PROLOGUE

MOSQUES IN THE CLOUDS

T his book is about luck disguised and perceived as nonluck (that is, skills) and, more generally, randomness disguised and perceived as non-randomness (that is, determinism). It manifests itself in the shape of the *lucky fool,* defined as a person who benefited from a disproportionate share of luck but attributes his success to some other, generally very precise, reason. Such confusion crops up in the most unexpected areas, even science, though not in such an accentuated and obvious manner as it does in the world of business. It is endemic in politics, as it can be encountered in the shape of a country's president discoursing on the jobs that "he" created, "his" recovery, and "his predecessor's" inflation.

We are still very close to our ancestors who roamed the savannah. The formation of our beliefs is fraught with superstitions—even today (I might say, especially today). Just as one day some primitive tribesman scratched his nose, saw rain falling, and developed an elaborate method of scratching his nose to bring on the 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." Bookstores are full of biographies of successful men and women presenting their specific explanation on how they made it big in life (we have an expression, "the right time and the right place," to weaken whatever conclusion can be inferred from them). This 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.

At the cost of appearing biased, I have to say that the literary mind can be intentionally prone to the confusion between *noise* and *meaning,* that is, between a randomly constructed arrangement and a precisely intended message. However, this causes little harm; few claim that art is a tool of investigation of the Truth—rather than an attempt to escape it or make it more palatable. Symbolism is the child of our inability and

unwillingness to accept randomness; we give meaning to all manner of shapes; we detect human figures in inkblots. *I saw mosques in the clouds* announced Arthur Rimbaud, the nineteenth-century French symbolic poet. This interpretation took him to “poetic”Abyssinia (in East Africa), where he was brutalized by a Christian Lebanese slave dealer, contracted syphilis, and lost a leg to gangrene. He gave up poetry in disgust at the age of nineteen, and died anonymously in a Marseilles hospital ward while still in his thirties. But it was too late. European intellectual life developed what seems to be an irreversible taste for symbolism—we are still paying its price, with psychoanalysis and other fads.

Regrettably, some people play the game too seriously; they are paid to read too much into things. All my life I have suffered the conflict between my love of literature and poetry and my profound allergy to most teachers of literature and “critics.” The French thinker and poet Paul Valery was surprised to listen to a commentary of his poems that found meanings that had until then escaped him (of course, it was pointed out to him that these were intended by his subconscious).

More generally, we underestimate the share of randomness in about everything, a point that may not merit a book—except when it is the specialist who is the fool of all fools. Disturbingly, science has only recently been able to handle randomness (the growth in available information has been exceeded only by the expansion of noise). Probability theory is a young arrival in mathematics; probability applied to practice is almost nonexistent as a discipline. In addition we seem to have evidence that what is called “courage” comes from an underestimation of the share of randomness in things rather than the more noble ability to stick one’s neck out for a given belief. In my experience (and in the scientific literature), economic “risk takers” are rather the victims of delusions (leading to overoptimism and overconfidence with their underestimation of possible adverse outcomes) than the opposite. Their “risk taking” is frequently randomness foolishness.

Consider the left and the right columns of Table P.1 . The best way to summarize the major thesis of this book is that it addresses situations (many of them tragicomical) where the left column is mistaken for the

right one. The subsections also illustrate the key areas of discussion on which this book will be based.

The reader may wonder whether the opposite case might not deserve some attention, that is, the situations where nonrandomness is mistaken for randomness. Shouldn't we be concerned with situations where patterns and messages may have been ignored? I have two answers. First, I am not overly worried about the existence of undetected patterns. We have been reading lengthy and complex messages in just about any manifestation of nature that presents jaggedness (such as the palm of a hand, the residues at the bottom of Turkish coffee cups, etc.). Armed with home supercomputers and chained processors, and helped by complexity and "chaos" theories, the scientists, semiscientists, and pseudoscientists will be able to find portents. Second, we need to take into account the costs of mistakes; in my opinion, mistaking the right column for the left one is not as costly as an error in the opposite direction. Even popular opinion warns that bad information is worse than no information at all.

However interesting these areas could be, their discussion would be a tall order. There is one world in which I believe the habit of mistaking luck for skill is most prevalent—and most conspicuous—and that is the world of markets. By luck or misfortune, that is the world in which I have operated most of my adult life. It is what I know best. In addition, economic life presents the best (and most entertaining) laboratory for the understanding of these differences. For it is the area of human undertaking where the confusion is greatest and its effects the most pernicious. For instance, we often have the mistaken impression that a strategy is an excellent strategy, or an entrepreneur a person endowed with "vision," or a trader a talented trader, only to realize that 99.9% of their past performance is attributable to chance, and chance alone. Ask a profitable investor to explain the reasons for his success; he will offer some deep and convincing interpretation of the results. Frequently, these delusions are intentional and deserve to bear the name "charlatanism."

