

Below is an interview we conducted with Michael Mauboussin, author of the recently published book *Think Twice: Harnessing the Power of Counterintuition* (Harvard Business Press), and Chief Investment Strategist at Legg Mason Capital Management. We hope you enjoy the interview and book as much as we did.

Congratulations on your new book! Kris and I thoroughly enjoyed it. Rather than write a book review of Think Twice for our readers, we thought it might be better to explore some of the material with you in an interview. We appreciate you taking time out of your busy schedule to spend time with us today.

MM: Thanks, Steve. It's really a pleasure to be with you.

Can you give us a quick synopsis of what the book is about and what inspired you to write it?

MM: The basic idea of the book is that when you are faced with certain types of situations, your mind will naturally think about it one way when there is a better way to think about it. That your mind takes you down a specific, and incorrect, path can lead to poor decisions.

Let me give you an incredibly simple math problem as an example:

A bat and a ball together cost \$1.10. The bat costs \$1.00 more than the ball. How much does the ball cost?

If you're a normal person, you either answered \$0.10 or \$0.10 was the first number that came to mind. The right answer, of course, is \$0.05. Answering \$0.10 is basically automatic. You need to think twice to avoid it.

This question is one of three that comprise the cognitive reflection test, devised by a psychologist named Shane Frederick. I have been asking this question in my talks lately, and it definitely illustrates the main theme of *Think Twice* effectively.

Why did I write the book? Well, like you, I have spent a lot of time thinking about, teaching, and practicing the process of investment decision making. And one of the things that has become very clear to me over the years is that the key to being a great investor is a lot less about spreadsheets than it is about thinking well. Yet the vast majority of what we teach in business school is the trade of investing—valuation, strategy, portfolio structure, etc. Don't get me wrong, those things are important. But what distinguishes the great investors is not the Excel models, but their mental processes. *Think Twice* is an effort to help all professional decision makers in that facet of their career.

In the book, you say that in a probabilistic environment, we are better served by focusing on the process by which we make a decision than on the outcome. That seems right on the money. Can you talk about this a little more as applied to investing?

MM: First off, let me say I understand why people are focused on outcomes. Outcomes are objective. They are audited. And they are how we keep score. So it is very tempting to dwell on outcomes.



But in fields that are probabilistic, where a good decision can lead to a poor outcome—and vice versa—a focus on outcomes is misplaced, because you don't know if you were right for the right reason.

Let me be more concrete. Standard blackjack strategy says you should sit on cards that add up to 17. That rule comes from a study of probabilities; in other words, over many trials you'll be better off sitting on a 17 than asking for a hit. But that doesn't mean that people who ask for an additional card don't get a 4 from time to time. In that case, luck has made their hand. And you know that if they always ask for a hit while sitting on a 17, they'll be much worse off than someone who always sits on the hand.

So in any probabilistic endeavor, you want to focus on an economically sound process, with the conviction that over time a good process provides the best chance for a good outcome. But you also need to acknowledge that even if you follow the right process, the outcomes will be unfavorable due to the inherent nature of chance.

Early on in the book, you observe that information without context is falsely empowering. When I read that I thought about all the CNBC viewers trying to pick up stock tips and investment ideas during a 30 minute or one hour program. There's a lot of information thrown out during any one segment, but very little context, which seems dangerous to me – falsely empowering, as you put it. Can you comment on this?

MM: Wow, this is a big one. Two thoughts come immediately to my mind.

The first is that when faced with a decision, most people naturally go into information-collection mode. They spend a depressingly little amount of time thinking about the type of problem they face. This can lead to a false sense of confidence.

One illustration comes from the theme of the book's first chapter, which is an inappropriate reliance on the "inside" versus the "outside" view. With the inside view, you gather information and use that information, along with your other unique inputs, to project outcomes in the future. This is the way people naturally operate, whether it's contemplating a renovation to their kitchen, launching a new product, or thinking about the likely returns from the stock market.

The outside view, by way of contrast, looks at a problem as an instance of a larger reference class. In other words, it asks a really simple question: when other people were in this situation, what happened? So the outside view contributes some crucial context to your decision by providing base rate data that can be very informative and useful.

