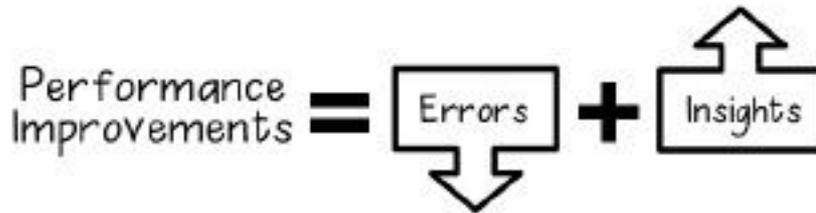


Gary Klein's excellent new book, "[Seeing What Others Don't: The Remarkable Ways We Gain Insights](#)" starts with a neat looking equation:



In other words, if you have to get better at anything, you must do two things:

1. Don't screw up
2. Get cool ideas that work

In BFBV, hopefully you'll learn both these skills.

But before we get to all of that, I want to talk a bit about two psychologists — Klein and Kahneman who, it seems to me, really don't like each other. I, on the other hand, love both.

Klein vs. Kahneman

In his masterpiece, "[Thinking, Fast and Slow](#)," Daniel Kahneman refers to Klein as an

“adversarial collaborator, the intellectual leader of an association of scholars and practitioners who do not like the kind of work I do. They ... adamantly reject the focus on biases in the heuristics and biases approach. They criticize this model as overly concerned with failures and driven by artificial experiments rather than by the study of real people doing things that matter. They are deeply skeptical about the value of using rigid algorithms to replace human judgment, and ... Gary Klein has eloquently articulated this position over many years. This is hardly the basis for a beautiful friendship...”

Klein, on the other hand, has this to say about Kahneman:

“In his recent bestseller Thinking, Fast and Slow, Kahneman distinguishes between fast and intuitive System 1 thinking and System 2 thinking, which is slower, more

critical, analytical, and deliberate... These ideas line up nicely with the two arrows in the performance diagram I presented. System 2 is all about the downward arrow. It is all about reducing errors. The weight of the heuristics-and-biases studies, reporting bias after bias, can unsettle us, making us doubt our own judgments, our capacity for clear thinking. Frequently, the message of the heuristics-and-biases research is that we are likely to draw mistaken conclusions unless we engage in rigorous critical thinking. The message is that we have to strengthen the down arrow. I believe it is important to counterbalance this negative impression of System 1 with a sense of awe and appreciation about the insights we create and the discoveries we make. We need both arrows, just as we need both System 1 thinking and System 2 thinking. The process of gaining insights, the upward arrow, balances the worries about decision biases, the downward arrow.”

“The judgment and decision making community for the past few decades has concentrated on heuristics and biases, particularly the ways our heuristics can get us in trouble. Thus, the force of seeing connections, coincidences, and curiosities can take us too far, to the point where we see connections that aren’t there. Scientists refer to these false connections as “pseudo-correlations,” connections that aren’t valid, and warn us about them. However, these warnings miss all that we learn by noticing connections. The warning is an example of down-arrow thinking, just worrying about the cost of a mental habit without appreciating its benefits. The heuristics-and-biases community has provided us with a stream of studies showing how our mental habits can be used against us and make us look stupid and irrational. They don’t offer a balanced set of studies of how these habits enable us to make discoveries.”

You know what? We’ll let them fight over this.

In the meantime, we will learn not to screw up by identifying, with Kahneman’s help, various ways in which people screw up (biases) and then finding antidotes to protect us from those biases.

Loss Aversion

Here’s an example of a bias we will study about in more detail in a week or so. Choose between:

- A. An 85% chance of winning \$100 (the gamble); or
- B. A sure gain of \$85 (the sure thing)