If there is one cause for this confusion between the left and the right sides of our table, it is our inability to think critically—we may enjoy presenting conjectures as truth. It is our nature. Our mind is not

equipped with the adequate machinery to handle probabilities; such infirmity even strikes the expert, sometimes just the expert.

Table P.1 Table of Confusion
Presenting the central distinctions used in the book

One

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IF YOU'RE SO RICH, WHY AREN'T YOU SO SMART?

An illustration of the effect of randomness on social pecking order and jealousy, through two characters of opposite attitudes. On the concealed rare event. How things in modern life may change rather rapidly, except, perhaps, in dentistry.

NERO TULIP

Hit by Lightning

N ero Tulip became obsessed with trading after witnessing a strange scene one spring day as he was visiting the Chicago Mercantile Exchange. A red convertible Porsche, driven at several times the city speed limit, abruptly stopped in front of the entrance, its tires emitting the sound of pigs being slaughtered. A visibly demented athletic man in his thirties, his face flushed red, emerged and ran up the steps as if he were chased by a tiger. He left the car double-parked, its engine running, provoking an angry fanfare of horns. After a long minute, a bored young man clad in a yellow jacket (yellow was the color reserved for clerks) came down the steps, visibly untroubled by the traffic commotion. He drove the car into the underground parking garage—perfunctorily, as if it were his daily chore.

That day Nero Tulip was hit with what the French call a *coup de foudre,* a sudden intense (and obsessive) infatuation that strikes like lightning. "This is for me!" he screamed enthusiastically—he could not help comparing the life of a trader to the alternative lives that could present themselves to him. Academia conjured up the image of a silent university office with rude secretaries; business, the image of a quiet office staffed with slow thinkers and semislow thinkers who express themselves in full sentences.

Temporary Sanity

Unlike a *coup de foudre,* the infatuation triggered by the Chicago scene has not left him more than a decade and a half after the incident. For Nero swears that no other lawful profession in our times could be as devoid of boredom as that of the trader. Furthermore, although he has not yet practiced the profession of high-sea piracy, he is now convinced that even that occupation would present more dull moments than that of the trader.

Nero could best be described as someone who randomly (and abruptly) swings between the deportment and speech manners of a church historian and the verbally abusive intensity of a Chicago pit trader. He can commit hundreds of millions of dollars in a transaction without a blink or a shadow of a second thought, yet agonize between two appetizers on the menu, changing his mind back and forth and wearing out the most patient of waiters.

Nero holds an undergraduate degree in ancient literature and mathematics from Cambridge University. He enrolled in a Ph.D. program in statistics at the University of Chicago but, after completing the prerequisite coursework, as well as the bulk of his doctoral research, he switched to the philosophy department. He called the switch “a moment of temporary sanity,” adding to the consternation of his thesis director, who warned him against philosophers and predicted his return back to the fold. He finished writing his thesis in philosophy. But not the Derrida continental style of incomprehensible philosophy (that is, *incomprehensible* to anyone outside of their ranks, like myself). It was quite the opposite; his thesis was on the methodology of statistical inference in its application to the social sciences. In fact, his thesis was indistinguishable from a thesis in mathematical statistics—it was just a bit more thoughtful (and twice as long).

It is often said that philosophy cannot feed its man—but that was not the reason Nero left. He left because philosophy cannot entertain its man. At first, it started looking futile; he recalled his statistics thesis director’s warnings. Then, suddenly, it started to look like work. As he became tired of writing papers on some arcane details of his earlier papers, he gave up the academy. The academic debates bored him to

tears, particularly when minute points (invisible to the noninitiated) were at stake. Action was what Nero required. The problem, however, was that he selected the academy in the first place in order to kill what he detected was the flatness and tempered submission of employment life.

After witnessing the scene of the trader chased by a tiger, Nero found a trainee spot on the Chicago Mercantile Exchange, the large exchange where traders transact by shouting and gesticulating frenetically. There he worked for a prestigious (but eccentric) *local,* who trained him in the Chicago style, in return for Nero solving his mathematical equations. The energy in the air proved motivating to Nero. He rapidly graduated to the rank of self-employed trader. Then, when he got tired of standing on his feet in the crowd, and straining his vocal cords, he decided to seek employment "upstairs," that is, trading from a desk. He moved to the New York area and took a position with an investment house.

