Foreword by BARRY RITHOLTZ

THE BESTSELLING CLASSIC

# TREND FOLLOWING

REVISED & EXTENDED FIFTH EDITION

How to Make a Fortune in **Bull**, **Bear**, and **Black Swan Markets**

MICHAEL W. COVEL

WILEY

# Thinking Outside the Box

# 5

*How to hit home runs: I swing as hard as I can, and I try to swing right through the ball . . . The harder you grip the bat, the more you can swing it through the ball, and the farther the ball will go. I swing big, with everything I've got. I hit big or I miss big. I like to live as big as I can.*
**—Babe Ruth**

*What is striking is that the leading thinkers across varied fields—including horse betting, casino gambling, and investing—all emphasize the same point. We call it the Babe Ruth effect: even though Ruth struck out a lot, he was one of baseball's greatest hitters.*
**—Michael J. Mauboussin**[1]

*Lenny [Dykstra] didn't let his mind mess him up. . . . Only a psychological freak could approach a 100-mph fastball aimed not all that far from his head with total confidence. "Lenny was so perfectly designed, emotionally, to play the game of baseball. . . . He was able to instantly forget any failure and draw strength from every success. He had no concept of failure."*
***Moneyball***[2]

Since the first edition of *Trend Following*, sports analytics has exploded. In the last decade professional sports have undergone a remodeling, with teams scrambling to change strategies to accommodate untold new trends in statistical analysis. There haven't necessarily been major rule changes, nor have there been any substantial changes to the venues or the equipment. Instead, the renaissance is rooted in an unconventional process known as *sabermetrics*.[3]

Today, every major professional sports team either has an analytics department or an analytics expert on staff. The popularity of data driven decision making in sports has trickled down to the fans too,

as they are consuming more analytical content than ever. There are now entire websites dedicated to the research and analysis of sports statistics, i.e., FiveThirtyEight.com.* The use of analytics has enabled organizations and players to build a more efficient mousetrap, and it will impact every aspect of high school, collegiate, and professional sports.[4]

From my perspective, the sports analytics revolution also happens to offer an instructive way for traders to digest trend following from an alternate vantage. Sabermetrics might be the best *new* illustration for bringing people into the study of *numbers* to the exclusion of fundamentals.

## Baseball

*Failure is not fatal, but failure to change might be.*
John Wooden

Baseball has always been a passion of mine. My playing career went from Little League into college for one year, and I've watched more baseball than I care to admit. My childhood friend Kevin Gallaher even made the Houston Astros 40-man roster for a few years in the 1990s. We played and talked baseball on almost every team for 10 years as kids, then into high school and during summers while in college. To this day I admire from afar, for example, David Ortiz's 2016 hitting in his last season and at his age (40): 38 homeruns, 48 doubles, 127 runs batted in, and a .315 batting average. Awesome.

I love this game and the numbers that go with it. And I've known instinctively for some time that baseball and trend following have much in common. But it wasn't until the revolution, when everyone was acknowledging the *numbers*, that the similarities truly hit me. Not surprisingly, this was about the time trend follower John W. Henry bought the Boston Red Sox.

Henry connects baseball and trend following in Michael Lewis's *Moneyball*: "People in both fields [stock market and baseball] operate with beliefs and biases. To the extent that you can eliminate both and replace them with data, you gain a clear advantage. Many people think they are smarter than others in the stock market and that the market itself has no intrinsic intelligence as if it's inert. Many people think they are smarter than others in baseball and that the game on the field is simply what they think through their set of images/beliefs. Actual data

* Note: More on Nate Silver in Chapter 9.

from the market means more than individual perception/belief. The same is true in baseball."[5]

And as is evident in trend following performance data, trend followers like David Harding, Bill Dunn, and John W. Henry swing for the fence. They hit home runs in performance. If they coached a baseball team they would be Earl Weaver, the former manager of the Baltimore Orioles. He designed his offenses to maximize the chance of a three-run homer. He didn't bunt, and he had a special taste for guys who got on base and guys who hit home runs.[6]

*The general complacency of baseball people—even those of undoubted intelligence—toward mathematical examination of what they regard properly and strictly as their own dish of tea is not too astonishing. I would be willing to go as far as pretending to understand why none of four competent and successful executives of second-division ball clubs were most reluctant to employ probabilistic methods of any description . . . but they did not even want to hear about them!*

Earnshaw Cook[7]

Ed Seykota uses a clever baseball analogy to explain his view of absolute returns (and home runs): "When you're up to bat, it doesn't pay to *hedge* your swing. True for stocks and true for [Barry] Bonds."[9] Lesson: If you are going to play, play hard. Swing with determination and if you miss, so be it. You will get another swing.

