. If such a model can predict the market, then either t model is wrong or markets are not efficient. Lo must have done some very good research for h colleague to think up a third alternative, that of erroneous data. In the words of Nietzsch "convictions are more dangerous enemies of truth than lies." EMH had become a belief system wi many firm adherents, not unlike religion. George Soros (2003), the world's most successful hed fund manager, who has earned $39.6 billion in net gains, called EMH "market fundamentalism Hallelujah! Throughout the 1970s and 1980s EMH ruled supreme.

Warren Buffett wrote in his 1988 Berkshire Hathaway chairman's letter, "Amazingly, EMH wa embraced not only by academics, but also by many investment professionals and corporate manage as well. Observing correctly that the market was *frequently* efficient, they went on to conclude that was *always* efficient. The difference between these propositions is night and day."[5]

Other indications also pointed away from perfectly efficient markets and investor rationalit These included premiums on closed-end fund and government-backed mortgage securities that are n arbitraged away, and ubiquitous market bubbles that imply substantial deviations of prices fro intrinsic values over extended periods.

ALTERNATIVES TO PASSIVE INVESTING

Even though I knew that the market was very hard to beat, I came to believe that it was not impossib to do so. For better or worse, I took upon myself the formidable task of trying to identify and explo true market anomalies and inefficiencies. Don Quixote, move over.

In the late 1970s, I had the idea, long before Long-Term Capital Management (LTCM), managing a derivatives-based hedge fund. There were no publicly available data feeds back then, s hired an electrical engineer to tear apart a quote machine, dump the data into a microprocessor, a then feed that into our office minicomputer. I formed partnerships with market makers on all t option exchange floors, did well initially, and then suffered the same fate as later befell LTCM. Th was due to the same reasons of overleverage coupled with highly unusual events. I, however, did n reach the "limits of arbitrage" and require the intervention of the Federal Reserve to keep fro destroying the world's financial system.[6] I tried to learn from that experience and move on, st convinced that there were anomalies out there ready to be exploited.

In the early 1980s, I had another promising idea and started commodities pools that used my ov Bayesian-based portfolio optimization model to allocate capital to some of the world's top trade such as Paul Tudor Jones, Louis Bacon, Richard Dennis, John W. Henry, Al Weiss, Tom Baldwin, an Jim Simons. These traders not only were very successful; their results were also largely uncorrelat to one another due to their different trading approaches and diverse portfolios. Portfolio optimizati fit this situation to a tee, and my investment partnerships prospered.

As I watched Paul Tudor Jones trade for us, I came to know beyond any doubt that I had bee correct in rejecting EMH. I felt fully vindicated in venturing outside the realm of efficient mark theory. I did not know, however, if I would ever again find another opportunity that was th rewarding.

However, I was motivated to keep looking. Commodity trading has capacity constraints. Some o the best traders end up returning investor funds and trading mostly their own accounts, which is wh happened with several of my traders. In addition, the generous commodities risk premium th speculators enjoyed from the 1970s to the 1990s had largely dissipated by the 2000s. Speculat participation had risen sharply, and there were many more speculators around to share in the limite amount of risk premium provided by hedgers. It was time to move on. Little did I know at the tin that it would take nearly 20 years before I would find another opportunity to exploit market tren using what is essentially the same principle—systematic price momentum.

THE TIDE STARTS TO TURN

By the 1990s, behavioral finance had become popular. With it came challenges to ration expectations and the EMH. The Nobel laureate Robert Shiller (1992) wrote, “This argument for t efficient market hypothesis represents one of the most remarkable errors in the history of econom thought. It is remarkable in the immediacy of its logical error and in the sweep and implications for i conclusions.”

Before then, prominent economists sometimes had to hide in the active management close Charlie Munger, Warren Buffett’s right-hand man, wrote, “One of the greatest economists of th world is a substantial shareholder in Berkshire Hathaway and has been for a long time. His textboo taught that the stock market was perfectly efficient, and that nobody could beat it. But his own mone went into Berkshire Hathaway and made him wealthy.”[7]

According to *Fortune* magazine, that economist was the same Paul Samuelson whose bestsellin textbook championed the cause of efficient markets and who had published an academic proof support of EMH![8]

Samuelson’s 1974 paper, “Challenge to Judgment,” is what inspired John Bogle of Vanguard t start the first public index fund in 1976. Afterward, Samuelson wrote the following about what som referred to as Bogle’s folly, “I rank this Bogle’s invention along with the invention of the wheel, th alphabet, Gutenberg printing, and wine and cheese; a mutual fund that never made Bogle rich b elevated the long-term returns of the mutual-fund owners. Something new under the sun.”[9]

So here we have Samuelson inspiring the first public index fund and then praising it to the hig heavens, while Warren Buffett actively manages Samuelson’s own money. Maybe the wheel, th alphabet, and Gutenberg printing were not that great after all.