Nero specialized in quantitative financial products, in which he had an early moment of glory, became famous and in demand. Many investment houses in New York and London flashed huge guaranteed bonuses at him. Nero spent a couple of years shuttling between the two cities, attending important "meetings" and wearing expensive suits. But soon Nero went into hiding; he rapidly pulled back to anonymity—the Wall Street stardom track did not quite fit his temperament. To stay a "hot trader" requires some organizational ambitions and a power hunger that he feels lucky not to possess. He was only in it for the fun—and his idea of fun does not include administrative and managerial work. He is susceptible to conference room boredom and is incapable of talking to businessmen, particularly the run-of-the-mill variety. Nero is allergic to the vocabulary of business talk, not just on plain aesthetic grounds. Phrases like "game plan," "bottom line," "how to get there from here," "we provide our clients with solutions," "our mission," and other hackneyed expressions that dominate meetings lack both the precision and the coloration that he prefers to hear. Whether people populate silence with hollow sentences, or if such meetings present any true merit, he does not know; at any rate he did not want to be part of it. Indeed Nero's extensive social life includes almost no businesspeople. But unlike me (I can be extremely humiliating when someone rubs me the wrong way with inelegant pompousness), Nero handles himself with gentle aloof-ness in these circumstances.

So, Nero switched careers to what is called proprietary trading. Traders are set up as independent entities, internal funds with their own allocation of capital. They are left alone to do as they please, provided of course that their results satisfy the executives. The name proprietary comes from the fact that they trade the company's own capital. At the end of the year they receive between 7% and 12% of the profits generated. The proprietary trader has all the benefits of self-employment, and none of the burdens of running the mundane details of his own business. He can work any hours he likes, travel at a whim, and engage in all manner of personal pursuits. It is paradise for an intellectual like Nero who dislikes manual work and values unscheduled meditation. He has been doing that for the past ten years, in the employment of two different trading firms.

Modus Operandi

A word on Nero's methods. He is as conservative a trader as one can be in such a business. In the past he has had good years and less than good years—but virtually no truly "bad" years. Over these years he has slowly built for himself a stable nest egg, thanks to an income ranging between $300,000 and (at the peak) $2.5 million. On average, he manages to accumulate $500,000 a year in after-tax money (from an average income of about $1 million); this goes straight into his savings account. In 1993, he had a bad year and was made to feel uncomfortable in his company. Other traders made out much better, so the capital at his disposal was severely reduced, and he was made to feel undesirable at the institution. He then went to get an identical job, down to an identically designed workspace, but in a different firm that was friendlier. In the fall of 1994 the traders who had been competing for the great performance award blew up in unison during the worldwide bond market crash that resulted from the random tightening by the Federal Reserve Bank of the United States. They are all currently out of the market, performing a variety of tasks. This business has a high mortality rate.

Why isn't Nero more affluent? Because of his trading style—or perhaps his personality. His risk aversion is extreme. Nero's objective is not to maximize his profits, so much as it is to avoid having this entertaining machine called trading taken away from him. Blowing up would mean

returning to the tedium of the university or the nontrading life. Every time his risks increase, he conjures up the image of the quiet hallway at the university, the long mornings at his desk spent in revising a paper, kept awake by bad coffee. No, he does not want to have to face the solemn university library where he was bored to tears. “I am shooting for longevity,” he is wont to say.

Nero has seen many traders *blow up,* and does not want to get into that situation. *Blow up* in the lingo has a precise meaning; it does not just mean to lose money; it means to lose more money than one ever expected, to the point of being thrown out of the business (the equivalent of a doctor losing his license to practice or a lawyer being disbarred). Nero rapidly exits trades after a predetermined loss. He never sells “naked options” (a strategy that would leave him exposed to large possible losses). He never puts himself in a situation where he can lose more than, say, $1 million—regardless of the probability of such an event. That amount has always been variable; it depends on his accumulated profits for the year. This risk aversion prevented him from making as much money as the other traders on Wall Street who are often called “Masters of the Universe.” The firms he has worked for generally allocate more money to traders with a different style from Nero, like John, whom we will encounter soon.

Nero’s temperament is such that he does not mind losing small change. “I love taking small losses,”he says. “I just need my winners to be large.” In no circumstances does he want to be exposed to those rare events, like panics and sudden crashes, that wipe a trader out in a flash. To the contrary, he wants to benefit from them. When people ask him why he does not hold on to losers, he invariably answers that he was trained by “the most chicken of them all,” the Chicago trader Stevo who taught him the business. This is not true; the real reason is his training in probability and his innate skepticism.