Babe Ruth, hero of the Yankees, hero of baseball, and arguably one of the greatest sports legends of all time was known for his prolific home runs. However, he had another habit not talked about as much: striking out. In fact, even with a lifetime batting average of .342, he spent a lot of time going back to the dugout *out.* From a pure numbers perspective, he saw more failure than success. Ruth understood the big home runs helped more than the strikeouts hurt. He summarized his philosophy: "Every strike brings me closer to the next home run."

Richard Driehaus, a successful trader who has made millions trading trends, backed Ruth: "A third paradigm [pushed in the financial press] is don't try to hit home runs—you make the most money by hitting a lot of singles. I couldn't disagree more. I believe you can make the most money hitting home runs. But, you also need a discipline to avoid striking out. That is my sell, discipline. I try to cut my losses and let my winners run."[10]

*Life is too dynamic to remain static.*

John W. Henry[8]

But swinging for the fence is often characterized as reckless by the indoctrinated and or uninitiated. One trading competitor once said John W. Henry was Dave Kingman, referring to the ex-ballplayer famous for either hitting home runs or striking out. Henry saw talk as unfair: "I've been doing this for 20 years, and every time there's a change in the market, they say I should change my ways. But every time there's a period when we don't do well, it's followed by one in which we do extraordinarily well."[11] Henry's multi-decade performance was much closer to Babe Ruth's than Kingman's. Consider the actual hitting statistics of Ruth and Kingman (see Table 5.1).

*Even before he trained with legend Richard Dennis, Jim DiMaria had learned an important trading principle in the less lucrative arena of baseball statistics: The players who score the most runs are home run hitters, not those with consistent batting records. "It's the same with trading. Consistency is something to strive for, but it's not always optimal. Trading is a waiting game. You sit and wait and make a lot of money all at once. The profits tend to come in bunches. The secret is to go sideways between the home runs, not lose too much between them."*[12]

*"What kind of people are getting rich these days? People like John W. Henry." That is, people on the nerdly end of the spectrum who have a comfort with both statistical analysis and decision-making in an uncertain environment.*

Michael Lewis[13]

*When John W. Henry purchased the Boston Red Sox, he understood that a combination of good management and hard science was the most efficient way to run a major league baseball team. As a trend follower, Henry had been exploiting market inefficiencies for decades.*

Michael Lewis[14]

**TABLE 5.1:** Babe Ruth versus Dave Kingman

| | Babe Ruth | Dave Kingman |
|---|---|---|
| At Bats | 8,399 | 6,677 |
| Hits | 2,873 | 1,575 |
| Runs | 2,174 | 901 |
| Home Runs | 714 | 442 |
| Batting Average | .342 | .236 |
| Slugging | .690 | .478 |

Compare the slugging percentages. Kingman could not be considered a great run producer by any measure. On the other hand, John W. Henry's performance numbers were consistently outsized. He had a great slugging percentage. Of course, most want the fantasy: big homeruns, but zero strikeouts.

To further illustrate, consider a modern-day example: blue-collar Joe versus the entrepreneur. Blue-collar Joe is paid the same sum every two weeks like clockwork. In terms of *winning percentage*, blue collar Joe is king: His ratio of hours worked to hours paid is one to one, a perfect 100 percent. He has a steady job and a steady life. But the security he feels is an illusion—his paycheck comes at the whim of his local economy, his industry, and even the foreman of his plant. The pay isn't exactly impressive; it gives him a solid, livable life, but not much more.

