

## Three steps back...

What we learned from Michael Lewis' new book



We read Michael Lewis' new book over the holidays, a book that shows how people, in certain circumstances, exhibit the rationality of a moth. "The Undoing Project" is notionally a history of two professors — Daniel Kahneman and Amos Tversky — who turned the field of psychology upside down and whose work formed the basis of what was later to become known as behavioural economics, putting paid to this ridiculous notion of the "rational agent." Our takeaway, of course, relates to implications in the financial world, for irrationality sweeps through financial markets like viral infections sweep through daycare centers. Of course, as they say, markets can stay irrational longer than you can stay solvent, but in the least it feels better to know why this happens. As such, the book is a tonic.

The material is not new; indeed, the ideas this history documents emerged in the late 60's and 70's. But this is Michael Lewis telling the story and these ideas come across as fresh as ever. Besides, it is not as though anyone seems to have learned from these revelations; the research might as well have been published last week.

People are irrational in (at least!) two ways: judgement and decision making. Decision making is what you do once you've made a judgement and even when the judgement is correct, people still do things that make no sense. One quick example: folks are predisposed to take on more risk to avoid a loss and do quite the opposite to make a gain. For more here, read the book.

Judgement boils down to estimating conditional probabilities: *Given this, what is the probability of that?* More concretely, given a "positive earnings new release", what is the probability that the company becomes or remains a good investment? Given "good drill results", what is the probability that they've uncovered the motherlode? Given a positive mammogram, what is the probability that the patient will die of breast cancer? Humans are effectively sampling machines: *this happened, what do you think?*

In many cases we are quite good at this, for if we weren't, the species would have been wiped out by tigers or some other predator by now. But at the edges our ability to form sound judgements is flawed.

It used to be thought that we calculated conditional probabilities "by the book", or the way a computer would do

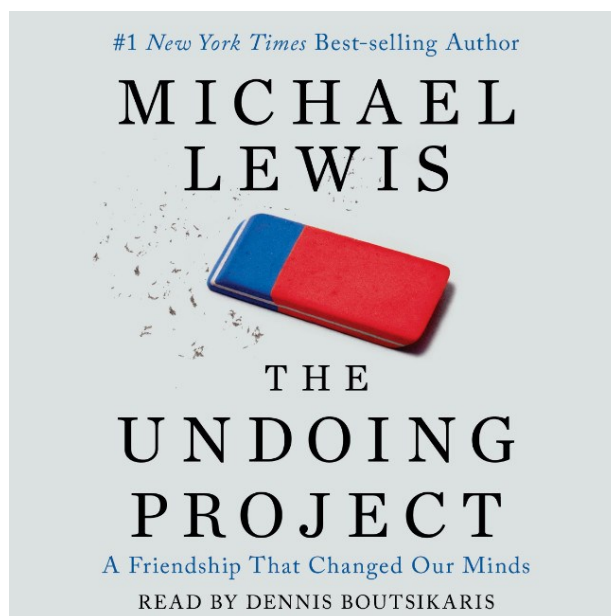
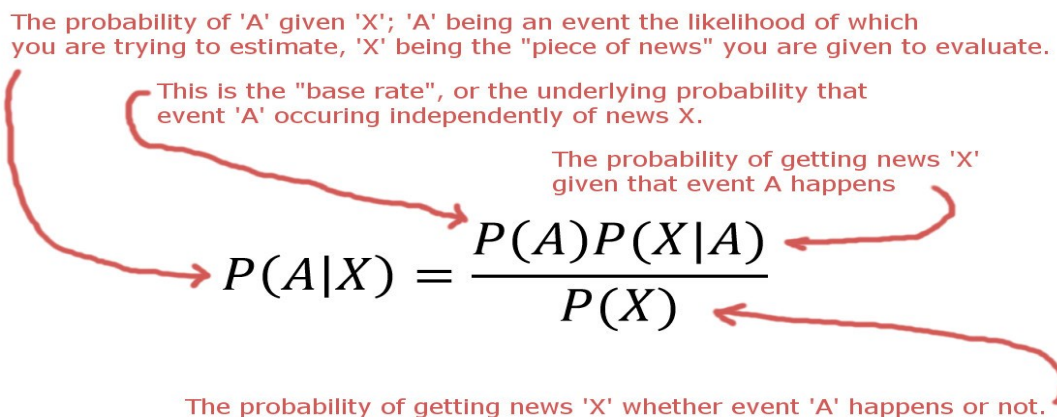


