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Michael Mauboussin on His Book, More Than You Know

We had the pleasure of chatting with renowned investment strategist Michael Mauboussin, Head of Consilient Research at Counterpoint Global (Morgan Stanley Investment Management), about his book, *More Than You Know: Finding Financial Wisdom in Unconventional Places*.

The following transcript has been edited for space and clarity.

John Mihaljevic: What inspired you to write *More Than You Know*?

Michael Mauboussin: I'll touch on two things. First is some of the influences I had going into that, and then a bit on the specific catalyst for *More Than You Know*. The main theme of *More Than You Know* is that thinking about the world through a multidisciplinary lens will make you a better thinker. It will make you a better person, a better parent, a better spouse. The metaphor I always like to use, which has been well used, is that of a toolkit. If you have a full toolkit containing different types of tools, no matter what problem you face, you'll have the appropriate tool to try solve that problem. If you have just one tool or a couple of blunt tools, you'll be using the wrong tools to try solve problems.

That kind of research — that mindset — has been deeply influenced by a number of sources, and there's a lot of scientific support for the virtues of a multidisciplinary point of view. I'll mention work by two scientists. One is Scott Page at the University of Michigan, who wrote a book that came out in 2007, after *More Than You Know*, called *The Difference*. More recently, he wrote a book called *The Diversity Bonus*. Both of those demonstrate the mathematics — the quantitative case — for why cognitive diversity helps solve difficult problems. This is not just a "wave our hands" concept. There's good evidence that it works.

The second researcher I'll mention is Phil Tetlock at the University of Pennsylvania. In 2006, he wrote an outstanding book called Expert Political Judgement about how difficult it is for experts to make quality forecasts. There was an interesting piece of research in there about how there are different kinds of thinkers, which he called hedgehogs and foxes. This is based on the Isaiah Berlin essay. Hedgehogs are people who have one big idea and they fit their world view into that, while foxes are people who know a bit about many different things and tend not to be wedded to any particular point of view. Tetlock showed that foxes are better forecasters, and are generally better thinkers. Following on from that, he wrote a book called Superforecasters about people who are great forecasters. It turns out that one of the key characteristics of those people is that they are actively open minded. They are thinking about a variety of things and are willing to take on different points of view.

Another big influence is Charlie Munger and his mental models approach. You can read about this — and I'm sure all your members have read it — in Poor Charlie's Almanack, which is a great read and something that every serious investor should go back to read periodically. By the way, I met Charlie Munger for the first time in December. It was a real bucket-list moment for me, and it was awesome. Munger's got a quote which I've always loved, which is if you want to be a good thinker, you must develop a mind that jumps jurisdictional boundaries. That very much is an animating concept.

The last thing I will mention as an influence is the Santa Fe Institute. I'm actually in Santa Fe, New Mexico now. You mentioned I'm chairman of the Board of Trustees. The Santa Fe Institute is an interesting place. It was started about 35 years ago by a number of academics who felt that academia had become too siloed, and that many of the most vexing and interesting problems in our world were

at the intersection of disciplines, so they started an institute to transcend these jurisdictional boundaries and have people work on these difficult problems.

That's a bit of background on the influences. This way of thinking about the world is not everybody's cup of tea, but it's very much in the bones of *More Than You Know*.

To answer your question more directly in terms of how this book came about, I'm one of those people, — which can be slightly annoying — who when they read something or watch something or see something, are always thinking about connections or corrections. I would find myself talking back to my books or talking to my TV, which is not an effective way to go through life. I thought that I should start writing about these connections that I see, or how ideas can spill over from one to the other.

There was also a specific catalyzing moment for me. My wife had a beloved grandfather — a great guy — who, in the summer of 2000, handed me a copy of Time magazine which had Tiger Woods on the cover. Tiger Woods, of course, is a famous golfer, but the story here was that in 1997, so three years prior, he had won the Masters golf tournament at the age of 21. He won it by 12 strokes. It was an extraordinary story. Woods watched the tape of his performance, and he came to the conclusion that his swing was no good. He called his coach and they revamped the swing, and the initial reaction was that he became less effective as a golfer. Then he came roaring back and had a spectacular string of victories with this revamped swing. That immediately conjured in my mind something I had learned about at the Santa Fe Institute, which is a concept called fitness landscapes. Imagine looking out at a landscape with mountains of different heights. Think of the height of each mountain as some measure of fitness or goodness. You go up to a mountain and you're at the peak, but there may be a mountain with a higher peak out there. For you to get to the higher peak, you have to sometimes go into the valley to climb back up to the peak. I thought what Tiger Woods was doing was an excellent illustration of this idea: he was at a local peak — he was the best golfer in the world at the time — but he thought he could be even better, so he degraded his performance for a short period of time to be even better.