In contrast, consider the entrepreneur, the trader or the trend follower. Paydays are wildly irregular. He frequently goes for months, sometimes years, without seeing tangible reward for his sweat and toil. The winning percentage is, in a word, pathetic. For every 10 big ideas or trades he has, 7 of them wind up in the circular file. Of the remaining three, two of those fizzle out within a year—another big chunk of time, money, and effort down the drain. However, don't feel too sorry for the poor entrepreneur or trend trader who spends time losing. He has a passion for life, he controls his own destiny, and his last idea/trade paid off with a seven-figure check.

## Billy Beane

Famed sports agent Leigh Steinberg sets the modern sports-and-numbers stage: "Winning in team sports has always been a function of superior ownership, front offices and coaching. Decision making as

which players to draft, trade, develop, coach and which system to play have traditionally been made by a *gut* feeling or adherence to past traditions. But then came Oakland Athletics' General Manager, former ballplayer Billy Beane."[15]

*Moneyball* made Beane's no fancy stadium, poor owner story famous. In fact, his small-market team's payroll is miniscule compared to the Yankees. However, his teams have been some of the best and they have reached the playoffs a lot.

The philosophy Billy Beane helped unleash has proved almost all of the old baseball truisms to be false, i.e., talent, character, chemistry. The genius behind sabermetrics was a mechanical engineer named Earnshaw Cook, who, in the early 1960s, compiled reams of data that overturned baseball's conventional wisdom. However, when he presented the data to executives at struggling teams, they pushed him away. Cook then wrote a book called *Percentage Baseball*, based on his statistical research that was irrefutable.[16]

Look closer at Beane's approach to baseball and you learn he uses actuarial analysis to determine the odds of a high school pitcher becoming a major leaguer. And, in drafting and acquiring talent, he relies on those sabermetric truths. For instance, if a team draws a lot of walks and hits a lot of home runs while giving up few of each, that team will win a lot of ballgames. Not surprisingly, Beane has stocked his team with sluggers who take walks and control pitchers who rarely give up home runs.[19]

*When I started writing I thought if I proved X was a stupid thing to do that people would stop doing X. I was wrong.*

Bill James

## Bill James

What Earnshaw Cook started, Bill James took to a deity level. James defined sabermetrics as "the search for objective knowledge about baseball." Thus, sabermetrics attempts to answer objective questions about baseball, such as "which player on the Red Sox contributed the most to the team's offense?" or "How many home runs will Ken Griffey hit next year?" It cannot deal with the subjective judgments, which are also important to the game, such as "Who is your favorite player?" or "That was a great game."[20] Sabermetrics challenges our perceptions, which are often misguided from emotional bias.[21]

James' enduring work from his 1981 Baseball Abstract illustrates his unique take by contrasting sports writing with sabermetrics:

1. Sports writing draws on the available evidence, and forces conclusions by selecting and arranging that evidence so that it points in the direction

*There is a core of institutional investment managers, primarily in Europe, who manage billions of dollars for clients, who have waited for me to fail for more than 20 years. They have an inherent bias against the notion that data or mechanical formulas can lead to success over time in markets. They have personally watched my success now for more than 20 years. Yet, if anything, they are now no more convinced than they were 20 years ago that I am going to be successful in the future using data over analysis. I am not legendary on Wall Street or off. Bill James is, and I assume the inherent bias against him within baseball will increase now that he has taken sides.*

John W. Henry[17]

desired. Sabermetrics introduces new evidence, previously unknown data derived from original source material.[22]

*John W. Henry knew a dispassionate statistical investigation could be used to help shape a baseball team. "It is remarkably similar, I just happened to apply 'quant' to an area that's extremely lucrative."*[18]

2. Sports writing designs its analysis to fit the situation being discussed; sabermetrics designs methods which would be applicable not only in the present case but in any other comparable situation. The sportswriter says this player is better than that one because this player had 20 more home runs, 10 more doubles, and 40 more walks and those things are more important than a players 60 extra base hits and 31 extra stolen bases, and besides, there is always defense and if all else fails, team leadership. If player C is introduced into this discussion, he is a whole new article. Sabermetrics puts into place formulas, schematic designs, or theories of relationships, which could compare not only this player to that one, but to any player who might be introduced into the discussion.[23]
3. Sportswriters characteristically begin their analysis with a position on an issue; sabermetrics begins with the issue itself. The most over-used form in journalism is the diatribe, the endless impassioned and quasi-logical pitches for the cause of the day—Mike Norris for the Cy Young Award, Rickey Henderson for MVP, Gil Hodges for the Hall of Fame, everybody for lower salaries and let's all line up against the DH. Sports writing "analysis" is largely an adversary process, with the most successful sportswriter being the one who is the most effective advocate of his position. . . . sabermetrics by its nature is unemotional, and non-committal. The sportswriter attempts to be a good lawyer; the sabermetrician, a fair judge.[24]