The second thought relates to the application of theory. Here's a pattern that's depressingly common: Researchers study a company that has recently enjoyed success, extract some attributes from that company, and suggest that those attributes are the keys for *every* company to succeed. Stated differently, researchers try to cram what's worked in one situation into all situations. My bookshelf is filled with books that show "what really works" or the "seven keys to success." Most of these are totally bogus. But they sell well because they tell people what they want to hear: "If you do the following, you will succeed." Life is not so easy.

Let's talk about some of the mistakes people routinely make in their decision making process. Your book is full of them. What are the ones you see most frequently on Wall Street and in the business world?

MM: I mentioned the inside versus outside view, and that's a big one. My colleague Bill Miller recently wrote about an example that makes the point. It seems that the consensus on Wall Street is the "new normal," that

future rates of economic growth will be slower for a host of reasons. That's the inside view. But the outside view would ask: what's the best way to predict the magnitude of the recovery in GDP growth? Well, economists have studied this in some detail and the answer is: the magnitude of the decline. And we've just come off one of the sharpest drops in decades.

A regression that fits past declines with subsequent increases places 2010 GDP growth at 8-9 percent. The current consensus is 2.4 percent. That's a heck of a gap. Now I certainly wouldn't argue for 8 percent growth in 2010, but the outside view may incline one to believe growth is more likely to be faster than consensus than slower.

Another common mistake is the failure to understand the contributions of skill and luck in outcomes. In any system that combines skill and luck, you will see reversion to the mean. Investors are not good at considering mean reversion in their decision making.

I provide an example in the book that was based on research by a pair of professors of finance. They studied the decisions to hire and fire money managers of over 3,200 plan sponsors—supposedly the most sophisticated of investors—over a decade. The sponsors tended to hire managers who had outperformed their benchmarks in the preceding period and to fire those who had underperformed. But, as mean reversion would predict, they found that the fired managers outperformed the hired managers in the two years subsequent to the decision. It goes back to your question before about process and outcome. It's really hard for people—even those who should know better—to avoid focusing too much on outcomes.

You have a term in chapter three of your book called the expert squeeze. Sounds like something important is going on here, tell us more about it.

MM: The basic idea is that experts are losing their usefulness in a lot of decision-making settings to computers, or algorithms, on the one side and to collectives, or the wisdom of crowds, on the other. And of course there's a big, common driver in both cases: technology. Advances in computing power and social networking software are allowing us to tap more methods to solve problems.

Let me add a couple of points. First off, it's important to recognize *when* either algorithms or crowds will be effective. I offer a continuum. On the one side are problems that are rules based with limited ranges of outcomes. This is a world where computers thrive. For example, computers can comb through the massive data companies collect about their customers and illustrate useful patterns. Cinematch, Netflix's program that matches viewers and DVDs, is a great example. Cinematch is obviously going to be a heck of a lot more accurate than an expert in providing good recommendations.

The other end of the continuum has problems that are probabilistic with large ranges of outcomes. Here, crowds forecast better than experts—when certain conditions are in place. Prediction markets are a great example. These markets consistently predict better than even the most learned experts.

I'll mention one story that's not in the book. In order to determine the book's title, I hosted a "title tournament" using Amazon.com's Mechanical Turk. It was totally cool. We actually asked a large random group which title or titles they liked best, offering a micro payment for their answers. In a short time, we got clear feedback on the perception of the contending titles. As I like to say, it's a great feeling knowing that a large number of random people willing to answer a question for \$0.10 determined the title of my book. But it's the truth!

A final thought is that humans really do prefer to defer to an expert. We're looking for experts in all facets of our lives to help guide our decisions. In some realms experts are great and super valuable. But for lots of problems, including most of those associated with markets, the record of experts is dismal.

There's a nice discussion in Think Twice about the science of complexity and diversity (of opinion) breakdowns. What does complexity theory tell us about the importance of diversity of opinion in a place like Wall Street or in global capital markets?

MM: You can describe complex adaptive systems at three levels. First, you have a group of heterogeneous, or diverse, agents. These could be investors in a market, neurons in your brain, or ants in an ant colony. Second, you have to let these agents interact with one another. And finally, what emerges is a global system—the stock market, consciousness, the ant colony. It's important to stress that the whole is greater than the sum of the parts. This means that reductionism doesn't work. You can't understand the system by studying the parts. Just as the ants can't tell you what's going on at the colony level, you can be pretty sure that any individual investor has a very limited grasp of the market's workings.