That launched me into these essays in the early 2000s. We wrote them every two weeks. I targeted 1,500 words, which is enough to allow you to develop an idea, but fairly short so people would read it. We called it "The Consilient Observer" — that was the name of the original essays. I was inspired by E. O. Wilson's book Consilience, which came out in 1998 and is a book I'd recommend. Consilience is an unusual word. It's about 150 years old, and it means the unification of knowledge. In this book, Wilson argues that for us to advance in the scientific world, we need to appeal to consilience — again, this transdisciplinary effort.

A publisher approached me and suggested we put the essays together, with introductions to various sections, and that became *More Than You Know*. That's the long intellectual journey behind it, but that's what inspired me to do it in the first place. A lot of it is this idea that we are better people if we think about lots of different disciplines.

Mihaljevic: The book covers a lot of ground and does that masterfully. You organized it into four sections: investment philosophy; psychology; innovation and competitive strategy; and finally, science and complexity theory. To start on the investment philosophy side, you draw a distinction between profession and business when it comes to investing. What do you mean by that?

Mauboussin: This is an important point. This was inspired by an essay written by Charley Ellis in 2001. The argument is if you think about investing, there are two components. The profession component is all about generating excess returns for your investors. Presumably, as a leader of an organization or a portfolio manager, you are invested in that yourself. The key to the profession is it has a certain cadence. In most cases, you want to take the long view. You want to be, as Buffett would

say, fearful when others are greedy and greedy when others are fearful. In a sense, you're working counter to the broad world.

The business of investing is ultimately just like any other business, which is revenues and costs. The business of investing would presume that your business is better if you gather more assets, so the business side is about gathering assets.

You certainly need a good business to support a profession — you need to be able to compensate people, hire the right people, and have the right organization and resources, for example, to do your research in a quality fashion, but the argument that Ellis made, to which I was sympathetic, was that a lot of investment organizations had tilted more toward the business side than the profession side. (By the way, the other person who wrote elegantly about this was Jack Bogle.) For example, if a particular asset class or a particular product is hot, it is the investment organization's focus on the business that will launch products in that area because they're satiating a demand, whereas an organization focused on the profession might say, "We're not going to do that because we think that the prospective returns are not very attractive," and may even go a step further and say, "The products we want to launch are going to be in areas that are ignored today but where we think we can plant seeds that will bear fruit down the road." As I said, a good business is important to a good profession, but it's about what becomes the most important thing as an organization.

I'll tell you a side story about a conversation that I had with Wally Weitz who's a great investor based in Omaha. I think he won't mind that I mention this. Wally's got a great track record and has built a nice business for himself. He said to me one day, "You know, I think to myself, if I really wanted to crank this thing, if I really wanted to grow my business rapidly, there would be ways for me to do this in certain distribution channels, but every time I think about it, I look at the plan and then I put it back in my drawer and close it and say we're really here to methodically deliver excess returns." I thought that was a great example of someone who overtly thought about this profession versus business thing and came down on the side of the profession, which is great.

Mihaljevic: What parallels would you draw between investing as a profession and sports as a profession?

Mauboussin: I think there are a lot of parallels, and I'd even go beyond sports. When you say sports, I don't know if you mean sports team management, like GMs or–

Mihaljevic: I'm referring more to top athletes and how they approach their craft.