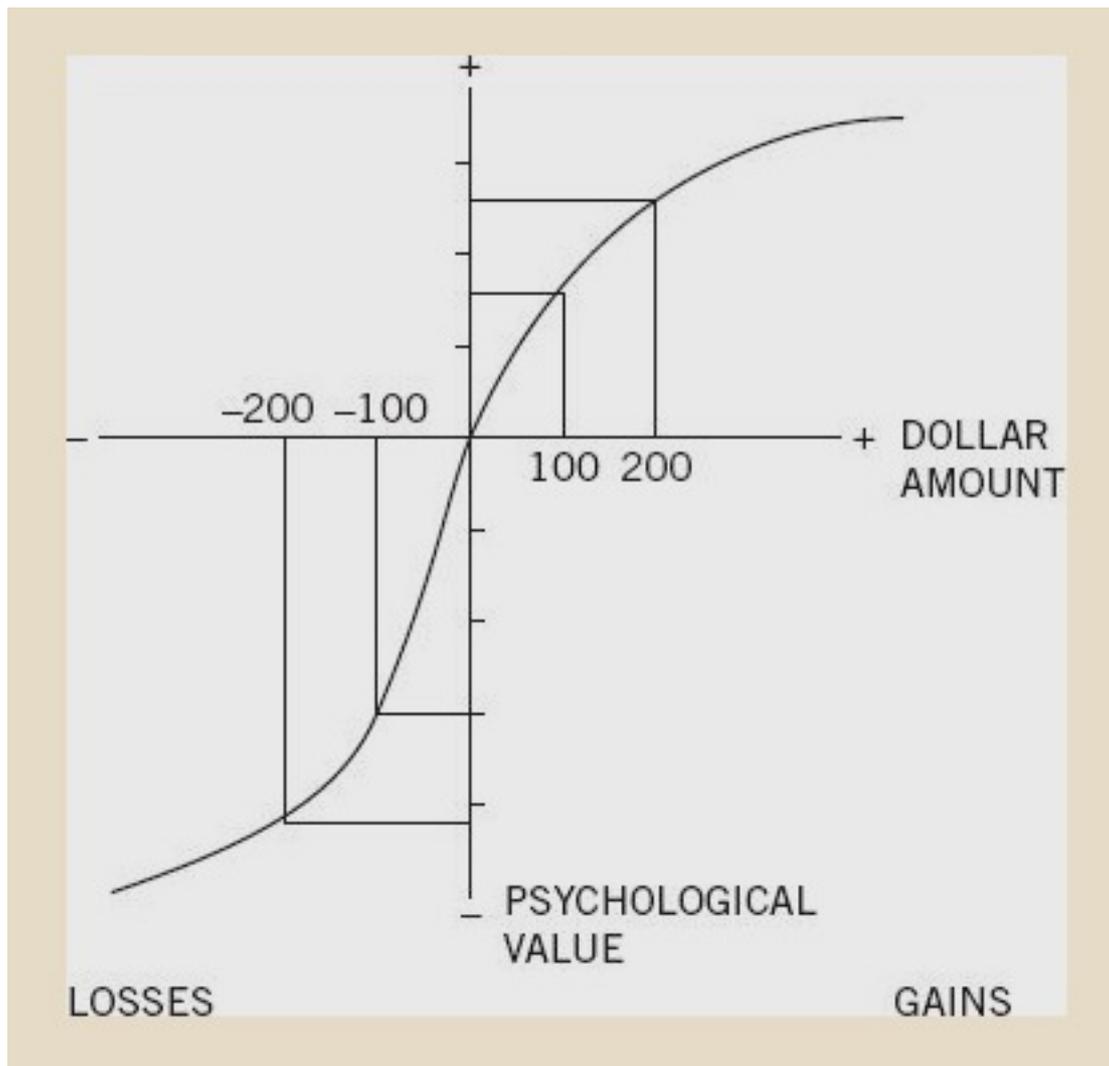
Most people when given these choices, pick B because they think of themselves as conservative and after all a bird in hand is worth two in the bush, right? So why gamble?

But, now see what happens when the same people are asked to choose between:

- A. An 85% chance of losing \$100 (the gamble); or
- B. A sure loss of \$85 (the sure thing)

Almost everyone now switches from the sure thing to the gamble because they hate taking losses. Notice what just happened here. Just by changing a few words, you can turn people from conservative to gamblers.

It turns out, as Kahneman and Tversky pointed out, that the quantity of a man's pleasure from a \$100 gain does not exactly match the quantity of the misery from a \$100 loss as the chart below shows.



Losses loom larger than gains and people go to extremes to avoid them. This loss aversion results in dumb behaviour like averaging down in situations like Financial Technologies instead of taking a loss. Loss aversion makes us hold on to things, long after they have become toxic, because we hate losing them. (Now, if your mind is thinking whether this lesson applies to just toxic *things* or to toxic *people* too, then maybe you're getting the point that BFBV goes beyond just learning about businesses and investing. It's a course about life...)

These type of monumental screw ups (about 20 of them) are certainly avoidable, at least up to a point.. Avoiding them completely won't be easy, however, for reasons we will soon discover. You'll never become perfectly rational like Mr. Spock.

Becoming Spock



In fact, that's not even desirable for me to turn you into Mr. Spocks. I wouldn't want you to become perfectly rational and emotionless like him, even if that will make you very rich, because that will also make you less humane. Besides, how will I ever explain it to your parents as to why I turned you into a Vulcan?