There is another reason why Nero is not as rich as others in his situation. His skepticism does not allow him to invest any of his own funds outside of treasury bonds. He therefore missed out on the great bull market. The reason he offers is that it could have turned out to be a bear market and a trap. Nero harbors a deep suspicion that the stock market is some form of an investment scam and cannot bring himself to

own a stock. The difference with people around him who were enriched by the stock market was that he was cash-flow rich, but his assets did not inflate at all along with the rest of the world (his treasury bonds hardly changed in value). He contrasts himself with one of those start-up technology companies that were massively cash-flow negative, but for which the hordes developed some infatuation. This allowed the owners to become rich from their stock valuation, and thus dependent on the randomness of the market's election of the winner. The difference with his friends of the investing variety is that he did not depend on the bull market, and, accordingly, does not have to worry about a bear market at all. His net worth is not a function of the investment of his savings—he does not want to depend on his investments, but on his cash earnings, for his enrichment. He takes not an inch of risk with his savings, which he invests in the safest possible vehicles. Treasury bonds are safe; they are issued by the United States government, and governments can hardly go bankrupt since they can freely print their own currency to pay back their obligation.

No Work Ethics

Today, at thirty-nine, after fourteen years in the business, he can consider himself comfortably settled. His personal portfolio contains several million dollars in medium-maturity Treasury bonds, enough to eliminate any worry about the future. What he likes most about proprietary trading is that it requires considerably less time than other high-paying professions; in other words it is perfectly compatible with his non-middle-class work ethic. Trading forces someone to think hard; those who merely work hard generally lose their focus and intellectual energy. In addition, they end up drowning in randomness; work ethics, Nero believes, draw people to focus on noise rather than the signal (the difference we established in Table P.1).

This free time has allowed him to carry on a variety of personal interests. As Nero reads voraciously and spends considerable time in the gym and museums, he cannot have a lawyer's or a doctor's schedule. Nero found the time to go back to the statistics department where he started his doctoral studies and finished the "harder science" doctorate in statistics, by rewriting his thesis in more concise terms. Nero now teaches, once a year, a half-semester seminar called *History*

of Probabilistic Thinking in the mathematics department of New York University, a class of great originality that draws excellent graduate students. He has saved enough to be able to maintain his lifestyle in the future and has contingency plans perhaps to retire into writing popular essays of the scientific-literary variety, with themes revolving around probability and *indeterminism*— but only if some event in the future causes the markets to shut down. Nero believes that risk-conscious hard work and discipline can lead someone to achieve a comfortable life with a very high probability. Beyond that, it is all randomness: either by taking enormous (and unconscious) risks, or by being extraordinarily lucky. Mild success can be explainable by skills and labor. Wild success is attributable to variance.

There Are Always Secrets

Nero's probabilistic introspection may have been helped out by a dramatic event in his life—one that he kept to himself. A penetrating observer might detect in Nero a measure of suspicious exuberance, an unnatural drive. For his life is not as crystalline as it may seem. Nero harbors a secret, one that will be discussed in time.

JOHN THE HIGH-YIELD TRADER

Through most of the 1990s, across the street from Nero's house stood John's—a much larger one. John was a high-yield trader, but he was not a trader in the style of Nero. A brief professional conversation with him would have revealed that he presented the intellectual depth and sharpness of mind of an aerobics instructor (though not the physique). A purblind man could have seen that John had been doing markedly better than Nero (or, at least, felt compelled to show it). He parked two top-of-the-line German cars in his driveway (his and hers), in addition to two convertibles (one of which was a collectible Ferrari), while Nero had been driving the same VW Cabriolet for almost a decade—and still does.

The wives of John and Nero were acquaintances, of the health-club type, but Nero's wife felt extremely uncomfortable in the company of John's. She felt that the lady was not merely trying to impress her, but was treating her like someone inferior. While Nero had become inured

to the sight of traders getting rich (and trying too hard to become sophisticated by turning into wine collectors and opera lovers), his wife had rarely encountered repressed new wealth—the type of people who have felt the sting of indigence at some point in their lives and want to get even by exhibiting their wares. The only dark side of being a trader, Nero often says, is the sight of money being showered on unprepared people who are suddenly taught that Vivaldi's *Four Seasons* is "refined" music. But it was hard for his spouse to be exposed almost daily to the neighbor who kept boasting of the new decorator they just hired. John and his wife were not the least uncomfortable with the fact that their "library" came with the leather-bound books (her health club reading was limited to *People* magazine but her shelves included a selection of untouched books by dead American authors). She also kept discussing unpronounceable exotic locations where they would repair during their vacations without so much as knowing the smallest thing about the places—she would have been hard put to explain on which continent the Seychelles Islands are located. Nero's wife is all too human; although she kept telling herself that she did not want to be in the shoes of John's wife, she felt as if she had been somewhat swamped in the competition of life. Somehow words and reason became ineffectual in front of an oversized diamond, a monstrous house, and a sports car collection.