Mauboussin: This is not in the book, but I've always been enamored with this concept of athletes. In sports, we have physical athletes. In our business, they're not physical athletes, but they're mental athletes. What does a physical athlete have to do to be at his or her peak performance? You want to have an appropriate training program — deliberate practice, operating at the limit of your performance, things that are relevant in the context of the game you play. The other side of it is you want to make sure you're doing other things properly, for example, rest, nutrition, sleep. These are essential ingredients to performing well as a physical athlete. As a mental athlete — as an investor — what do you want to do? Incidentally, those other things — rest, sleep and nutrition — are also important for an investor. I'm on a big kick on sleep. I think sleep is vastly underestimated. You can get an important cognitive boost just by sleeping the appropriate amount and making sure that's built into your routine.

Training for me would be mostly reading. We'll call it learning in general, but mostly reading. Many of the great investors that I've been around — and I've had the fortune to be around a lot of great investors — spend a lot of their days just reading and thinking. What's interesting about that is there's

no expectation for an immediate payoff. You're not reading something in order to do something specific. You're reading to gather and build your knowledge base so that when an opportunity presents itself, you're in a position to take advantage of it because you've prepared your mind, just like an athlete has prepared him or herself for a particular situation.

For example, people are surprised when someone sends a business proposal to Warren Buffett and he acts on it in fairly short order, and they wonder how he could understand it so quickly. The answer is that he's preparing every single day. He's made a career of preparing himself for these kinds of situations so when they appear, he knows what to do with them quickly. I think there are a lot of parallels between those things. A lot of it boils down to the simple concept of preparation, but other components like rest and time away and sleep are also essential to being a successful mental athlete just as you want to be a successful physical athlete.

Mihaljevic: I'm glad you mentioned sleep, because it's a bit of a contrarian view these days, it seems. We read so much about successful entrepreneurs waking up at all hours of the night and squeezing the last minute out of sleep as it were. It sounds like you come down on the side of not trying to economize too much when it comes to sleep.

Mauboussin: There's a wonderful book by Matthew Walker called Why We Sleep. Before reading it, I thought I knew the overall story, and I had the basic idea, but that book is not only fascinating, being grounded in science, but also compelling. I found myself talking about it with everyone I encountered. There's a lot of research that demonstrates that a deficiency of sleep will impede your cognitive performance — that's learning and memory, et cetera. There are certain extreme times when you may not be able to get the sleep that you hope for, but for most of us, in our day-to-day routine, there is no excuse for not getting the appropriate amount of sleep.

Mihaljevic: Tell us about the Babe Ruth effect, please.

Mauboussin: The background story on this is that I knew a money manager who was in charge of the funds for a particular state pension. They got a new treasurer who went through all the money managers and looked at what percent of their investments beat the market, and he fired the ones that were at the bottom, save one, which was the guy I knew. This one manager had a preponderance of investments that did not beat the market, but his overall portfolio did much better than the market.

On Wall Street, you will often hear people say things like, "You know, if I can be right 53% of the time, I'm going to be great. I'll make lots of money." That statement is accurate in the context of trading. If you're trading all day and you're slightly more right than you're wrong, you'll do fine. The Babe Ruth effect says that the frequency of correctness doesn't matter. It's how much money you make when you're right — it's the magnitude — that matters. It is often the case that even great money managers are wrong a majority of the time on their investments. They lose money most of the time, but when they make money , they make so much that it compensates for those losses and then some. One example is George Soros. One of his colleagues reported that Soros made money on 30% or less of his trades, but of course, the guy is a multibillionaire.

Why did I call it the Babe Ruth effect? When Babe Ruth retired, he had the all-time record for homeruns, but he also had the all-time record for strikeouts. The magnitude of his homeruns more than compensated for the strikeouts that he had over time. That's the big lesson. It's not the frequency of correctness that matters. It's the magnitude. It's how much money you make when you're right versus how much money you lose when you're wrong.

I'll mention one other interesting thing. There is a trading strategy called trend following, which has a formulaic approach. If you look at the payoffs of trend followers, what you find is that they lose money

on a majority of trades, but they have a right-tailed payoff that allows this strategy to be fruitful overall. That's the Babe Ruth effect.

Mihaljevic: Tell us a little about how you think about expertise and experts.