I think its OK to have a little bit of imperfection in life and I agree with Klein who cautions us not to fall for the "perfection trap." He writes:

"Organisations have lots of reasons to dislike errors: they can pose severe safety risks, they disrupt coordination, they lead to waste, they reduce the chance for project success, they erode the culture, and they can result in lawsuits and bad publicity...In your job as a manager, you find yourself spending most of your time flagging and correcting errors. You are continually checking to see if workers meet their performance standards. If you find deviations, you quickly respond to get everything back on track. It's much easier and less frustrating to manage by reducing errors than to try to boost insights. You know how to spot errors. You don't know how to encourage insights other than hanging inspirational posters on the walls..."

However, insights can take us beyond perfection. They can show us ways to improve on the original plan. Why would we lock ourselves into the initial objective when we can build on discoveries?

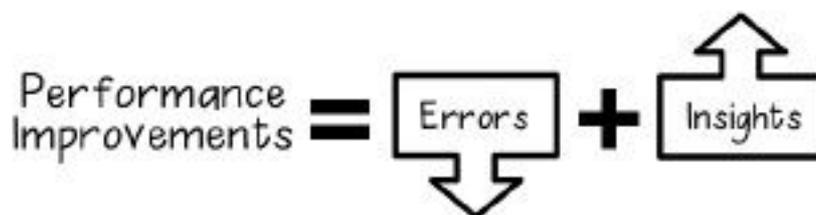
Serendipity as an Escape from The Perfection Trap

Arlene Goldbard, a blogger, talks about accidental discoveries in science while reviewing Nassim Taleb's monumental book titled "The Black Swan"

"I love what Taleb has to say about inventions, how almost all of the discoveries that have had tremendous impact on our culture were accidents in the sense that they were discovered while searching for something else. Because of hindsight bias, he says, histories of economic life and scientific discoveries are written with straightforward story lines: someone set out to do something and succeeded, it's all about intention and design. But in truth, "most of what people were looking for, they did not find. Most of what they found they were not looking for. Penicillin was just some mold inhibiting the growth of another lab culture; lasers at first had no application but were thought to be useful as a form of radar; the Internet was conceived as a military network; and despite massive National Cancer Institute-funded cancer research, the most potent treatment — chemotherapy — was discovered as a side-effect of mustard gas in warfare (people who were exposed to it had very low white blood cell counts). Look at today's biggest medical moneymakers: Viagra was devised to treat heart disease and high blood pressure."

I think you'll agree that human civilisation would have been worse off if these and most other scientists, in their desire to achieve "perfection," had decided to stick to the "original plan" and discard unexpected results from their experiments. As Klein writes:

We don't want to be trapped by perfection. To improve performance, we need to reduce errors... and we need to increase insights. Unfortunately, the two arrows often conflict with each other. The actions we take to reduce errors ... can get in the way of insights.



Therefore, organisations are faced with a balancing act. Too often they become imbalanced and overemphasise the down arrow. They care more about reducing errors ... than about making discoveries. They fall into the ... perfection trap."

If not Spock, then Who?



So, I would definitely not want to turn you into Mr. Spock. Then, what other choices do I have? What do I turn you into instead?

How about Sherlock Holmes?



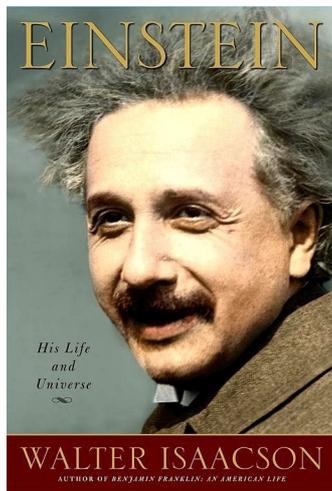
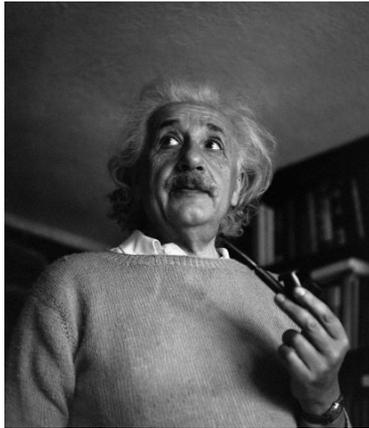
Holmes, like Spock, is a fictional character, but its creator, Arthur Conan Doyle was inspired by a real Dr. Joseph Bell.

Recently, two excellent books were published on Sherlock Holmes' thought process. I recommend them to you. These are "[Mastermind: How to Think Like Sherlock Holmes](#)," by Maria Konnikova and "[A Few Lessons from Sherlock Holmes](#)," by Peter Bevelin.

