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CONTENTS

PART A: ARTICLES/ CASES

- 1. FOOLED BY RANDOMNESS**
- 2. DOES FINANCE BENEFIT SOCIETY**

PART B: SNIPPETS

- 1. WHEN EMOTIONAL REASONING TRUMPS IQ**
- 2. EVERYTHING IS RELATIVE**
- 3. COOKING DECISIONS RATHER THAN BOOKS**
- 4. HOW SHOULD YOU PICK A MUTUAL FUND**

PART C: WIT AND WISDOM

- 1. HUMOUR**
- 2. WISE SAWS**

ARTICLES /CASES

1. FOOLED BY RANDOMNESS

Dr. Prasanna Chandra

Nassim Nicholas Taleb *Fooled by Randomness :The Hidden Role of Chance in Life and in the Markets*, Random House 2005

This book is the synthesis of, on one hand, the no-nonsense practitioner of uncertainty who spent his professional life trying to resist being fooled by randomness and *buck* the emotions associated with probabilistic outcomes and, on the other, the aesthetically obsessed, literature-loving human being willing to be fooled by any form of nonsense that is polished, refined, original, and tasteful.

This comes straight from the gut; it is a personal essay primarily discussing its author's thoughts, struggles, and observations connected to the practice of risk taking.

Nassim Taleb's best-selling book *Fooled by Randomness* seeks to tease those who take themselves and their knowledge seriously. As Taleb says: "It certainly takes bravery to remain skeptical; it takes inordinate courage to introspect to confront oneself to accept one's limitations- scientists are seeing more and more evidence that we are specifically designed by mother nature to fool ourselves."

Superstition – Proneness The formation of our beliefs is fraught with superstitions and in this we are very close to our ancestors who roamed the savannah. As Taleb puts it: "Just as one day some primitive tribesman scratched his nose, saw rain falling, and developed an elaborate model of scratching his nose to bring on much needed rain, we link economic prosperity to some rate cut by the Federal Reserve Board, or the success of a company with the appointment of the new president at the helm." Biographies of successful men and women explain how they made it big in life. The expression "the right time and right place" weakens whatever conclusion can be inferred from them. As Taleb says, "The confusion strikes people of different persuasions; the literature professor invests a deep meaning into a mere coincidental occurrence of word patterns, while the economist proudly detects 'regularities' and 'anomalies' in data that are plain random."

Courage Taleb believes what "courage" often comes from underestimating the share of randomness in things rather than the more noble quality of sticking one's neck out for a certain belief. As Taleb puts it, "In my experience (and in scientific literature) economic 'risk takers' are rather the victims of delusions (leading to over optimism and overconfidence with their underestimation of possible adverse outcomes) than the opposite. Their 'risk taking' is frequently random foolishness."

Backward Causality Our brain sometimes gets the arrow of causality backward. As Taleb explains: “Assume that good qualities cause success; based on that assumption, even though it seems intuitively correct to think so, the fact that every successful person is intelligent, hardworking, and persevering does not imply that every intelligent, hardworking, persevering person is necessarily successful.”

Probability the Mother of All Sciences As an introspective field of enquiry, probability may be regarded as the mother of all sciences. Taleb elaborates as follows: “Literally every great thinker has dabbled with it. The two greatest minds to me, Einstein and Keynes, both started their intellectual journeys with it. Einstein’s article on the theory of Brownian motion can be used as the backbone of the random walk approach used in financial models. Keynes’ *Treatise on Probability* is an important work.”

Karl Popper’s Influence on Science Taleb argues that philosopher Karl Popper influenced science more than perhaps anyone. According to Popper there are only two types of theories.

1. Theories that are known to be wrong, as they have been tested adequately and rejected. Popper calls them as falsified theories.
2. Theories that have not yet been falsified, but are exposed to the possibility of being proved wrong.

Popper was not willing to blindly accept the notion that knowledge can always increase with incremental information, a notion which is the foundation of statistical information.