THE MOMENTUM ANOMALY

As more people began questioning EMH orthodoxy, an intriguing area started appearing in th academic literature. The burgeoning field of behavioral finance led some to question wheth investors always acted rationally and in their own best interests. People acting in emotional an irrational ways could cause prices to depart systematically from their fundamental values predictable ways. Maybe the markets could be beat after all, since irrational investors might allo anomalies to persist. In light of this possibility, momentum started to receive attention from th academic community beginning in the early 1990s. Behavioral factors could be used to explain man of the characteristics of momentum.

After years of momentum research by many academics, even Eugene Fama and Kenneth Frenc two of the founders of EMH, began paying attention to momentum, which they called the "premi anomaly."[10] Momentum was powerful, persistent, and not explainable by any of the commonly know risk factors.

Not only did momentum research benefit from EMH losing its hold over modern finance, but th findings of momentum researchers added considerably to the body of knowledge that itse contradicted the efficient markets hypothesis.

The following chapters will show how I combined the best elements of academic momentu research, added a few ideas of my own, and came up with a simple and practical method f generating exceptional profits with less risk by using momentum. Furthermore, I will show how yo can apply this methodology to the largest liquid markets having high expected long-run returns.

Before doing this, I will introduce you to the history of momentum theory so you can understar and appreciate momentum's historical effectiveness and longevity. I will also show how momentur fits into the strange and mysterious world of modern finance. Then we will look at the logic underpinnings behind momentum to help you better understand how and why it works. Next, we wi look at asset choices and alternative investment opportunities. I will then be ready to present a simp and effective momentum-based model that you can use.

After presenting my model, I will explore other momentum approaches and additional applicatior using dual momentum. By the end of the book, you should have a good understanding of momentur as well as everything you need to know in order reap its rewards.

WHAT GOES UP . . . STAYS UP

It may be that the race is not always to the swift, nor the battle to the strong, but that's the way to bet.

—*Damon Runyo*

SO WHAT IS MOMENTUM? IT is the tendency of investments to persist in their performance. Investmen that have done well will continue to do well, while those that have done poorly will continue to d poorly.

CLASSICAL IDEAS

Momentum investing has a long and distinguished history. I will take you through its evolution. Th idea of momentum began with Newton's first law of motion: every object in a state of uniform motio tends to remain in that state of motion. It is unlikely Sir Isaac had investing in mind when he came u with this law. If he did, then he should have paid more attention to apples falling from trees an reminded himself that what goes up, must come back down. Newton lost a fortune in the South Se stock bubble of 1718–1721 by buying too late and holding on too long. Newton afterward said, "I ca calculate the movement of stars, but not the madness of men." Alas, poor Newton was not alone that regard.

The first notable person to express momentum principles in investment terms was the gre classical economist, David Ricardo. Ricardo wisely considered downside as well as upside momentu when he said in 1838, "Cut your losses; let your profits run on." Ricardo followed his own advice an retired at the age of 42, having amassed a fortune of $65 million in today's dollars.

MOMENTUM IN THE EARLY TWENTIETH CENTURY

Momentum principles in the form of a disciplined investing style were alive and well early in th twentieth century. Momentum dominates much of the famous book *Reminiscences of a Sto Operator* by journalist Edwin Lefèvre (2010), originally written in 1923. It describes the thoughts an exploits of legendary trader Jesse Livermore. Livermore once said, "Big money is not in th individual fluctuations, but in sizing up the entire market and its trend." Trend following is a form o momentum investing. Livermore introduced the momentum idea of buying stocks when they a making new highs. His statement “Prices are never too high to begin buying or too low to beg selling” accurately describes momentum style investing.

Richard Wyckoff also wrote books beginning in the 1920s that drew heavily on momentu principles. In his 1924 book, *How I Trade in Stocks and Bonds: Being Some Methods Evolved ar Adapted During My Thirty-Three Years Experience in Wall Street* , Wyckoff advocated buying th strongest stocks within the strongest sectors and within the strongest index when they were trendi up during the marking up phase of their accumulation-distribution cycle. Wyckoff used his ideas amass a fortune in the stock market before he retired to a 9.5-acre estate and mansion in th Hamptons, next to Alfred P. Sloan, the legendary chairman of General Motors.