If you pick up the list of 20-odd standard biases, and then try to locate them within Sherlock Holmes by reading through his detective stories, you are unlikely to be successful. Peter Bevelin's book confirms this point beautifully. Bevelin knows a thing or two about biases. After all, he is the author of the superb book titled "Seeking Wisdom: From Darwin to Munger" in which he outlines Charlie Munger style of thinking. That's a thinking style which you will also discover in BFBV.

I like Holmes as a useful role model for you because he is not paranoid about avoiding mistakes. In fact, he is sometimes quite wrong and ends up on a wrong track. In the end, of course, he solves the mystery by his amazing insights which all of you have read about as kids. Notice, the difference between the perfectionist who only focuses on reducing error to the practical and successful practitioner who has a theory based on fragments of some evidence and is willing to take a chance to gain some insights. The perfectionists rarely get insights because they are too busy eliminating their errors to let their minds wander like that of Einstein's and his famous thought experiments.

Einstein's Thought Experiments



In his definitive [biography](#) of Einstein, Walter Isaacson writes about amazingly insightful mind of Einstein:

“It was at this school that Einstein first engaged in the visualized thought experiment that would help make him the greatest scientific genius of his time: he tried to picture what it would be like to ride alongside a light beam. . . . This type of visualized thought experiments — Gedankenexperiment — became a hallmark of Einstein’s career. Over the years, he would picture in his mind such things as lightning strikes and moving trains, accelerating elevators and falling painters, two-dimensional blind beetles crawling on curved branches, as well as a variety of contraptions designed to pinpoint, at least in theory, the location and velocity of speeding electrons.”

“Once again, he was deducing a theory from principles and postulates, not trying to explain the empirical data that experimental physicists studying cathode rays had begun to gather about the relation of mass to the velocity of particles. Coupling Maxwell’s theory with the relativity theory, he began (not surprisingly) with a thought experiment. He calculated the properties of two light pulses emitted in opposite directions by a body at

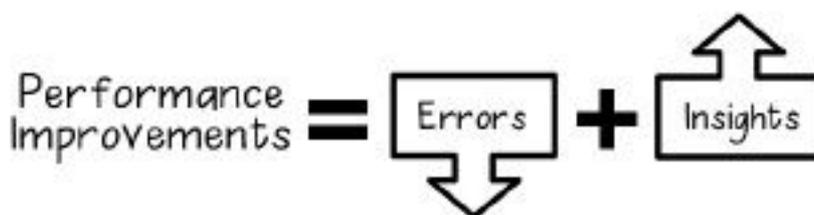
rest. He then calculated the properties of these light pulses when observed from a moving frame of reference. From this he came up with equations regarding the relationship between speed and mass.”

There are 37 occurrences of the term “thought experiment” in this wonderful biography of one of the best minds in humanity and I urge you to read them up in this marvellous book about a genius mind which escaped from the “perfection trap.”

The BMW Story

Klein tells this story:

“Two cops were stuck in traffic, but they didn’t feel impatient. They were on a routine patrol, and not much was going on that morning. The older cop was driving. He’s the one who told me the story, proud of his partner. As they waited for the light to change, the younger cop glanced at the fancy new BMW in front of them. The driver took a long drag on his cigarette, took it out of his mouth, and flicked the ashes onto the upholstery. “Did you see that? He just ashed his car,” the younger cop exclaimed. He couldn’t believe it. “That’s a new car and he just ashed his cigarette in that car.” That was his insight. Who would ash his cigarette in a brand new car? Not the owner of the car. Not a friend who borrowed the car. Possibly a guy who had just stolen the car. As the older cop described it, “We lit him up. Wham! We’re in pursuit, stolen car. Beautiful observation. Genius. I wanted to hug him it was so smart.”



“To improve performance, we need to do two things. The down arrow is what we have to reduce, errors. The up arrow is what we have to increase, insights. Performance improvement depends on doing both of these things. We tend to look for ways to eliminate errors. That’s the down arrow. But if we eliminate all errors we haven’t created any insights. Eliminating errors won’t help us catch a car thief who chooses the wrong moment to flick his ashes.”

Now, *that's* what Sherlock Holmes type of thinking is about. The cop becomes curious. He notices a contradiction that doesn't make sense. He asks some questions. The answers don't make sense. They just don't add up. He then concludes that there is only one possibility left (but he could be wrong!) and he stops the car and it turns out that he was right.



“How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?” - Sherlock Holmes in “The Sign of the Four”

The idea of “proof by contradiction” is not new. You learnt it in school when they taught you how to prove that the square root of 2 is an irrational number. You prove that by first assuming it to be a rational number and then showing that if it was a rational number, it will result in an absurdity! So, that must mean that the square root of 2 is an irrational number

You learnt this trick in school and then you forgot all about it. It's an amazingly powerful trick with multi-disciplinary applications so you've just got to use it almost routinely in the way you think, just like Sherlock Holmes does.