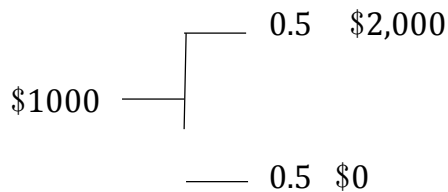
Unfairness of Life Life is unfair and that too in a nonlinear way. A small advantage can translate into a highly disproportionate payoff. Even worse, even without any advantage, random luck can produce a bonanza.

Taleb says that Bill Gates is a good example of spectacular lucky success. As he comments, “While it is hard to deny that Gates is a man of high personal standards, work ethics, and above average intelligence, is he the best? Does he deserve it? Clearly, not.” Brian Arthur, an economist concerned with nonlinearities at the Santa Fe Institute, wrote that chance events coupled with positive feedback rather than technological superiority have an enormous bearing on success.

Inappropriateness of Mathematical Modeling Techniques Taleb is critical of the use of mathematical modeling techniques used in economics. He believes that people like Leon Walras, Gerard Debreu, and Paul Samuelson who pioneered the use of mathematics in economics did not consider the fact that “either the class of mathematics they were using was too restrictive for the class of problems they were dealing with, or perhaps they should be aware that the precision of the language of

mathematics would lead people to believe that they had solutions when in fact they had none.”

Probability Blindness We are probability blind because our brain can properly handle one and only one state at once. To illustrate this, Taleb gives the example of a bet that costs \$1000 and has two equiprobable outcomes, \$2,000 and \$0.



While the mathematically expected value of this bet is \$1000 ($0.5 \times \$2,000 + 0.5 \times \0) it is difficult for us to imagine (that is visualise, not calculate, mathematically) the value being \$1,000. As Taleb says, “We can conjure up one and only one state at a given time, i.e. either 0 or \$2,000. Left to our devices, we’re likely to bet in an irrational way, as one of the states would dominate the picture- the fear of ending with nothing or the excitement of an extra \$1,000.”

Behavioural Economics Taleb argues that Daniel Kahneman and Amos Tversky, two non- economists, have provided more valuable insights into economic thinking than people like John Maynard Keynes, Alfred Marshall, Paul Samuelson, and Milton Friedman.

Herbert Simon was the first thinker to suggest that our brains used shortcuts and resorted to “satisficing” (the combining together of satisfy and suffice) rather than “optimising.”

Kahneman and Tversky took a different direction to figure out the rules in humans that cause them to deviate from rationality as defined in economics. As Taleb describes, “For them, these rules, which they called heuristics, were not merely simplification of rational models, but were different in methodology and category... They started an empirical research tradition called the ‘heuristics and biases’ tradition that attempted to catalogue them.” Their efforts spawned a scientific branch of economics called behavioural economics.

The Role of Emotions In his seminal book *Descartes Error*, neuroscientist Antonio Damasio argued that emotions are essential for decision making. A person devoid of emotions is incapable of making even a simple decision. Hence psychologists call emotions the “lubricants of reason.”

In his book *Emotional Brain* Joseph Ledoux goes a step further. He argues that the role of emotions is even more potent: the connections from the emotional systems to

the cognitive systems are stronger than the connections the other way. It seems that we feel emotions (limbic brain) and then find an explanation. As Taleb says: “The epiphany I had in my career in randomness came when I understood that I was not strong enough, to even try to fight my emotions. Besides, I believe that I need my emotions to formulate my ideas and get the energy to execute them.”

Caveman Economics Just as behavioural economics stemmed from the work of cognitive psychology pioneered by Kahneman and Tversky, there is a branch of economics which may be called as “caveman economics” coming out of evolutionary psychology. The economist – biologist Terry Burnham, co- author of *Mean Genes*, is a pioneer in this area. About 99.9 percent of human life was spent in the hunter-gatherer phase. The selection processes of that phase have sculpted and shaped our genome and plasticity. Since 1780 when the industrial revolution began, there has been a ‘radical environmental mutation,’ but the human genome has been virtually the same. This means that there is a profound mismatch between our genes, bodies, and brains and the demands of the modern- day environment. As Taleb says, “I have not told too many of my colleagues that their decision making contains some lingering habits of caveman- but when markets experience an abrupt move, I experience the same rush of adrenaline as if a leopard were seen prowling near my trading desk.”