In his bestseller, *The Seven Pillars of Stock Market Success*, George Seamans (193 recommended that traders buy stronger stocks during an advance and short weaker stocks durin declines, which is very much in tune with relative strength momentum investing.

On the quantitative side of things, beginning in the late 1920s, Arnold Bernhard, founder of th Value Line Investment Survey, successfully used relative strength price momentum in conjunctio with earnings growth momentum. According to the Value Line website, Group 1 stocks are thos ranked highest in performance over the past year and that had accelerating earnings growth. Fro 1965 through 2012, Group 1 stocks had an average annual gain of 12.9% before dividends, while th S&P 500 gained 6.1%. Group 5 stocks had a –9.8% annual loss. Dividing a stock’s latest 10-wee average relative performance by its 52-week average relative price is the price momentum factor sti used today by Value Line.

H. M. Gartley developed momentum-based relative velocity ratings in the 1920s. The Dow theori Robert Rhea (1932) subsequently published these ratings in his book *The Dow Theory*. Gartley (194 himself wrote an article titled “Relative Velocity Statistics: Their Application in Portfolio Analysis for the *Financial Analysts Journal*. In that article Gartley wrote, “In addition to the usual valuatio methods applied to stock, analysts should consider its velocity. The velocity statistic is a technic factor in the stock’s price volatility that measures the percentage rise and fall of a stock against a average.” This was yet another way to express relative strength price momentum.

In his 1935 book *Profits in the Stock Market*, Gartley introduced the world to trend-followi moving averages. Bernhardt and Gartley were both early pioneers of quantitative, rules-base momentum strategies.

The first truly scientific study and published academic paper on momentum was by Alfred Cowle III and Herbert E. Jones (1937). Cowles was a prominent economist who founded the Cowl Foundation for Economic Research, initially at the University of Chicago and now at Yale. There wer no computers back then, so Cowles and Jones painstakingly hand-compiled stock performan statistics from 1920 through 1935. This was a remarkable accomplishment at that time. Cowles an Jones found that the strongest stocks during the preceding year had a very strong tendency to rema strong during the following year. In their own words, “Taking one year as the unit of measurement fo the period 1920 to 1935, the tendency is very pronounced for stocks which have exceeded the medi in one year to exceed it also in the year following.” The same basis underlies today’s relative streng momentum approach to investing, and the conclusions of Cowles and Jones are just as valid today when they were first revealed in 1937.

MOMENTUM IN THE MID-TWENTIETH CENTURY

In the 1950s, George Chestnutt published a newsletter that ranked relative strength momentum of bo stocks and industries. Here is some advice Chestnutt gave his newsletter readers:

> Which is the best policy? To buy a strong stock that is leading the advance, or to shop around for a sleeper or behind-the-market stock in the hope that it will catch up? On the basis of statistics covering thousands of individual examples, the answer is very clear as to where the best probabilities lie. Many more times than not, it is better to buy the leaders and leave the laggards alone. In the market, as in many other phases of life, the strong get stronger, and the weak get weaker.

Chestnutt (1961) also wrote a book on relative strength investing and used this approach manage successfully the American Investors Fund. From January 1958 through March 1964, this fur had a cumulative return of 160.5%, versus 82.6% for the Dow Jones Industrial Average.

Chestnutt never became well known, but another momentum investor and mutual fund manager the time did. He was Jack Dreyfus, also known as the Lion of Wall Street.

Dreyfus began his career using a $20,000 loan, and he retired a billionaire. Here is how l described his investment philosophy: “If you’ve got an escalator that’s going up, you’re better o betting on an individual on that escalator than on an individual on an escalator that’s going down Dreyfus bought stocks only when they broke to new highs off sound chart patterns. His Dreyfus Fur was up 604% from 1953 to 1964, compared to 346% for the Dow Jones Industrial Average.

Two small funds at Fidelity started to emulate Dreyfus’s investment technique. They wer managed by Edward “Ned” Johnson II, the founder of Fidelity Management & Research in 1946, ar Gerald Tsai, manager of the Fidelity Capital Fund. Tsai, a colorful figure, championed momentum ar increased the popularity of momentum investing to the point that he became the first mutual fur manager to gain celebrity treatment in the press. He founded the Manhattan Fund in 1965, expectir to raise $25 million in the fund’s first year. Instead, Tsai attracted $275 million during the fund’s firs day.