Let me cite four stories illustrating the power of this type of insight.

Story # 1: Buffett on Dotcoms



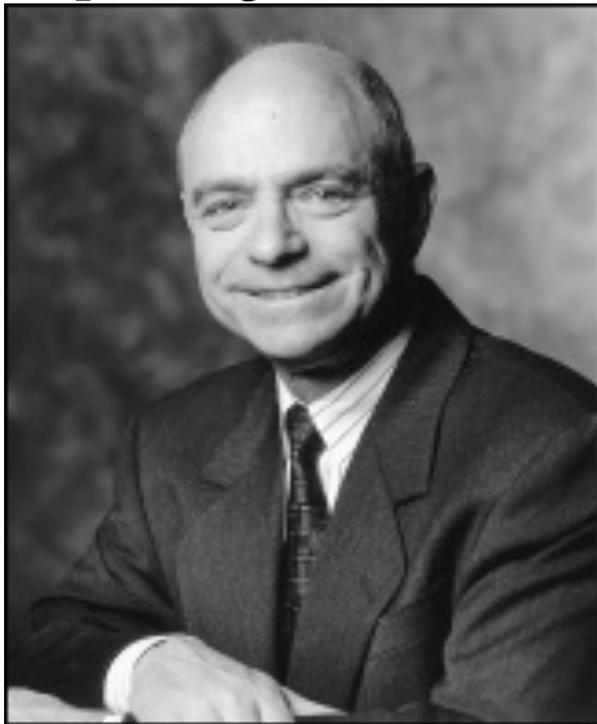
In 2000, Buffett was asked by a Berkshire Hathaway shareholder to explain why he did not buy any internet stock. Recall that at that time, internet stocks were the rage. Buffett, however, had refused to participate in the speculative mania and Berkshire Hathaway's stock price had hugely under-performed stocks of the internet companies. Some media reports even accused him of having "lost it" by not investing in the companies of the future.

Buffett used the tool of "proof by contradiction" to demonstrate the silliness of the market at that time. He said:

"When we buy a stock, we always think in terms of buying the whole enterprise because it enables us to think as businessmen rather than stock speculators. So let's just

take a company that has marvellous prospects, that's paying you nothing now where you buy it at a valuation of \$500 billion. If you feel that 10% is the appropriate return and it pays you nothing this year, but starts to pay you next year, it has to be able to pay you \$55 billion each year – in perpetuity. But if it's not going to pay you anything until the third year, then it has to pay \$60.5 billion each per year – again in perpetuity – to justify the present price... I question sometimes whether people who pay \$500 billion implicitly for a business by paying some price for 100 shares of stock are really thinking of the mathematics that is implicit in what they're doing. For example, let's just assume that there's only going to be a one-year delay before the business starts paying out to you and you want to get a 10% return. "If you paid \$500 billion, then \$55 billion in cash is the amount that it's going to have to disgorge to you year after year after year. To do that, it has to make perhaps \$80 billion, or close to it, pretax. Look around at the universe of businesses in this world and see how many are earning \$80 billion pretax – or \$70 billion or \$60 or \$50 or \$40 or even \$30 billion. You won't find any..."

Ralph Wanger on Disk Drive Industry



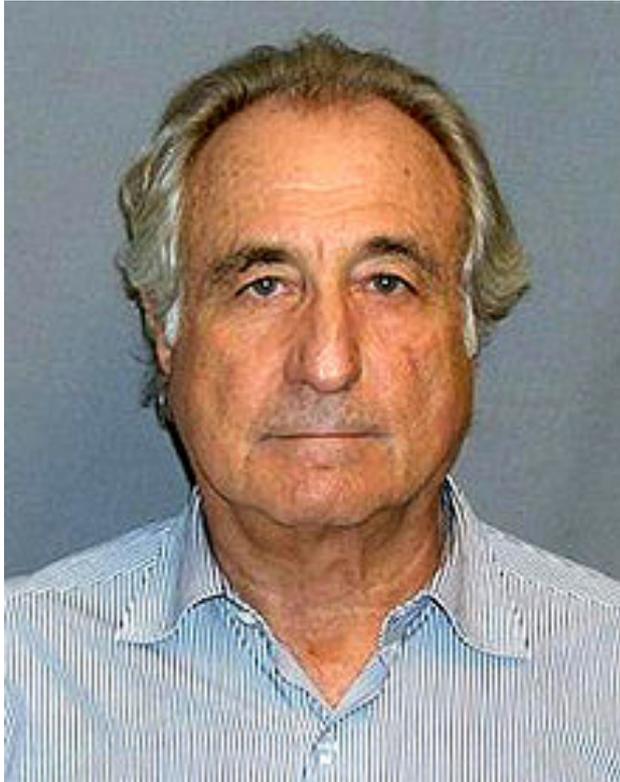
Ralph Wanger, a famous and successful money manager used “proof by contradiction” to demonstrate that the rush to invest in disk drive manufacturing companies in 1980s was a speculative bubble. He wrote this to his shareholders:

“Remember back in the early '80's when the hard disk drive for computers was invented? It was an important, crucial invention, and investors were eager to be part of this technology. More than 70 disk drive companies were formed and their stocks were sold to the public. Each company had to get 20 percent of the market share to survive. For some reason they didn't all do it . . .”

So, you see, smart investors like Buffett and Wanger use elementary concepts like “proof by contradiction” routinely in the way they think. You should too.

Harry Markopolos “Gets” Madoff





See this video:

▶ [The Man Who Knew - YouTube](#)

Harry Markopolos too used “proof by contradiction” to demonstrate that Bernie Madoff was a fraudster.

The World’s Largest Hedge Fund is a Fraud

**November 7, 2005 Submission to the SEC
Madoff Investment Securities, LLC
www.madoff.com**

There are 2 possible scenarios that involve fraud by Madoff Securities:

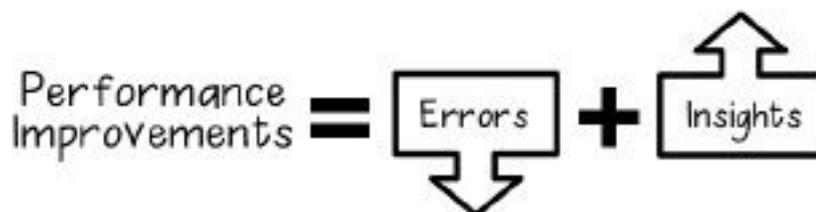
1. Scenario # 1 (**Unlikely**): I am submitting this case under Section 21A(e) of the 1934 Act in the event that the broker-dealer and ECN depicted is actually providing the stated returns to investors but is earning those returns by **front-running** customer order flow. Front-running qualifies as insider-trading since it relies upon material, non-public information that is acted upon for the benefit of one party to the detriment of another party. Section 21A(e) of the 1934 Act allows the SEC to pay up to 10% of the total fines levied for insider-trading. We have obtained approval from the SEC's Office of General Counsel, the Chairman's Office, and the bounty program administrator that the SEC is able and willing to pay Section 21A(e) rewards. This case should qualify if insider-trading is involved.
2. Scenario # 2 (**Highly likely**) Madoff Securities is the world's largest **Ponzi Scheme**. In this case there is no SEC reward payment due the whistle-blower so basically I'm turning this case in because it's the right thing to do. Far better that the SEC is proactive in shutting down a Ponzi Scheme of this size rather than reactive.

Proof by Contradiction



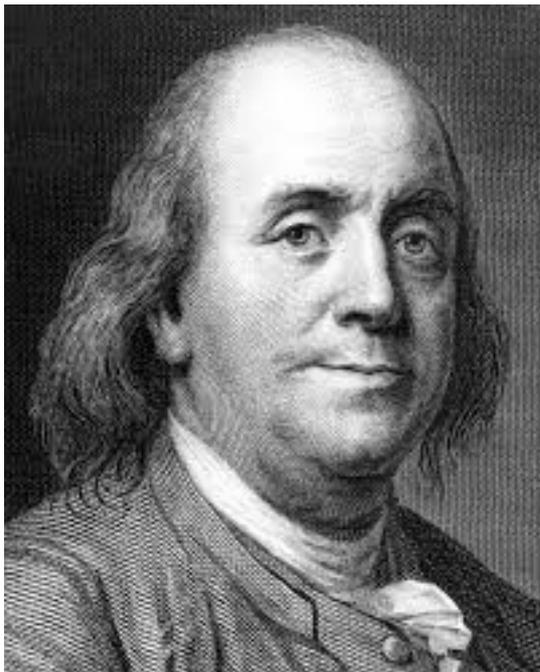
Red Flag # 4: *\$9.017 billion in total OEX listed call options outstanding is not nearly enough to generate income on BM's total amount of assets under management which I estimate to range between \$20 - \$50 billion. Fairfield Sentry Ltd. alone has \$5.1 billion with BM. And, while BM may say he only uses Over-the-Counter(OTC) index options, there is no way that this is possible. The OTC market should never be several times larger than the exchange listed market for this type of plain vanilla derivative.*

I love to cite Markopolos example because you know something— this amazing guy with such an amazing mind (which you can learn to develop) flunked this test:



Markopolos produced 29 red flags on the world's largest ponzi scheme and the regulators did nothing. Isn't that amazing? How did *that* happen? Was SEC corrupt and was bribed by Madoff to scuttle any investigation? No! So why did Markopolos fail in persuading SEC to catch Madoff much earlier? Two reasons: (1) SEC consisted of people who were focused reducing errors than gaining insights; and (2) Markopolos was too focussed on gaining insights than reducing errors.