An Overpaid Hick

Nero also suffered the same ambiguous feeling toward his neighbors. He was quite contemptuous of John, who represented about everything he is not and does not want to be—but there was the social pressure that was starting to weigh on him. In addition, he too would like to have sampled such excessive wealth. Intellectual contempt does not control personal envy. That house across the street kept getting bigger, with addition after addition—and Nero's discomfort kept apace. While Nero had succeeded beyond his wildest dreams, both personally and intellectually, he was starting to consider himself as having missed a chance somewhere. In the pecking order of Wall Street, the arrival of such types as John had caused him to be a significant trader no longer —but while he used to not care about this, John and his house and his cars had started to gnaw away at him. All would have been well if Nero had not had that stupid large house across the street judging him with a

superficial standard every morning. Was it the animal pecking order at play, with John's house size making Nero a beta male? Worse even, John was about five years his junior, and, despite a shorter career, was making at least ten times his income.

When they used to run into each other Nero had a clear feeling that John tried to put him down—with barely detectable but no less potent signs of condescension. Some days John ignored him completely. Had John been a remote character, one Nero could only read about in the papers, the situation would have been different. But there John was in flesh and bones and he was his neighbor. The mistake Nero made was to start talking to him, as the rule of pecking order immediately emerged. Nero tried to soothe his discomfort by recalling the behavior of Swann, the character in Proust's *In Search of Time Lost,* a refined art dealer and man of leisure who was at ease with such men as his personal friend the then Prince of Wales, but acted like he had to prove something in the presence of the middle class. It was much easier for Swann to mix with the aristocratic and well-established set of Guermantes than it was with the social-climbing one of the Verdurins, no doubt because he was far more confident in their presence. Likewise Nero can exact some form of respect from prestigious and prominent people. He regularly takes long meditative walks in Paris and Venice with an erudite Nobel Prize–caliber scientist (the kind of person who no longer has to prove anything) who actively seeks his conversation. A very famous billionaire speculator calls him regularly to ask him his opinion on the valuation of some derivative securities. But there he was obsessively trying to gain the respect of some overpaid hick with a cheap New Jersey "Noo-Joyzy" accent. (Had I been in Nero's shoes I would have paraded some of my scorn to John with the use of body language, but again, Nero is a nice person.)

Clearly, John was not as well educated, well bred, physically fit, or perceived as being as intelligent as Nero—but that was not all; he was not even as street-smart as him! Nero has met true street-smart people in the pits of Chicago who exhibit a rapidity of thinking that he could not detect in John. Nero was convinced that the man was a confident shallow-thinker who had done well because he never made an allowance for his vulnerability. But Nero could not, at times, repress his envy—he wondered whether it was an objective evaluation of John, or

if it was his feelings of being slighted that led him to such an assessment of John. Perhaps it was Nero who was not quite the best trader. Maybe if he had pushed himself harder or had sought the right opportunity—instead of "thinking," writing articles and reading complicated papers. Perhaps he should have been involved in the high-yield business, where he would have shined among those shallow-thinkers like John.

So Nero tried to soothe his jealousy by investigating the rules of pecking order. Psychologists have shown that most people prefer to make $70,000 when others around them are making $60,000 than to make $80,000 when others around them are making $90,000. Economics, schmeconomics, it is all pecking order, he thought. No such analysis could prevent him from assessing his condition in an absolute rather than a relative way. With John, Nero felt that, for all his intellectual training, he was just another one of those who would prefer to make less money provided others made even less.

Nero thought that there was at least a hint to support the idea of John being merely lucky—in other words Nero, after all, might not need to move away from his neighbor's starter palazzo. There was hope that John would meet his undoing. For John seemed unaware of one large hidden risk he was taking, the risk of blowup, a risk he could not see because he had too short an experience of the market (but also because he was not thoughtful enough to study history). How could John, with his coarse mind, otherwise be making so much money? This business of junk bonds depends on some knowledge of the "odds," a calculation of the probability of the rare (or random) events. What do such fools know about odds? These traders use "quantitative tools" that give them the odds—and Nero disagrees with the methods used. This high-yield market resembles a nap on a railway track. One afternoon, the surprise train would run you over. You make money every month for a long time, then lose a multiple of your cumulative performance in a few hours. He has seen it with option sellers in 1987, 1989, 1992, and 1998. One day they are taken off the exchange floors, accompanied by oversized security men, and nobody ever sees them again. The big house is simply a loan; John might end up as a luxury car salesman somewhere in New Jersey, selling to the new newly rich who no doubt would feel comfortable in his presence. Nero cannot blow

up. His less oversized abode, with its four thousand books, is his own. No market event can take it away from him. Every one of his losses is limited. His trader's dignity will never, never be threatened.