Mauboussin: This is a hot topic. In particular, there's a back and forth between Danny Kahneman, the eminent psychologist who won the Nobel Prize in Economics in 2002, and Gary Klein, who's an outstanding social psychologist and a very interesting guy in his own right. Gary's argument was a lot about what's called naturalistic decision-making: you put people in certain environments and they very quickly solve problems. He talked about firefighters and emergency healthcare providers and so forth. The question becomes what is expertise and how does it work.

The way I would come down on this is expertise or intuition tends to work when you've trained yourself thoroughly in a stable and linear environment. The canonical example would be chess, but you could think of people such as expert drivers or even athletes or soldiers, who are trained in a specific set of environments that are sufficiently stable and linear that their actions always lead to the right outcomes. That's where things like expertise truly can develop. If you introduce non-linear environments or unstable environments, it's difficult to achieve so-called expertise.

This experience and expertise idea is important because there are often industries where people have lots of experience, but they don't really have expertise. Experts are much less prevalent than people tend to think. Expertise tends to work in fairly narrow domains, and we can sketch out what those domains look like.

Mihaljevic: Does it make sense to think about expertise also in terms of what a machine could emulate versus what human experts are uniquely capable of doing?

Mauboussin: If you are doing something that can be written down in a formula that is applied consistently, then a machine would likely be able to do your job. If you think about chess and Go, these games are computationally very difficult, so they lend themselves to machine power. But the rules are changing, for example, in chess, instead of us having an 8×8 board, if we change it to 12×12, and change the way the pieces move, there would be no machine that could beat it. There would be no humans that would be good at it either, but it would take a long time for the machines to be able to beat humans in that. If you can write down the rules and everything is bounded fairly well, machines are going to do well. That's not general intelligence, to state the obvious. Those are machines that are developed to do specific tasks. This relates to how we can use machines or technology to help us in the world of investing, which is a hot and fascinating area. A lot of the applications are not that easy because markets themselves tend to be unstable and non-stationary, so it's difficult to extrapolate the past into the future.

Mihaljevic: Let's shift gears a bit to the psychology of investing. Why did you give it such prominence in the book, and what do you think is the crux of that topic?

Mauboussin: I'll mention a couple of things. One is I think I opened the introduction to that section with a quote from Puggy Pearson, who himself was a colorful gambler, and he had this line which was awesome. He said, "Ain't only three things to gambling: knowing the 60-40 end of a proposition, money management and knowing yourself." That pretty much encapsulates almost everything we need to know about investing, and the knowing yourself part is important. The point of emphasis in that section was how do we think about collective behavior, which we find all around us, but certainly is important in the context of markets.

I want to come back to that in a second, but there's a chapter in there that's a bit controversial, called

something like “Beware of Behavioral Finance.” This is an important argument for people to take into consideration. A lot of the literature on behavioral finance deals with individual mistakes that you and I make. We tend to be overconfident. We tend to fall for anchoring, reframing, loss aversion. These are all things that we could demonstrate in a laboratory or in the classroom, and are certainly real, but it’s important to distinguish between those behaviors and what we actually see in markets, because markets are collectives. They’re people interacting with one another. The nature of collective behavior is different from individual behavior. Some people simply argue that humans are not rational, and since markets are made up of humans, that means markets are not rational. My argument is that the last thing doesn’t follow from the first two. The aggregation of even suboptimal individuals can lead to optimal results. Part of the point is that we’re not really talking about psychology when we think about markets. We’re talking about sociology, which is how groups behave in a group setting.

That was one of the big things I wanted to emphasize in that section, which was almost like a psychological or sociological approach to how to think about markets. It’s often left out in much of our discussions. If you study finance formally in the classroom, we typically start with simple models of rational agents and optimal behaviors and so forth, and you depart from that in terms of the real world. My point of emphasis is that this idea of psychology of investing and understanding how collectives operate is incredibly important to understanding how markets work, and ultimately, the ability to generate excess returns if that’s your objective.

Mihaljevic: How do you look at that in terms of the market at different points, meaning the aggregation of individual humans in normal times, let’s say, versus at points of extreme market stress?