For each of these systems to operate effectively, though, you need to have diversity of the underlying agents. By the way, all of these systems have periodic failures. Sometimes the failure is the result of an external shock. But more often the failures are the result of the internal workings of the system. They are endogenous failures. In markets there are booms and crashes, in brains it is epilepsy—synchronized firing of neurons—and in ant colonies it's circular mills, when the ants follow each other around in a circle until they die. And all of these failures have a common root: a breakdown in diversity. Rather than the agents operating independently, their behavior is coordinated. Not surprisingly, we rarely see these types of breakdowns in nature, in large part because evolution has found ways to ensure diversity. But under certain conditions you see diversity breakdowns in all of these systems.

It's now pretty easy to see how that would apply to Wall Street. When views are diverse and properly aggregated, you're going to get pretty efficient markets. But when diversity breaks down and people start to imitate one another, you will get inefficiency. The challenge is that you will feel the strongest inclination to go with the crowd precisely when the inefficiencies are greatest. This is by definition true.

The institutional imperative is Warren Buffett's phrase to explain the tendency of organizations to mindlessly imitate what peers are doing. How can executives watch out for the institutional imperative?

MM: One of the best ways to guard against mindless imitation is to constantly ask the naïve question: Why are we doing this? So, for example, why are we paying people this way? Why are we in this business? Why are we providing earnings guidance? Why are we proposing the M&A deal? Asking the naïve question was one of Peter Drucker's tricks, and if you do it frequently enough and answer honestly, it'll lead to good thinking.

Good decisions come with sound answers to the "why" question. Buffett tells a great story about an executive trying to make his case for acquiring another company. After failing to convince the board of directors of the deal's virtue, he basically says, "aw, c'mon folks, all the other kids are doing it." Whenever you get an answer like that, look out.

What do ant colonies and bee hives tell us about effective decision making on Wall Street and in the business world?

MM: I am fascinated by how social insects solve difficult problems. They deal with complex tasks with no one in charge and with limited individual smarts. Yet the results are simply amazing.

The two big lessons for me are about the power of collectives and diversity. While humans naturally want to defer to an expert to make a decision, social insects demonstrate that hard problems—for them, matters of life and death—can be successfully handled by the hive. This is an idea that runs very counter to how humans think. Time and time again, I have heard executives express misgivings about the stock market or prediction markets. People just don't feel comfortable with the notion of collective decision making.

The second lesson is something we've already discussed—diversity. Many organizations will tell you they are committed to diversity, but often what they're committed to is social identity diversity—gender, race, age, religion, etc. But what really matters is *cognitive* diversity. That's true in organizations and in markets.

You spend time discussing mean reversion in the book. You note that when it comes to reversion to the mean, they make three kinds of mistakes. Please elaborate.

MM: The first mistake is to ignore it all together. In the example I cited before, about plan sponsors hiring outperforming managers and firing underperforming ones, that's what's going on. Another story comes to mind. I was once presenting on reversion to the mean to the senior management of a company. They nodded along knowingly. But then the CEO proceeded to insist that while they understood and agreed with the concept of reversion to the mean, they had figured out how to avoid it. Suffice it to say that they did not avoid it, as their subsequent financial performance attested.

The second mistake is to misinterpret what reversion to the mean says. People sometimes believe it means that results tend to migrate toward average. But that's not really what's going on. It is accurate to say that if a recent outcome benefitted from lots of skill and lots of luck, the next outcome will likely be closer to the average as the good luck is unlikely to persist. But by the same token, an outcome that was average may be followed by an outcome that's much better or worse if good or bad luck comes into play, which is repulsion from the mean. The big idea is that even if the distribution stays the same over time—say, for corporate returns on invested capital—luck will reshuffle the positions of the companies. There is no tendency toward mediocrity, just draws from the bin of luck.

The final mistake is the tendency to confuse feedback with mean reversion. For example, if your daughter comes home with a really great grade on her math test, which is likely to be part skill and part luck, you might praise her for her good work. You'll then likely see her next test score be not quite as good, as her good luck may not continue. So you might think that your praise was the problem, when in fact her performance simply reflected mean reversion.

Of course, the same is true of criticism. Pretend your daughter comes home with a very poor grade on her math test and you read her the riot act. She'll likely do better on the next one as the result of better luck. So you might falsely conclude that your criticism helped her.