John, for his part, thought of Nero as a loser, and a snobbish overeducated loser at that. Nero was involved in a mature business. He believed that he was way over the hill. "These 'prop' traders are dying," he used to say. "They think they are smarter than everybody else, but they are passé."

THE RED-HOT SUMMER

Finally, in September 1998, Nero was vindicated. One morning while leaving to go to work he saw John in his front yard unusually smoking a cigarette. He was not wearing a business suit. He looked humble; his customary swagger was gone. Nero immediately knew that John had been fired. What he did not suspect was that John also lost almost everything he had. We will see more details of John's losses in Chapter 5 .

Nero felt ashamed of his feelings of Schadenfreude, the joy humans can experience upon their rivals' misfortunes. But he could not repress it. Aside from it being unchivalrous, it was said to bring bad luck (Nero is weakly superstitious). But in this case, Nero's merriment did not come from the fact that John went back to his place in life, so much as it was from the fact that Nero's methods, beliefs, and track record had suddenly gained in credibility. Nero would be able to raise public money on his track record precisely because such a thing could not possibly happen to him. A repetition of such an event would pay off massively for him. Part of Nero's elation also came from the fact that he felt proud of his sticking to his strategy for so long, in spite of the pressure to be the alpha male. It was also because he would no longer question his trading style when others were getting rich because they misunderstood the structure of randomness and market cycles.

Serotonin and Randomness

Can we judge the success of people by their raw performance and their personal wealth? Sometimes—but not always. We will see how, at any

point in time, a large section of businessmen with outstanding track records will be no better than randomly thrown darts. More curiously, and owing to a peculiar bias, cases will abound of the least-skilled businessmen being the richest. However, they will fail to make an allowance for the role of luck in their performance.

Lucky fools do not bear the slightest suspicion that they may be lucky fools—by definition, they do not know that they belong to such a category. They will act as if they deserved the money. Their strings of successes will inject them with so much serotonin (or some similar substance) that they will even fool themselves about their ability to outperform markets (our hormonal system does not know whether our successes depend on randomness). One can notice it in their posture; a profitable trader will walk upright, dominant style—and will tend to talk more than a losing trader. Scientists found out that serotonin, a neurotransmitter, seems to command a large share of our human behavior. It sets a positive feedback, the virtuous cycle, but, owing to an external kick from randomness, can start a reverse motion and cause a vicious cycle. It has been shown that monkeys injected with serotonin will rise in the pecking order, which in turn causes an increase of the serotonin level in their blood—until the virtuous cycle breaks and starts a vicious one (during the vicious cycle failure will cause one to slide in the pecking order, causing a behavior that will bring about further drops in the pecking order). Likewise, an increase in personal performance (regardless of whether it is caused deterministically or by the agency of Lady Fortuna) induces a rise of serotonin in the subject, itself causing an increase of what is commonly called “leadership” ability. One is “on a roll.” Some imperceptible changes in deportment, like an ability to express oneself with serenity and confidence, make the subject look credible—as if he truly deserved the shekels. Randomness will be ruled out as a possible factor in the performance, until it rears its head once again and delivers the kick that will induce the downward spiral.

A word on the display of emotions. Almost no one can conceal his emotions. Behavioral scientists believe that one of the main reasons why people become leaders is not from what skills they seem to possess, but rather from what extremely superficial impression they make on others through hardly perceptible physical signals—what we

call today “charisma,” for example. The biology of the phenomenon is now well studied under the subject heading “social emotions.” Meanwhile some historian will “explain” the success in terms of, perhaps, tactical skills, the right education, or some other theoretical reason seen in hindsight. In addition, there seems to be curious evidence of a link between leadership and a form of psychopathology (the sociopath) that encourages the non-blinking, self-confident, insensitive person to rally followers.

People have often had the bad taste of asking me in a social setting if my day in trading was profitable. If my father were there, he would usually stop them by saying “never ask a man if he is from Sparta: If he were, he would have let you know such an important fact—and if he were not, you could hurt his feelings.” Likewise, never ask a trader if he is profitable; you can easily see it in his gesture and gait. People in the profession can easily tell if traders are making or losing money; head traders are quick at identifying an employee who is faring poorly. Their face will seldom reveal much, as people consciously attempt to gain control of their facial expressions. But the way they walk, the way they hold the telephone, and the hesitation in their behavior will not fail to reveal their true disposition. On the morning after John had been fired, he certainly lost much of his serotonin—unless it was another substance that researchers will discover in another decade. One cab driver in Chicago explained to me that he could tell if traders he picked up near the Chicago Board of Trade, a futures exchange, were doing well. “They get all puffed up,” he said. I found it interesting (and mysterious) that he could detect it so rapidly. I later got some plausible explanation from evolutionary psychology, which claims that such physical manifestations of one’s performance in life, just like an animal’s dominant condition, can be used for signaling: It makes the winners seem easily visible, which is efficient in mate selection.