Mauboussin: The basic idea would be that markets tend to be efficient, and we’ll call it the wisdom of crowds. The wisdom of crowds is operative when three conditions are in place. Firstly, the underlying agents — in this case, investors — come to the market with diverse points of view. Some people are optimistic, some are pessimistic. There are technical traders, fundamental traders, short term, long term, etc. The second condition is that there’s a properly functioning aggregation mechanism. The information that is out in the world is reflected, in this case in particular, in prices. Exchanges do that very well, but I would note that sometimes aggregation falls down because people simply do not participate. The third is incentives, which are rewards for being right and penalties for being wrong. The argument [inaudible 00:28:35] to support this, is that when those three conditions are operative, you get an efficient market, even when the underlying agents have limitations themselves. A trivial example is the jellybean jar example, where if you have a jar of jellybeans and you pass it around to a group of people and ask them how many beans are in the jar, the individual guesses are usually not that good, but if you aggregate the guesses, you get an extremely accurate answer. Again, no individual is particularly good at it, but collectively, they’re extremely good at it.

The flipside of that is when the markets become interesting, and that is when one or more of those conditions are violated. By far, the most likely to be violated is diversity. Rather than each of us operating independently or with our own views, we correlate our behaviors. Humans are social, and investing is inherently a social exercise, so from time to time, it happens that people’s views collapse upon one another, and people all start to believe the same thing. By the way, even if you take an extreme example, such as the dot com bubble in the late 1990s through 2000s, not only were there a lot of enthusiasts buying these types of companies, but there were also a lot of naysayers who did not believe the values were appropriate, but they simply sat on their hands. They sat out. They didn’t do anything to change that narrative. They didn’t inject some diversity into the markets, which is tantamount to allowing that particular diversity breakdown to continue.

There’s a line I love from Seth Klarman at Baupost, where he says value investing is, at its core, the marriage of a contrarian streak and a calculator. The contrarian streak says when others are bullish or bearish, examine the other side of the case. That need not be a simple way to make money, because

sometimes the consensus is correct, and by the way, positive feedback is something that we see a lot in nature in order to survive. So it's not just being contrarian — the second component is essential, and that's the calculator. Because everyone is uniformly bullish or uniformly bearish, that's led us to a set of expectations that are unduly high or unduly low, and that company or that industry simply cannot satisfy that set of expectations that's priced into that particular stock. As a consequence, there's going to be a reversal. To me, that's the package: let's think about market efficiency, let's use this wisdom of crowds framework and the conditions, and then introduce the Klarman thing which is this contrarian streak plus a calculator. It seems like everybody has a uniform point of view, which seems to be what's expressed in the security price, and through an expectations approach, I'm going to reverse engineer and say it's a good bet to be on the other side of the argument.

Mihaljevic: Shifting to part three of the book, innovation and competitive strategy, what do you mean when you say that creative destruction is here to stay?

Mauboussin: Paul Romer recently won the Nobel Prize in Economics for his work on exogenous growth theory. What I learned from Romer's work is that innovation essentially is the recombination of building blocks. You could think about certain chunks of ideas or technologies as building blocks, and by recombining them, we can solve problems in the future. The degree to which we have more building blocks available at our disposal, and we have tools to manipulate that, such as computing power, that means we should not only have steady rates of innovation, but even potentially exploding rates of innovation. That, to me, is this argument on creative destruction or innovation: because the building blocks are there, we are going to continue to see innovation. There may be complicating features, such as policy or regulation or things like that, that may accelerate or stall the rate of innovation, but the core idea that Romer laid out in terms of exogenous growth is a powerful construct. That was the argument I was trying to make.

Mihaljevic: Perhaps more generally, how do you think about the impact of innovation — in particular what we're seeing today in terms of disruption across industries from technology-driven innovation —on the sustainability of competitive advantage?

Mauboussin: This is a tricky one. I think there's a bit of an arm wrestle going on between two sides of this argument. The first side, which has been the argument of impeding innovation, speaks mostly from the point of view of the United States, although to a degree it's relevant in other markets as well. In the United States, certainly in the last 20 or 25 years, we've seen a substantial consolidation of industries. If we look at the Herfindahl Index, which is a measure of industry concentration, it has been going up, which means industries are becoming more concentrated. Most of that is a consequence of mergers and acquisitions. In the United States, the Justice Department and FTC allow companies to merge. With fewer participants, that is likely to lead to easier coordination on pricing, etc.