What is the greatest lesson and opportunity from understanding reversion to the mean?

MM: One big insight for me is that you should focus feedback only on the part of performance that is under the individual's control. That's very easy to say, but really hard to do. For example, when evaluating the performance of an associate, you must do your best to focus the analysis on the process.

The opportunity lies in seeing it where others don't. If you witness performance that is at the extremes—either good or bad—recognize that such performance is unlikely to persist. There's a whole strand of research

that studies the media and shows that when a company is celebrated the best times are likely behind it, and when a company is taken to task as being no good better days often lay ahead.

Twitter's second in command frankly admitted recently that he really didn't know how to describe the company yet, despite being all the rage today. It sounds to me like he is thinking twice. It also sounds like he subscribes to Daniel Kahneman's formula for success and great success in the 21st century. Do you agree?

MM: I didn't see that quote so can't comment on it directly. But I will say that it may be difficult to describe a company that has had success in attracting users without yet having fleshed out a business model. This was true of Google in the early days, too.

I'd also say it's good to be mindful not to get "fooled by randomness," as Nassim Taleb would say. Too often, people attribute their successes to smarts, when the truth is they were just lucky. As Kahneman noted, great success combines good skill with a lot of luck. It's important to acknowledge both.

I've long been fascinated by the Halo effect – the human proclivity to make specific inferences based on general impressions - and was glad to see you discuss it in your book. You do a lot of meeting with company executives in your position as Chief Investment Strategist at Legg Mason Capital Management. What's the reaction of executives when you discuss the Halo effect?

MM: They have no idea what I'm talking about!

Seriously, the main lesson for executives is that you have to be careful about drawing lessons from success stories. As we discussed before, a lot of what makes for success or failure is based on circumstances. The problem is people want stories. The common denominator of the best-selling business how-to books is that they tell great stories. Never mind that the research is flawed. The stories carry the day.

You mention that people shouldn't think twice before every decision. When are the best times to think twice?

MM: Yeah, the fact is that most of your decisions will either have a clear answer or will not be consequential. Of course, you won't need to think twice in those instances.

But there are certain situations when your mind will want to approach the problem in a way that's suboptimal. I recommend three steps. The first is to prepare—basically to learn about these situations. I describe eight of them in the book. So read about them, learn about them, and build your mental database.

Second is recognition. These situations will show up in various guises in different fields. Once you learn about these situations, you'll see them in your professional life, your personal life, and even while watching a ballgame on TV. Once you've got these situations down, you'll see them everywhere.

Finally, I offer ways to deal with these situations. Each chapter offers some specific ideas on how to mitigate, or manage, the mistakes.

I want to emphasize one point. *Think Twice* is really about opportunity. A lot of decision making books are satisfied to point out that people are far from rational in their decision making. This, of course, is true. But it doesn't leave you feeling very good.

Think Twice turns this on its head and suggests that you consider the upside in these mistakes. The opportunity comes in two flavors. First is, of course, reducing your own mistakes. This is like the tennis player who makes less unforced errors. Fewer mistakes equal better outcomes. Second, you can take

advantage of these mistakes when other people make them. Precisely because these mistakes are so prevalent and difficult to manage, they will present opportunity.

In the final chapter you talk about things people can do to improve their decision making. What are two or three most important things in your opinion?

MM: The starting point is to learn about the mistakes. That's really valuable and helpful. Next is to keep a decision-making journal. When you make a decision of consequence, write down what you decided, how you came to that decision, and what you expect to happen. If you're so inclined, note how you feel emotionally and physically. The decision journal will present an opportunity to audit your decisions, effectively giving yourself feedback. One of the most powerful biases around is hindsight bias. Once we know what happened, we somehow think we saw it coming. Our rearview mirror provides 20/20 vision into the past. But having your decisions written in your hand will offset that bias.

I'd also recommend putting yourself in the shoes of others. One area where this is helpful is in assessing incentives. What motivates people to do what they do? Try not to judge so much as to understand. And when you understand what makes people tick, you're in a much better position to anticipate and appreciate how they decide.

There is so much more about the book we could discuss, but you've been gracious with your time and we appreciate it. Thanks again for sharing your thoughts with us. We wish you all the best with the new book and look forward to your future efforts.

MM: Thank you, Steve. The pleasure was mine.

About Michael Mauboussin:

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