Taleb’s Generator Taleb says that it took him an entire lifetime to find what his generator is. It is as follows. “We favour the visible, the embedded, the personal, the narrated, and the tangible; we scorn the abstract. Everything good (aesthetics, art)and wrong (Fooled by Randomness) with us seems to flow from it.

Table of Confusion The book *Fooled by Randomness* is about luck disguised and perceived as skill and, more generally, randomness disguised and perceived as determinism. The central distinctions presented in the book are summarised below:

Exhibit 1.1 Table of Confusion

Luck	Skills
Randomness	Determinism
Probability	Certainty
Belief, conjecture	Knowledge, certitude
Theory	Reality
Anecdote, coincidence	Causality, law
Forecast	Prophecy
Lucky idiot	Skilled investor
Survivorship bias	Market outperformance
Volatility	Return
Stochastic variable	Deterministic variable
Noise	Signal

Polarised Visions of Life There are two polarised visions of man. One of them is the Utopian vision of economists. They believe with reason and rationality we can overcome cultural impediments and in order to achieve, inter alia, happiness and rationality.

The other view is the Tragic Vision of man which holds that there are inherent limitations and constraints on individual or collective action. According to Taleb, the proponents of this view include Karl Popper (uncertainty), Frederick Hayek and Milton Friedman (suspicion of government), Adam Smith (intentional fallacy), Daniel Kahneman (heuristics and biases), the speculator George Soros. Taleb is himself a champion of the Tragic Vision. We are so defective and so mismatched to our environment that we can just work with our flaws. I still wonder why they blindly believe in ineffectual methods. Delivering advice assumes that one has meaningful control over our actions. We will see how modern behavioural science shows this to be true.

Proportions of Performance and Noise Over Different Observation Periods Average return represents performance and standard deviation (volatility) represents noise. If equities earn an average annual return of 15 per cent with a standard deviation of 10 per cent, then the performance and noise for various observation periods are as given in Exhibit 1.2

Exhibit 1.2 Performance and Noise over Different Observation Periods

<i>Observation Period</i>	<i>Performance (Average Return)</i>	<i>Noise (Standard Deviation)</i>
2 years	15 per cent	7.07 per cent
1 year	15 per cent	10.00 per cent
3 months	15 per cent	20.00 per cent
1 month	15 per cent	34.64 per cent
1 week	15 per cent	72.11 per cent
1 day	15 per cent	191.10 per cent

Thus, over 2 years, we observe 0.47 parts noise for one part performance; over 1 year, we observe 0.67 parts noise for one part performance; over one-quarter, we observe 1.33 parts noise for one part performance; over one month, we observe 2.31 parts noise for one part performance; over one week, we observe 4.81 parts noise for one part performance; and over 1 day, we observe 12.74 parts noise for one part performance. As the observation period contracts, noise dominates performance.

2. DOES FINANCE BENEFIT SOCIETY

Dr. Prasanna Chandra

In his presidential address to the American Finance Association in 2015, Luigi Zingales argued that the contribution of finance to society in the last few decades has not been commensurate with its growing size. The key points of his address are presented below:

1. Finance has played a crucial role in promoting entrepreneurship, fostering growth, alleviating poverty, managing risk, allocating resources, providing valuable price signals, curbing agency problems, and alleviating information asymmetries.
2. A good financial system is essential for a well- functioning economy and as Joseph Stiglitz said, “over the long sweep of history financial innovation has been important in promoting growth.”
3. The last four to five decades have seen major revolution in finance and a significant growth in the financial sector. For example, the financial industry in the U.S. accounted for 8% of GDP in 2012, when it accounted for only 4% of GDP in 1960.
4. There is no theoretical reason or empirical evidence to support the view that all the growth of the financial sector in the past few decades has been beneficial to the society. In fact, one can argue theoretically as well as empirically that a part of the growth of the financial sector has been pure rent seeking.
5. The First Welfare Theorem, proposed by Nobel laureates Kenneth Arrow and Gerard Debreu, demonstrates that in a competitive economy individual choices lead to Pareto efficient allocation. This theorem, however, holds only if every relevant good is traded in a market at publicly known prices. This implies that there is a complete set of markets. When this condition is not satisfied, which often is the case, the Pareto optimality of the equilibrium is not guaranteed. More importantly, for the financial sector, as Oliver D. Hart (1975) has shown that if you start from an incomplete market economy, adding a market can hurt all agents. Elul Ronel (1995) further shows that Hart’s result, far from being an exception, is very robust and pervasive. Hence there is no theoretical support for the view that financial innovation increases welfare. As Luigi Zingales comments, “I am not aware of any evidence that the creation and growth of the junk bond market, the option and futures market, or the development of the OTC derivatives are positively correlated with economic growth.” He adds, “It is possible that our profession is subject to fads and the type of evidence we are looking for is affected by those fads as well.”
6. There seems to be more prevalence of rent- seeking activities (activities that are profitable from the individual point of view but not from the societal point of view) in finance than in many other sectors of the society.