YOUR DENTIST IS RICH, VERY RICH

We close this chapter with a hint on the next discussion of resistance to randomness. Recall that Nero can be considered prosperous but not “very rich” by his day’s standards. However, according to some strange accounting measure we will see in the next chapter, he is extremely rich *on the average of lives* he could have led—he takes so little risk in his

trading career that there could have been very few disastrous outcomes. The fact that he did not experience John's success was the reason he did not suffer his downfall. He would be therefore wealthy according to this unusual (and probabilistic) method of accounting for wealth. Recall that Nero protects himself from the rare event. Had Nero had to relive his professional life a few million times, very few sample paths would be marred by bad luck—but, owing to his conservatism, very few as well would be affected by extreme good luck. That is, his life in stability would be similar to that of an ecclesiastic clock repairman. Naturally, we are discussing only his professional life, excluding his (sometimes volatile) private one.

Arguably, *in expectation,* a dentist is considerably richer than the rock musician who is driven in a pink Rolls Royce, the speculator who bids up the price of impressionist paintings, or the entrepreneur who collects private jets. For one cannot consider a profession without taking into account the average of the people who enter it, not the sample of those who have succeeded in it. We will examine the point later from the vantage point of the survivorship bias, but here, in Part I, we will look at it with respect to resistance to randomness.

Consider two neighbors, John Doe A, a janitor who won the New Jersey lottery and moved to a wealthy neighborhood, compared to John Doe B, his next-door neighbor of more modest condition who has been drilling teeth eight hours a day over the past thirty-five years. Clearly one can say that, thanks to the dullness of his career, if John Doe B had to relive his life a few thousand times since graduation from dental school, the range of possible out-comes would be rather narrow (assuming he is properly insured). At the best, he would end up drilling the rich teeth of the New York Park Avenue residents, while the worst would show him drilling those of some semideserted town full of trailers in the Catskills. Furthermore, assuming he graduated from a very prestigious teeth-drilling school, the range of out-comes would be even more compressed. As to John Doe A, if he had to relive his life a million times, almost all of them would see him performing janitorial activities (and spending endless dollars on fruitless lottery tickets), and one in a million would see him winning the New Jersey lottery.

The idea of taking into account both the observed and unobserved possible outcomes sounds like lunacy. For most people, probability is about what may happen in the future, not events in the observed past; an event that has already taken place has 100% probability, i.e., certainty. I have discussed the point with many people who platitudinously accuse me of confusing myth and reality. Myths, particularly well-aged ones, as we saw with Solon's warning, can be far more potent (and provide us with more experience) than plain reality.

Five

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SURVIVAL OF THE LEAST FIT—CAN EVOLUTION BE FOOLED BY RANDOMNESS?

A case study on two rare events. On rare events and evolution. How "Darwinism" and evolution are concepts that are misunderstood in the nonbiological world. Life is not continuous. How evolution will be fooled by randomness. A prolegomenon for the problem of induction.

CARLOS THE EMERGING-MARKETS WIZARD

I used to meet Carlos at a variety of New York parties, where he would show up impeccably dressed, though a bit shy with the ladies. I used to regularly pounce on him and try to pick his brains about what he did for a living, namely buying or selling emerging-market bonds. A nice gentleman, he complied with my requests, but tensed up; for him speaking English, in spite of his fluency, seemed to require some expenditure of physical effort that made him contract his head and neck muscles (some people are not made to speak foreign languages). What are emerging-market bonds? "Emerging market" is the politically correct euphemism to define a country that is not very developed (as a skeptic, I do not impart to their "emergence"such linguistic certainty).The bonds are financial instruments issued by these foreign governments, mostly Russia, Mexico, Brazil, Argentina, and Turkey. These bonds traded for pennies when these governments were not doing well. Suddenly investors rushed into these markets in the early 1990s and pushed the envelope further and further by acquiring increasingly more exotic securities. All these countries were building hotels where United States cable news channels were available, with health clubs equipped with treadmills and large-screen television sets that made them join the global village. They all had access to the same gurus and financial entertainers. Bankers would come to invest in their

bonds and the countries would use the proceeds to build nicer hotels so more investors would visit. At some point these bonds became the vogue and went from pennies to dollars; those who knew the slightest thing about them accumulated vast fortunes.