So what errors did Markopolos make? Markopolos, in my view, made a number of psychological errors — the type of errors Kahneman warns us about. One such error involved the non application of an elementary principle in persuasion, as told by Ben Franklin:



“If you were to persuade, appeal to interest not reason”

In his submissions to SEC, Markopolos should have written to its Inspector General and vividly described to him the consequences of non action by SEC . He should have told him: “Listen to me you dumbass! If you don't, you may lose your career, your reputation, your self-esteem. Do you want to see your picture in the newspapers with stories highlighting how you screwed up? Stories which your childhood friends and mother-in-law will

read?”

The New York Times

September 3, 2009

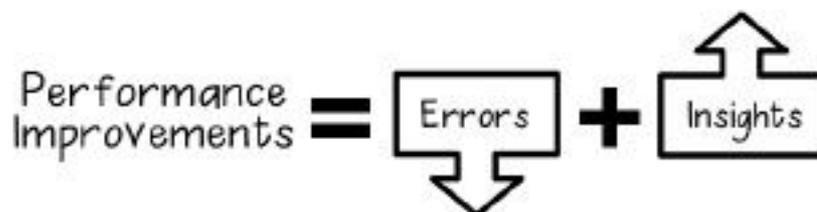


Alex Wong/Getty Images

H. David Kotz, S.E.C. inspector general, said the agency had missed “red flags.”

Now *that* would have worked way better than going beyond five or six really big out of the 29 red flags Markopolos cited in this submission!

Markopolos failed because of the imbalance in this equation.



He focussed too much on getting insights (in which he succeeded), and too little on preventing elementary psychological errors.

Story # 4: Sol Price emulates Carl Jacobi

Charlie Munger loves talking about the idea of inversion in algebra.

“There’s one mental trick that’s unbelievably useful. And that is, as you think through

reality using these models, think it through forward and also think it through backward. In other words, follow the injunction of the great algebraist, Carl Jacobi, who said, "Invert. Always invert. You're absolutely no good in algebra if you can't turn the problems around and solve them backward. And what worked for Jacobi in algebra works in the rest of life."

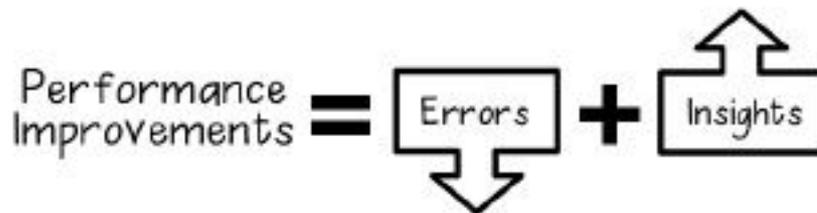
Sol Price pioneered the membership warehouse concept in Price Club which later became the enormously successful Costco, which now charges customers \$55 every year for the privilege of shopping at discounted prices. The Costco story is worth telling, but not today. For now, I want to highlight how Sol Price emulated Jacobi when he designed his business.



"Sol Price (founder of Price Club) used to say, success in business came from deciding which business you could intelligently do without. He had a list of business he didn't want. Those things he didn't want — he didn't want business from people who wrote bad checks. He didn't want business of people who shoplifted. He didn't want business of people who clogged-up his parking lot without buying very much. He carefully invented a system where he kept those people out, and succeeded by deciding what he would be better off without and avoiding it. This is a very good way to think, and it's not all that common. It's, perfectly, obvious, isn't it? And it has been of enormous help to the people

sitting at this head table. But most people just aren't trained to do that —if it's more business, they tend to want it."

Isn't that awesome? Instead of asking how to succeed, he asked how to fail and then designed a failure-resistant system! This kind of thinking is both error reducing *and* insightful because it gave Sol Price the idea of charging people money for getting a right to shop in his stores.



Let me leave you today, with just two more examples involving both error reduction and insight generation.

Example # 1: Inversion in Corporate Governance Checklist

The other day, I was working on creating a corporate governance checklist—you know the kinds of good practices you should look out for in companies you want to invest in. And then, I just inverted the problem. Apart from asking:

- A. How to *make* money by investing in companies with good corporate governance practices, I also asked myself
- B. How to *lose* your shirt by investing in companies with lousy governance, and then simply avoid those companies.