In the financial sector ‘duping’ takes place in two ways: ‘straight’ duping and ‘indirect’ duping. In straight duping investors are sold a product that they do not understand and would have never wanted had they understood it. An example of ‘straight duping’ is the structured products sold to depositors throughout Europe. Celerier and Value analysed 55,000 retail structured issued in 17 European countries from 2002 to 2010. They found that more products with higher markups were sold to unsophisticated investors. Another example is the sale of lemon securities to unsophisticated buyers, as happened when Italian banks dumped Parmalat and Cirio bonds on their depositors shortly before these companies went bankrupt.

In 'indirect duping' the basic product is not a lemon, but it is packaged with some optional overpriced add-ons.

While such distortions are present in every sector, the scope for abuse is greater in the financial sector because of three reasons: financial engineering provides flexibility to exploit agency problems; the principals (shareholders in publicly traded companies or tax payers) are dispersed and incapable of acting cohesively; the speed of innovation is very fast.

As Zingales observes, "These opportunities are so large that even governments take advantage of them. Subsidized credit is a very popular form of government intervention because it is less transparent to the taxpayers. So are various forms of financial engineering, such as the implicit bailout options to Fannie Mae and Freddie Mac, and many non-recourse loans granted by the Fed during the crisis."

Zingales fears that fraud has become a feature, and not just a bug, of the financial sector.

7. Economists like Joseph Stiglitz blame the inefficiencies of the financial sector on market imperfections and invoke government intervention as the solution. This argument ignores the reality that the observed inefficiency of the financial sector is often not on account of market imperfections, but due to government intervention itself. The most conspicuous example of this is the put option provided by the government to the financial sector.
8. Researchers should act as whistle blowers and expose these distortions. Justice Louis Brandeis wrote, "Publicity is justly recommended as a remedy for social and industrial diseases."

B. SNIPPETS

1. WHEN EMOTIONAL REASONING TRUMPS IQ

In a study conducted by Roderick Gilkey et. al. a sample of managers in an executive MBA programme at Wharton School were asked to react to hypothetical strategic and tactical management dilemmas and their brain activity was measured using fMRI. The study looked at how the various brain regions were interacting in response to particular tasks.

People generally associate the prefrontal cortex with strategic thought. The prefrontal cortex is the seat of anticipation, pattern recognition, probability assessment, risk appraisal and abstract thinking and these abilities are supposed to help managers solve problems. However, when the researchers examined the best strategic performers in the sample, they found significantly less neural activity in the prefrontal cortex compared to neural activity in areas like the insula, the anterior cingulate cortex, and the superior temporal sulcus (these are areas that are associated

with “gut” feelings, empathy, and emotional intelligence). Put differently strategic thinking relied less on conscious executive function and more on unconscious emotional processing. The role of unconscious emotional processing was even more pronounced as far as tactical problems were concerned.

The researchers concluded: “Of course, IQ- based reasoning is valuable in both strategic and tactical thinking- but it’s clear that managers integrate their brain processes as they become better strategists. When companies realize that, they may approach strategy and execution more holistically.”