Dreyfus also influenced William O’Neil, publisher of *Investor’s Business Daily*. O’Neil’s mot was “buy the strong, sell the weak.” One of the key features of O’Neil’s well-known CAN SLII method was to buy stocks that outperformed other stocks and sell those that underperformed. Th idea is right out the momentum playbook. O’Neil said, “What seems too high in price and risky to th majority goes higher eventually, and what seems low and cheap usually goes lower.”[1] O’Neil’s boo *How to Make Money in Stocks*, featuring his CAN SLIM approach, has sold over two million copi since 1988.

Also in the 1960s, Nicolas Darvas (1960) wrote several inspiring and entertaining books, includir the popular *How I Made $2,000,000 in the Stock Market*. The book describes his adventures as professional dancer traveling the world while sending off buy and sell cables to his broker. Darva would buy strong stocks making new highs, hold them until their momentum began to wane, and the replace them with new price leaders.

Gilbert Haller (1965) advocated a similar “strongest stocks” strategy in his book, *The Hall Theory of Stock Market Trends*. George Soros (2003) used a variation of momentum that he calle positive feedback “reflexivity” in order to accumulate large profits with conglomerates and real esta investment trusts (REITs) in the 1960s and 1970s. According to Soros, buying begets further buying i a self-reinforcing process. We will see in Chapter 4 that positive feedback trading due to behavior factors is one of the key characteristics of momentum.

Momentum has always been the engine behind speculative commodity trading. Richard Donchia launched the first managed futures fund in 1949. Donchian thought price movements in stocks ar commodities were often too optimistic or pessimistic because they reflected the emotions of th people trading them. He believed that trend followers could profit from this overextension of prices.

In 1960, Donchian began a weekly commodities newsletter that featured his 5- and 20-day movin average trend-following system. His well-known 4-week channel breakout method inspired other gre traders like Ed Seykota and Richard Dennis. Dennis taught his Turtle Traders a version of Donchian channel breakout system, and a number of them went on to become very successful commodi trading advisors.[2] Seykota also trained a number of highly successful traders, such as Michael Marc and David Druz, and developed the first large-scale commercial computerized trading system. Ja Schwager said about Seykota in his first *Market Wizards* book, "the accounts Seykota managed hav witnessed an absolutely astounding rate of return … . I know of no other trader who has his trac record over the same length of time."[3] Seykota later launched "Ed's Six Step Program" to help oth trend traders.[4]

During the 1970s and 1980s, the torch of momentum investing passed to successful hedge fu managers who were often reticent to talk about their activities. One prominent momentum invest however, was the outspoken philanthropist and mutual fund manager, Richard Driehaus.

Driehaus began his investment career in 1968. He manages over $10 billion following momentum strategy similar to the ones used by Darvas, Chestnutt, and Haller—rotational, relati strength investing using top-performing stocks. In 1970, *Barron's* named Driehaus to its "A Century" team of 25 persons who have been the most influential within the mutual fund industry ov the past 100 years. Jack Schwager (2008) featured Driehaus in his book *The New Market Wizards*, did Peter Tanous (1999) in his book *Investment Gurus*. Here are a few quotes from Drieha describing his momentum-based approach:

> Perhaps the best-known investment paradigm is buy low, sell high. I believe that more money can be made by buying high and selling at even higher prices … . I try to buy stocks that have already had good price moves, that are already making new highs, and that have positive relative strength … . I always look for the best potential performance at the current time. Even if I think that a stock I hold will go higher, if I believe another stock will do significantly better in the interim, I will switch.

Even before serious academic research on momentum began in earnest in the 1990s, it was hard dismiss the practical value and impressive results of relative strength momentum investing.

MODERN MOMENTUM

The first computer-based study of momentum was by Robert A. Levy (1967). Levy coined the phra "relative strength," which is a good way to characterize this style of investing. Academics lat renamed this systematic, quantitative approach "momentum," which is a more generic term also us by practitioners to mean buying strong stocks. Discretionary dot-com traders ("gunslingers" w thought a horse is easiest to ride in the direction it is already going) during the 1990s were often call momentum players. This confusion between systematic, rules-based momentum and seat-of-the-pa discretionary momentum persists even today. Levy's term "relative strength" is a much more accura description of quantitative, rules-based momentum, but Levy presented his findings bef momentum became respectable to the academic community. When academics caught on momentum, they probably did not want to have their work associated with Levy. They preferr instead to engage in identity theft by changing the name from *relative strength* to *momentum*. Th were either unaware that this term *momentum* was already being used by practitioners to me sample content of Dual Momentum Investing: An Innovative Strategy for Higher Returns with Lower Risk

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