Figure 1: A free plug for Michael Lewis' new book.

it, which is to say, correctly. This was disproved by the psychologists whose careers Lewis describes. Rather, humans form judgements by comparing new "samples" to a reference they've compiled over the years. A positive mammogram? Oh god, my aunt had a positive mammogram and that ended tragically. 200m of 12g/t gold? That was the kind of drill hole they pulled on that project my brother-in-law had a piece of and, when they eventually sold the project, he went and bought a tropical island with the proceeds. This "heuristic" makes sense: if our distant ancestors saw two blue eyes staring out at them from the jungle, they're going to think back to the time someone's little brother got pounced on and dragged back into the bush.

If this heuristic saw the species through to the present day (and it did) it is less effective when applied to problems at the margin. The unseen flaw is that the tests themselves are imperfect and we're not very good at estimating how imperfect they are; nor are we good at understanding the implications of these faulty tests, especially in light of extreme "base rate" probabilities.

Base rate probabilities, as Lewis calls them (otherwise known as the *a priori* probabilities), are the unconditional probabilities of something coming to pass; that is, the probability of something happening absent any testing at all. Without having read any of the press releases, what is your estimation of the likelihood of a tech start-



**Figure 2:** Apologies for the math, but we went back and dredged this up from our university days just to try to get our heads around it and understand why we are so easily fooled. This is Bayes Law, which is the correct way of calculating: “Given this, what is the likelihood of that?” Most of the Undoing Project is about why we are bad at winging this in our heads.  $P(A|X)$  is what you are trying to estimate: given hot drill hole X, what is the chance of getting motherlode A? Why we get this so wrong is we misestimate  $P(A)$  and  $P(X)$ . Generally,  $P(A)$  — the probability of finding motherlodes in general — is very small while  $P(X)$  — the probability of getting a hot drill hole, is, because of the false positive rate, much larger. Therefore, the ratio of  $P(A)/P(X)$  can be diminutive. In the blizzard of news and market chatter, obscured by dreams of buying a yellow Porsche with your fantastic winnings, we lose sight of this.

up making it big? Or suppose you landed on earth from a distant (yet financially sophisticated!) planet; you’ve never seen a Fed Minute or read an opinion piece on the merits of QE – do negative yields make sense? Or imagine a country that has gone from consuming 2% of the world’s copper to supply to 30% of the world’s copper supply in a few short decades; without knowing the name of the country or the nature of its credit engorged economic miracle, do you think this can last?

When you cross faulty testing with improbable events human judgement departs from the rational in geometric fashion. For example, the probability that a 25-year old woman who receives the devastating news of a positive mammogram has cancer is only about 1 in 10. This is because the likelihood of a young woman getting cancer is very low and the false positive rate of mammograms is about 10%. Put those together and the odds swing wildly against intuition. The chances that one hot drill hole buys you a tropical island are far, far less than that. It is this flaw in the brain’s wiring that causes us to jump on bandwagons, that makes us feel reticent to fly after a major airline disaster, and, when faced with a plunging tape (flash crashing or otherwise) renders us inclined to sell everything.

This base rate is critically important and, although Lew-

is fails to mention it, humans have a heuristic for this too: if something is too good (or bad) to be true, it probably is. But that’s a tough concept to hang on to when you see those two eyes staring out at you from the jungle, or when you see that glittering walnut of free gold in the drill core.

Lessons learned:

- Be skeptical of test results – news, numbers, tips from your brother-in-law. Without exception these samples are imperfect representations of the underlying reality and it is very difficult to gauge how imperfect they are.
- Better yet, read less news. Turn off your screen. Base rate probabilities determine outcomes far more than we appreciate on a day to day basis. Take three steps back, away from the noise and ask yourself: is this likely or not?
- Notwithstanding all this, you will likely be wrong anyway. Buy/sell accordingly. Which is to say: don’t pay for what you know you don’t know.

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Toronto, Ontario  
January 31, 2017

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