2. EVERYTHING IS RELATIVE

Everything seems to be assessed in relative terms. As Daniel Ariely wrote in his fascinating book *Predictably Irrational*, “Everything is relative when it shouldn’t be. Humans rarely choose in ‘absolute terms.’ We don’t have an internal meter that tells us how much things are worth. Rather, we focus on the relative advantage of one thing over another, and estimate value accordingly.”

Philosophers, economists, and others have expressed this thought in different ways. Here is a sampling of their views:

Aristotle: “Envy is pain at the good fortune of others. We envy those who are near us in time, place, age or reputation.”

Arthur Schopenhauer: “As Hobbes observes, all mental pleasure consists in being able to compare oneself with others to one’s advantage.”

Mark Twain: “Man will do many things to get himself loved; he will do all things to get himself envied.”

Charles P. Kindeberger: “There is nothing so disturbing to one’s well- being and judgment as to see a friend get rich:”

3. COOKING DECISIONS RATHER THAN BOOKS

In general, accounting regulations have diminished the latitude available to companies to manipulate reports or cook books. In response, the gaming of results has moved from accounting manipulation to corporate decision making. Companies are manipulating operating decisions to produce higher earnings. Put differently, they are cooking decisions rather than books. This is dangerous because it can impair a company’s long- term competitiveness. The focus on short- term earnings can compromise long- term value creation. In the wake of this, investors and directors will naturally demand more disclosure on operating decisions that are more amenable to manipulation, to determine whether they are being made to artificially boost financial results or guided by sound business considerations.

To distinguish between the two, analysts and investors are applying new techniques. One approach that is gaining favour in financial markets is based on Benford Law. Named after an early twentieth century British scientist, Benford law says that in lists of numbers generated from any naturally occurring data source (cash receipt, trading volume on stock exchanges, procurement entries, and so on), the first digit for each number will be 1 (for example 15, 134, 1574) about 30 percent of times. The second digit for each number will be 2 (for example 12, 121, 1,289) about 18 percent of the time. Each successive number will represent a progressively smaller proportion and when it gets to 9 it is less than 5 percent of the times.

Benford law seems to apply to a practically limitless array of data sets: population of cities, cash receipts, molecular weights of chemicals, lengths of rivers.

If a set of accounting data violates Benford law, there is prima facie evidence of manipulation. Benford law is being used by the Big 4 accounting firms to detect accounting irregularities, by the Internal Revenue Service in the U.S. to detect tax frauds, and by insurance companies to detect false claims.

4. HOW SHOULD YOU PICK A MUTUAL FUND

Most people find a respectable fund house and choose funds that have performed well recently. In a field like investing where luck plays a huge role in determining results, at least in the short run, this approach will not work.

What should one do? The answer is to focus on process because in a probabilistic activity like investing what matters in the long run is the process. It is not easy to judge the process, but you can do well by focusing on three areas.

Analytical approach Is the investment manager's analytical approach economically sensible, disciplined, and flexible.

Behavioural biases Does the process followed recognize and manage common behavioural biases such as overconfidence and anchoring.

Organizational structure Is the organizational structure focused on generating returns for the investors or returns for the investment company. One helpful statistic in this regard is *active share*, a measure of how different is a fund from the benchmark to which it compared. According to Michael Mauboussin, "Funds with high active share, a sign of dedicated stock picking and moderate tracking error- which suggests few big factor bets, have delivered excess returns on average over the past 50 years."

PART C: WIT AND WISDOM

1. HUMOUR

- Prakash went to State Bank of India to open a savings bank account. The manager was surprised when Prakash said that he would return after he had been to Delhi. So he asked Prakash, “Why was he going to Delhi?” Prakash said that in the application form it is mentioned: “To be filled in CAPITAL.”
- A woman decided to economise whenever possible. So instead of having her dress dry-cleaned she washed it by hand. She proudly boasted to her husband, ‘We are hundred rupees richer because I washed this dress by hand.’ The husband replied, “Great. Wash it again.”

2. WISE SAWS

- “Reputation is what other people know about you. Honour is what you know about yourself.”

Lois McMaster Bujold

- “The very first law in advertising is to avoid the concrete promise and cultivate the delightfully vague.”

Bill Cosby