Many would argue that to some degree, that has blunted innovation. I alluded to this a moment ago, but to reiterate, things like regulation, which are meant to control the behaviors of incumbents, often can become a barrier to competitors. Regulatory adherence can sometimes be a cost that's too onerous for an upstart to deal with. Financial services is an area where that's a consideration — think about the amount of money that the large banks, certainly in the States but also elsewhere, spend on compliance. It's a difficult thing to tackle.

On the other hand, it's what I mentioned a moment ago, which is the recombination or putting together of technologies in a way that is fairly novel and that should lead to new solutions to problems. Amazon.com is a good example. At the time it came along, it was able to tap into things like the internet, obviously, but also a distribution system in the form of the postal service or UPS, different types of software, technology for warehouses, and so forth. These things all came together in a way

that would clearly have not been possible 10, 15 or 20 years before. I think that kind of theme is going to continue as well: what resources do we have at our disposal.

To answer your question more specifically — and this is an ongoing thread of research in terms of thinking about competitive advantage — there are some thoughtful papers (the main ones are by Wiggins and Ruefli) on the argument that competitive advantage has been shrinking. You measure that specifically by looking at excess returns, so excess rents that are being earned, but it is difficult to measure. We can certainly look at the past, but it's difficult to look at things today. My own sense is it's difficult for certain companies to stay on top. On the flipside, if you look at, for example, margins of businesses, what we're seeing is that in the top 20% — the top quintile, or really, the top decile — certain types of businesses are very strong, and you think about certain businesses that have strong network effects. It's not super clear how those network effects will be eroded by competition.

The long and short of it is I don't really know. I do think as an investor, when you buy any particular stock, you should think about what kind of competitive advantage you're paying for, and whether that's plausible given a thoughtful and thorough competitive strategy analysis. To come up with a concrete judgment for any particular company or industry or sector is a tricky task.

Mihaljevic: In the book, you ask the question, "Is there a fly in your portfolio?" Tell us about the metaphor of fruit flies.

Mauboussin: That's related to the question you just posed. The metaphor there was about this fly called Drosophila, which is a particular type of fly which geneticists have studied because they reproduce quickly. You get lots of generations that happen, so you can analyze how various things happen. It's almost like it speeds up the world. The question I thought about or mused about out loud — and there are certain academics who certainly hold this view — is whether we're simply speeding up. The world is speeding up and we're becoming more a world of Drosophila, where things are happening faster and faster. There's a professor, Charles Fine, who has done work on certain cycles of speed for various industries and makes the claim that the clock speed has been accelerating. That is the basic argument.

These are all things that investors should take into consideration when they're looking at a particular company or product. What is the likely life of this product? How do I think about that? What could unseat it? Certain companies have to create new products rapidly even if it's in the same business. Think about the evolution, for example, of disk drives, where product lives are short and you have to have a new product behind the old one in order to continue your competitive positioning. That's the idea behind the Drosophila.

Mihaljevic: Is there a link there at all to profit margins which have been, I guess, near historical highs? How do you think about reversion to mean there in light of innovation?

Mauboussin: We published a piece a few years ago called "The Base Rate Book" — if you search for The Base Rate Book and Michael Mauboussin, you'll probably find it. We looked at a fairly large sweep of history of corporate performance back to, in many cases, the 1950s, but in most cases, certainly the 1980s. We analyzed the base rate of corporate performance, and one of the chapters is specifically on operating margins. In that piece, by the way, the opening section talks a lot about almost precisely the question you're posing about how we think about regression toward the mean and the rapidity with which that happens.

I'll state something that, on reflection, is a fairly obvious comment, which is if you go through the P&L — so you go through sales and gross profits and operating income or operating margins down to net income — there are varying degrees of persistence. Or saying the opposite, the regression toward the

mean happens at different rates for each of those different things. In particular, I'll shine a spotlight on the question you've posed about operating margins. We analyzed operating margins back to 1950. It's a large sample — a little over 1,000 companies — and we found something interesting. First of all, operating margins are actually not a rapidly mean-reverting series. Some people say that margins are inevitably going to revert to the mean, but that's empirically not correct. That is not a rapidly mean-reverting series. Perhaps a more consequential observation is if you look at margins over time and break it into quintiles, so five different bins, you find that in the bottom three bins, the margins move up and down with the economic cycle, but I'm going to call those roughly dissimilar to the past. The top two quintiles, and in particular the top quintile has the one that's really run away from the pack. It's gotten much, much higher. That becomes an interesting question as to why those margins have gone up so much.