I found the second question *much* easier to answer than the first one, just like in probability, if you are asked to calculate the probability of at landing at least one heads in 10 coin flips, then the easier way to answer solve the problem is to simply calculate the probability of zero heads and then simply deduct it from 1. The *other* way, involving forward thinking, is a terribly inefficient way to solve the problem.

Thinking backwards using inversion often works better than thinking forwards.

As Charlie Munger likes to say, “All I want to know is where I am going to die, so I never go there.” In pretty much the same way, my corporate governance checklist is taking shape by using backward thinking in addition to forward thinking. This helped me easily reject managements which have:

1. A terrible track record in making expensive acquisitions; or
2. A terrible track record in diversifications; or
3. Crazily expanded using borrowed money; or
4. Created their business castles using political clout.

This way, I can reject thousands of companies I don't have to bother about anymore. As my partner often likes to say, life becomes simple, if we follow some very simple rules.

Example # 2: Inversion in Valuation

Steven Penman's excellent book "[Accounting for Value](#)" contains an equation you are all familiar with. It's a modified version of DCF valuation equation:

$$\begin{aligned} \text{Value of equity}_0 &= B_0 + \frac{(\text{ROCE}_1 - r) \times B_0}{1 + r} + \frac{(\text{ROCE}_2 - r) \times B_1}{(1 + r)^2} \\ &\quad + \frac{(\text{ROCE}_3 - r) \times B_2}{(1 + r)^2(r - g)} \\ &= B_0 + \boxed{\frac{\text{Residual earnings}_1}{1 + r} + \frac{\text{Residual earnings}_2}{(1 + r)^2}} \\ &\quad + \boxed{\frac{\text{Residual earnings}_3}{(1 + r)^2(r - g)}} \end{aligned}$$

Explicit Forecast Period

Terminal (Fantasy) Value

Essentially, the equation tells us that to create value over and above book value, the business has to generate a positive spread between return on capital and its cost on a sustainable basis. But to arrive at that value, one has to estimate earnings far into the future and that's where the trouble begins. You see, the human mind is an incredible justification machine and when you get tools like this, it goes a little (or maybe a lot) crazy. When Sir Francis Bacon said, “What a man believes, he prefers to be true” he might as well been talking about forward looking DCF valuation models with the “goal seek” function embedded inside the brains of the modellers. Many of my ex-students tell me that this is *just* what they are expected to do. This kind of thinking is likely to deliver rather foolish insights (as in “I know this is going

to be the next Apple”).

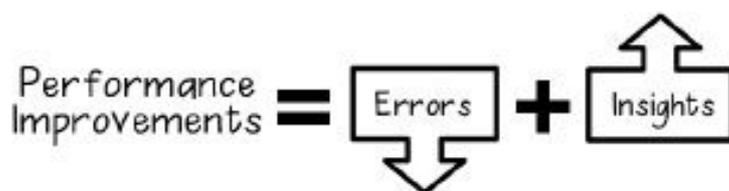
Is there a better way? Well, yes, and Penman provides it by inverting the problem. He takes the *market value* of the firm and plugs it into the left hand side of the equation and then simply solves for the value of speculative growth on the right hand side.

Plug in Market Value Instead

$$\text{Value of equity}_0 = B_0 + \frac{(\text{ROCE}_1 - r) \times B_0}{1 + r} + \frac{(\text{ROCE}_2 - r) \times B_1}{(1 + r)^2} + \frac{(\text{ROCE}_3 - r) \times B_2}{(1 + r)^2 \times r} + \text{Value of speculative growth.}$$

Derive future fundamental performance required to justify current market valuation

The beauty of this inversion is that it forces the valuer to challenge the assumptions embedded inside the firm’s current market value. This kind of thinking not only reduces errors, but also increases insights. For example, you may spot a very high-quality business capable of generating a high spread between return on capital and the going rate of interest, run by an excellent management team, but it’s current market value, under depression conditions, does not fully reflect its true growth potential. Conversely, you may find that the current stock price of the company is too high to justify the embedded required future fundamental performance, and so you may wisely avoid investing in that stock. The mental habit of thinking forwards would have exposed you to a large number of behavioral biases, Kahneman warns us about. Thinking backwards, not only prevents us from making those mistakes, it also is capable of revealing great insights.



“The mental habit of thinking backward forces objectivity – because one of the ways you think a thing through backward is you take your initial assumption and say, “Let’s try and disprove it.” That is not what most people do with their initial assumption. They try and confirm it. It’s an automatic tendency in psychology – often called “first-conclusion

bias.”

Over the course of the next few months, we will explore ideas on both error reduction *and* insight generation.

Welcome to BFBV!