*The nature of markets is to trend. The nature of life is to trend.*
John W. Henry[26]

*I feel I've had an advantage over the years because I am clear about a couple of things: It is part of the nature of life itself to trend, and I will never have a complete or full understanding of anything. Therefore, all investment decisions should be based on what can be measured rather than what might be predicted or felt.*
John W. Henry[27]

Trend following's connection with baseball picked up major steam when John W. Henry hired Bill James. James, the consummate outsider, was brought in to statistically enrich Henry's Red Sox with his numbers-centric perspective. But James' controversial views are harsh medicine for old-time baseball professionals. For example, he was blunt in his negative assessment of Don Zimmer, the former Yankees coach, and others: "An assortment of half-wits, nincompoops, and Neanderthals like Don Zimmer who are not only allowed to pontificate on whatever strikes them, but are actually solicited and employed to do this."[25]

Bad feelings from the baseball establishment toward James are mutual: "A little fat guy with a beard who knows nothing about nothing," is how Hall of Fame manager Sparky Anderson once described James, who's neither short nor fat.[28]

Personalities aside, John W. Henry knew baseball strategy had to change. Henry was convinced baseball was putting too much emphasis on tools—baseball jargon for athletic ability—and not enough on performance. The on-the-field success of the Oakland A's, then the only team using sabermetrics, confirmed Henry's view. Henry's first team, the Florida Marlins, would draft athletes, while the A's would draft baseball players.[29]

Part of the problem, from both Henry and James's perspective, was the old guard's love of an Adonis athlete over pure production—hitting, power, and plate discipline. Would you rather have Tim Tebow, who looks the physical part, or David Ortiz, with the Hall of Fame statistics and a healthy midsection? To Henry, in both baseball and trend trading, *producing* must be the goal: "People in both baseball and the financial markets operate with beliefs and biases. To the extent you can eliminate both and replace them with data, you gain a clear advantage. Many people think they are smarter than others in the stock market, and that the market itself has no intrinsic intelligence—as if it's inert. Similarly, many people think they are smarter than others in baseball, and that the game on the field is simply what they think it is, filtered through their set of images and beliefs. But actual data from the market means more than individual perception/belief. And the same is true in baseball."[31]

## Stats Take Over

Boston Red Sox Nation still debates whether Pedro Martinez should have been lifted in the eighth inning of game 7 of the 2003 American League Championship Series against the Yankees. He was left in, and the Yankees rallied from three runs down to win the series. Red Sox manager Grady Little was blamed for Boston's loss and fired soon thereafter. Many wondered if he was unfairly scapegoated for a decision others might have made, too. After all, Martinez was his ace, and the manager's *gut* told him to stay with his ace.

Perhaps in this situation, Martinez gets through the eighth 9 times out of 10. After all, the percentage of innings in which a pitcher gives up three or more runs is small, and Martinez was a Hall of Fame pitcher. However, the numbers say leaving him in was the absolutely wrong

*For nearly 25 years, there's been a huge food fight in baseball. The argument was basic: How do you evaluate a player? On one side were general managers, scouts and managers. For the most part, they evaluated players the old-fashioned way—with their eyes, stopwatches, and radar guns and by looking at statistics which were popularized in the nineteenth century. Their mind-set was always, "How fast does he run? How hard does he throw? What's his batting average? Does he look like a major leaguer should look?" On the other side—led by statistical gurus such as Bill James and Pete Palmer, and assisted by countless lesser* seamheads *(including, at times, me)—were the geeks, the outsiders, mere fans, who thought they knew better.*

Thomas Boswell
*The Washington Post*[30]

*It's like any field. There's a vested interest in maintaining the status quo so you don't have to learn anything new.*

Rob Neyer
ESPN[32]

decision. After 105 pitches in a given start, his batting average against rises to .370. He ended up throwing 123 pitches in Game 7.