A lot of people — and I'm sympathetic to this argument — have argued that's a consequence of many of these winner-take-all, network-effect type of businesses, and also capital-light businesses, so businesses where intellectual property tends to be at the core versus physical assets, that allows for a lot of scalability, and hence, high incremental profit margins. When we talk about margins and regression toward the mean, it's a much more nuanced argument. You need to unpack it a bit and say what are we talking about in terms of where you are, in terms of the ranking, in terms of the operating margins, and ask the question as to what is underpinning those high margins and is that likely to be something that changes in the next few years. I hear the mumblings about margins being as high as they are, and I don't have a strong view on this, but I'm certain that it's not a clean story, where you can simply say they're too high and they have to go lower. You need to parse that in some detail and really think about the different components to come up with a thoughtful point of view.

Mihaljevic: Before we wrap up, perhaps we can touch briefly on part four as well. How do you think about complexity theory in terms of its use in investing, and what do you think are the biggest hurdles that remain in that theory to actually applying it day to day?

Mauboussin: In terms of my own education or evolutionary process and understanding how markets work, I probably started — as many people did — in the University of Chicago "markets are efficient" camp. For many people, the default of market efficiency is probably not a bad place to default. In other words, if you have no view, just assuming the market is smarter than you and their prices are pretty good reflections of value, is not a crazy place to start. What the Santa Fe Institute introduced into my thinking and into my language, is something I alluded to before, which is this idea of markets as complex adaptive systems. I mentioned the concept of the wisdom of crowds. These concepts are somewhat interchangeable, but recognizing markets as complex adaptive systems opens up a whole new way of thinking, and a whole new set of tools. We know that markets are hard to beat, and also that markets periodically go haywire. How do you put those two things under the same tent? The complex adaptive systems approach does that. Specifically — just to reiterate — the conditions for efficiency, and diversity, and aggregation, and incentives are a good way to think about that.

This was an automatic entree into discussions about things like fat tails. Nassim Taleb wrote a book in 2001 called Fooled by Randomness, which introduced the world to understanding the role of luck in things. That was great, but he probably made a bigger splash with The Black Swan, which talked about this notion of fat-tail or unusual events. Related to that is this notion of non-linearity. A lot of functions in the world are not linear, which almost always creates surprise for individuals. I would put that under the science and complexity thing, which is really interesting.

Where do we have to go on this? I mentioned diversity breakdowns, but how do we measure that? Is there a way for us to do this in an effective fashion? That's an exciting area. There's work on things like crowdedness, which is a first-order way of thinking about that, but can we develop a richer theory for that? We have some insights about that from things like agent-based models, where we create a

market ecosystem in a computer and we let agents trade with one another, but that's just the first step. That's an area we could develop further.

The other thing I'll mention is something that's discussed in Didier Sornette's fascinating book called Why Stock Markets Crash. I don't think it's mentioned in my book because Sornette's book came out after mine. Are there statistical signatures or precursors in markets, as there may be in other systems, that would allow us to increase the probability of anticipating some sort of market break? Those are exciting areas of potential research.

Mihaljevic: If you'll allow me to move beyond the book a bit, I'd love to hear about your writing process. You've been so prolific and have delivered so much wisdom for all of us to consume. What is your process?

Mauboussin: I wish I had a good answer for this question. I'll just mention a couple of things. I mentioned at the outset of our conversation that I'm someone who's reading and thinking and watching and almost having a dialogue with this content. Part of this is figuring out what are interesting topics to talk about. For example, Measuring the Moat came about because we were doing a lot of work trying to create a framework for understanding sustainable competitive advantage. I, like many others, had read widely on this, from Michael Porter to Clay Christensen and others, but I hadn't seen the information organized in a cohesive fashion. Measuring the Moat was my attempt to organize all that information, which was a difficult process for me. It was an attempt to synthesize a lot of different things.

I read Will Thorndike's book The Outsiders, about capital allocation, which came out in 2012, I believe. It's a wonderful book and Will's a great guy. He selected I think eight CEOs and showed how those CEOs were super efficient capital allocators. Many of them came from backgrounds that were atypical for executives. That was cool and inspiring, but it led me to thinking, I don't really know how thousands of companies have spent their money. So we spent a lot of time on capital allocation, looking at the top 1,000 companies in the United States. We looked at how they spent every dollar back to 1980. That's a huge project.

That's the first thing: finding interesting topics to write about. There's no dearth of things to write about today. There are a lot of interesting themes that people talk about in bits and pieces but haven't put together in a cohesive fashion.

The second thing I'll mention in terms of my workflow, is I learned a lot from an editor named Laurence Gonzales with whom I worked on the last two books, Think Twice and The Success Equation. Laurence is a dear friend. He's a Miller Scholar at the Santa Fe Institute, but is basically a writer and a journalist. He has a fascinating personal background, with lots of varied experiences. When I gave Laurence some of my books to edit, he not only edited them, but he also taught me a lot about writing. In the last 10 or 12 years, I've probably learned more about writing than I've learned my whole life, and a lot of that is through the instruction of a very talented guy like Laurence.

I'll also mention Steven Pinker, who's known primarily as a psychologist, but he also wrote a book about style — how to write. Chapter three of that book, in particular, is incredibly powerful for helping people understand how to write effectively, and how to be concrete, and how to make visions solid for the reader. I try to think, as someone who's trying to communicate effectively, what have I learned to do, and who have I turned to to help me become more effective at that?

The last thing I'll mention is we spend a lot of time — probably too much time — on visualization. I spend a lot of time thinking about and studying data visualization, trying to make sure that whatever exhibits we share in our work are things that can stand on their own, they're clear, and they

contribute to the overall discussion.

I wish I had a better answer. It's funny you say that I'm productive. I often feel like I'm not productive because my idea generation is faster than my output. Even when I was writing "The Consilient Observer", the backbone for *More Than You Know*, I had a running list of things I wanted to write about. There's a never-ending list of things to work on. We're blessed to be in an industry that's so fascinating, that has non-stop learning. The world is constantly changing. There are lots of puzzles for us to solve. I think I mentioned this at the conclusion of *More Than You Know*, that I tell my students on the first day of class: I'm going to guide a course, but at the end of the day, there are a lot more questions than answers. Part of the joy, part of the fun, part of the goal is for us to explore those questions and try to get a little closer to the truth and to understand it.

Mihaljevic: Michael, this has been terrific. Thank you so much for taking the time. It's always such a privilege and a pleasure.

About the book:

Since its first publication, Michael J. Mauboussin's popular guide to wise investing has been translated into eight languages and has been named best business book by *BusinessWeek* and best economics book by *Strategy+Business*. Now updated to reflect current research and expanded to include new chapters on investment philosophy, psychology, and strategy and science as they pertain to money management, this volume is more than ever the best chance to know more than the average investor.

Offering invaluable tools to better understand the concepts of choice and risk, More Than You Know is a unique blend of practical advice and sound theory, sampling from a wide variety of sources and disciplines. Mauboussin builds on the ideas of visionaries, including Warren Buffett and E. O. Wilson, but also finds wisdom in a broad and deep range of fields, such as casino gambling, horse racing, psychology, and evolutionary biology. He analyzes the strategies of poker experts David Sklansky and Puggy Pearson and pinpoints parallels between mate selection in guppies and stock market booms. For this edition, Mauboussin includes fresh thoughts on human cognition, management assessment, game theory, the role of intuition, and the mechanisms driving the market's mood swings, and explains what these topics tell us about smart investing.

More Than You Know is written with the professional investor in mind but extends far beyond the world of economics and finance. Mauboussin groups his essays into four parts — Investment Philosophy, Psychology of Investing, Innovation and Competitive Strategy, and Science and Complexity Theory — and he includes substantial references for further reading. A true eye-opener, *More Than You Know* shows how a multidisciplinary approach that pays close attention to process and the psychology of decision making offers the best chance for long-term financial results.