The firing of Grady Little ultimately was all about *numbers*:

> Grady isn't a stats guy, plain and simple. He's an old school manager who goes with his gut and defers to his partially informed conscience when making decisions. Contrast this with the front office, which has transformed itself into a sabermetric, number-crunching machine, and the divide is clear as day—Fast forward to the eighth inning of Game 7 of the ALCS. Grady sends Pedro back onto the mound to the surprise of many who assumed he would be yanked after throwing exactly 100 pitches. Opponents hit .364 off Pedro this year after his 105th pitch—even Tony Clark could hit Pedro in the late innings.[33]

*I had learned something from publishing* Moneyball. *I learned that if you look long enough for an argument against reason, you will find it.*
Michael Lewis[34]

The late, great Stephen Jay Gould, a numbers man himself (read his fantastic *The Median Isn't the Message* about cancer treatments online) and lifelong baseball fan, offered indirect insight into the decision-making process that left Pedro Martinez in:

> Everybody knows about hot hands. The only problem is that no such phenomenon exists. The Stanford psychologist Amos Tversky studied every basket made by the Philadelphia 76ers for more than a season. He found, first of all, that probabilities of making a second basket did not rise following a successful shot. Moreover, the number of "runs," or baskets in succession, was no greater than what a standard random, or coin-tossing, model would predict. Of course Larry Bird, the great forward of the Boston Celtics, will have more sequences of five than Joe Airball—but not because he has greater will or gets in that magic rhythm more often. Bird has longer runs because his average success rate is so much higher, and random models predict more frequent and longer sequences. If Bird shoots field goals at 0.6 probability of success, he will get five in a row about once every 13 sequences (0.65). If Joe, by contrast, shoots only 0.3, he will get his five straight only about once in 412 times. In other words, we need no special explanation for the apparent pattern of long runs. There is no ineffable "causality of circumstance" (if I may call it that), no definite reason born of the particulars that make for heroic myths—courage in the clinch, strength in

> adversity, etc. You only have to know a person's ordinary play in order to predict his sequences.[35]

Gould's friend, Ed Purcell, a Nobel laureate in Physics, conducted intense research on baseball streaks. He concluded that nothing ever happened in baseball above and beyond the frequency predicted by coin-tossing models. The longest runs of wins and losses are as long as they should be.[36]

Had Grady Little played the *numbers* the Red Sox would not have waited until 2004 to finally win the World Series (which they won again in 2007 and 2013). In fact, the 2016 World Series pitted the Chicago Cubs against the Cleveland Indians—two very sabermetrics baseball clubs run by Theo Epstein and Terry Francona, the very two men who most helped John W. Henry win the 2004 and 2007 World Series. One argument against analytics 10 years ago was it would make baseball boring, but the 2016 playoffs were viewed as very exciting. These teams were doing things differently, a big reason for the excitement. Plus, the Chicago Cubs won their first world championship in 108 years—now that's a number![38]

However, let's be clear: This is not only a baseball evolution. Since Billy Beane first started utilizing statistical predictors, every Major League Baseball team has adopted a copycat system to an extent, the NFL now hires analytics executives, and the NBA has introduced the most sophisticated technologies in terms of performance information.[39]

Look no further than the NBA's Golden State Warriors and Stephen Curry: "What's really interesting is sometimes in venture capital and doing startups the whole world can be wrong," said the team's primary owner, Joe Lacob, a longtime partner at Silicon Valley venture capital firm Kleiner Perkins Caufield & Byers. "No one really executed a game plan—a team-building architecture—around the 3-pointer."[40]

From the beginning of his ownership, Lacob placed unusually strong emphasis on *numbers.* Their initial data research yielded many insights, but the Warriors eventually zeroed in on the 3-point line. NBA players made roughly the same percentage of shots from 23 feet as they did from 24. But because the three-point line ran between them, the values of those two shots were radically different. Shot attempts from 23 feet had an average value of 0.76 points, while 24-footers were worth 1.09. This, the Warriors concluded, was an opportunity. By moving back a few inches before shooting, a basketball player could improve his rate of return by 43 percent.[41]

*When Grady Little let Pedro continue pitching into the eighth in Game 7 of the ALCS against the Yankees, he provided the perfect demonstrator of why the Red Sox fired him after his second winning season in Boston. Little explained his move (which allowed the Yankees to tie and eventually win) after the game: "We trained him to work just like that deep into a game. When he tells me he has enough in the tank to keep going, that's the man I want out there. That's no different than what we've done the last two years." In fact, the stats said just the opposite. Pedro pitched into the eighth only five times in his 29 regular-season starts, and simply didn't pitch well after he'd thrown 100 pitches, the number he'd tossed before taking the mound in the eighth. In fact, during 2003, opponents' batting averages went up .139 after Pedro tossed his 105th pitch—strong evidence that he'd continue to weaken. That it would turn out badly was likely, as most everyone knew—and as the Red Sox computers knew.*[37]

That type of thinking and what many of these new data sources have in common is an emphasis on *process*. Outcomes such as strikes, walks, home runs, three-point shooting, and so forth—are already well tracked. But this new generation of data allows analysts to understand how those outcomes are generated, perhaps even down to the level of a player's brain activity.[42]

Nonetheless it will be a fight every step of the way, as curmudgeonly New York Mets manager Terry Collins growled in early 2016:

> I'm not sure how much an old-school guy can add to the game today. It's become a young man's game, especially with all of the technology stuff you've got to be involved in. I'm not very good at it. I don't enjoy it like other people do. I'm not going to sit there today and look at all of these [expletive] numbers and try to predict this guy is going to be a great player. OPS this. OPS that. GPS. LCSs. DSDs. You know who has good numbers? Good [expletive] players. That's just me. I don't have to apologize to anybody.[43]

Ego is a *killer.*

*Jack Lambert couldn't get on the field as a backup linebacker. . . . The kid in front of him was really their leader, kind of the heart and soul of the Kent State defense. . . . Through a series of circumstances the kid dropped out of school and went to work for Mick Jagger; he was his security guy on tour with the Stones, and Lambert became the starting middle linebacker. He probably would have never played had that not happened. And you have a Hall of Fame player. Sometimes things take a turn, and then once some players get that opportunity and they get in there—the Tom Bradys of the world, or whoever—you can't get them out of there—[like] Lou Gehrig.*[44]

Bill Belichick
October 2016
New England Patriots press conference

## Summary Food for Thought

- Thinking in terms of odds, finding that edge, is a common denominator for baseball and trend following.
- Bill James: "I always admire people who have the courage to confront the conventional wisdom—people within the system. Those of us on the outside, it's easy for us to say whatever we think, because there are no consequences to it. It's much harder to say, 'I think the conventional wisdom is full of beans, and I'm not going to go along with it,' when you're inside the system and exposed to the possibility of actual failure. I think the people who do this drive the world to get better, whereas the people who snipe at anybody who dares suggest that the conventional wisdom is malarkey are, in my view, gutless conspirators in the mediocrity of the universe."
- Leonard Koppett in *A Thinking Man's Guide to Baseball* (1967): "Statistics are the lifeblood of baseball. In no other sport are so many available and studied so assiduously by participants and fans. Much of the game's appeal, as a conversation piece, lies in the opportunity the

*Sabermetrics is an unlikely marriage between mathematicians and jock culture.*[45]

fan gets to back up opinions and arguments with convincing figures, and it is entirely possible that more American boys have mastered long division by dealing with batting averages than in any other way."

- Paul Fisher: "A passion for statistics is the earmark of a literate people."
- Steven Pinker: "Cognitive psychology tells us that the unaided human mind is vulnerable to many fallacies and illusions because of its reliance on its memory for vivid anecdotes rather than systematic statistics."
- Jameis Winston on staying NFL focused: "We're just trying to be 1-0 every week. It's so easy to think about the future, but it doesn't help you."

*The truth of a theory is in your mind, not in your eyes.*
Albert Einstein[46]