Carlos supposedly comes from a patrician Latin-American family that was heavily impoverished by the economic troubles of the 1980s, but, again, I have rarely run into anyone from a ravaged country whose family did not at some juncture own an entire province or, say, supply the Russian czar with sets of dominoes. After brilliant undergraduate studies, he went to Harvard to pursue a Ph.D. in economics, as it was the sort of thing Latin-American patricians had gotten into the habit of doing at the time (with a view to saving their economies from the evils of non-Ph.D. hands). He was a good student but could not find a decent thesis topic for his dissertation. Nor did he gain the respect of his thesis advisor, who found him unimaginative. Carlos settled for a master's degree and a Wall Street career.

The nascent emerging-market desk of a New York bank hired Carlos in 1992. He had the right ingredients for success; he knew where on the map to find the countries that issued "Brady bonds," dollar-denominated debt instruments issued by Less Developed Countries. He knew what Gross Domestic Product meant. He looked serious, brainy, and well-spoken, in spite of his heavy Spanish accent. He was the kind of person banks felt comfortable putting in front of their customers. What a contrast with the other traders who lacked polish!

Carlos got there right in time to see things happening in that market. When he joined the bank, the market for emerging-market debt instruments was small and traders were located in undesirable parts of trading floors. But the activity rapidly became a large, and growing, part of the bank's revenues.

He was generic among this community of emerging market traders; they are a collection of cosmopolitan patricians from across the emerging-market world that remind me of the international coffee hour at the Wharton School. I find it odd that rarely does a person specialize in the market of his or her birthplace. Mexicans based in London trade Russian securities, Iranians and Greeks specialize in Brazilian bonds,

and Argentines trade Turkish securities. Unlike my experience with real traders, they are generally urbane, dress well, collect art, but are nonintellectual. They seem too conformist to be true traders. They are mostly between thirty and forty, owing to the youth of their market. You can expect many of them to hold season tickets to the Metropolitan Opera. True traders, I believe, dress sloppily, are often ugly, and exhibit the intellectual curiosity of someone who would be more interested in the information-revealing contents of the garbage can than the Cézanne painting on the wall.

Carlos thrived as a trader-economist. He had a large network of friends in the various Latin-American countries and knew exactly what took place there. He bought bonds that he found attractive, either because they paid him a good rate of interest, or because he believed that they would become more in demand in the future, therefore appreciating in price. It would be perhaps erroneous to call him a *trader.* A trader buys and sells (he may sell what he does not own and buy it back later, hopefully making a profit in a decline; this is called “shorting”). Carlos just bought—and he bought in size. He believed that he was paid a good risk premium to hold these bonds because there was economic value in lending to these countries. Shorting, in his opinion, made no economic sense.

Within the bank Carlos was the emerging-markets reference. He could produce the latest economic figures at the drop of a hat. He had frequent lunches with the chairman. In his opinion, trading was economics, little else. It had worked so well for him. He got promotion after promotion, until he became the head trader of the emerging-market desk at the institution. Starting in 1995, Carlos did exponentially well in his new function, getting an expansion of his capital on a steady basis (i.e., the bank allocated a larger portion of its funds to his operation)—so fast that he was incapable of using up the new risk limits.

The Good Years

The reason Carlos had good years was not just because he bought emerging-market bonds and their value went up over the period. It was mostly because he also bought dips. He accumulated when prices

experienced a momentary panic. The year 1997 would have been bad had he not added to his position after the dip in October that accompanied the false stock market crash that took place then. Overcoming these small reversals of fortune made him feel invincible. He could do no wrong. He believed that the economic intuition he was endowed with allowed him to make good trading decisions. After a market dip he would verify the fundamentals, and, if they remained sound, he would buy more of the security and lighten up as the market recovered. Looking back at the emerging-market bonds between the time Carlos started his involvement with these markets and his last bonus check in December 1997, one sees an upward sloping line, with occasional blips, such as the Mexican devaluation of 1995, followed by an extended rally. One can also see some occasional dips that turned out to be "excellent buying opportunities."

It was the summer of 1998 that undid Carlos—that last dip did not translate into a rally. His track record up to that point included just one bad quarter—but bad it was. He had earned for his bank close to $80 million cumulatively in his previous years. He lost $300 million in just one summer. What happened? When the market started dipping in June, his friendly sources informed him that the sell-off was merely the result of a "liquidation" by a New Jersey hedge fund run by a former Wharton professor. That fund specialized in mortgage securities and had just received instructions to wind down the overall inventory. The inventory included some Russian bonds, mostly because *yield hogs,* as these funds are known, engage in the activity of building a "diversified" portfolio of high-yielding securities.

Averaging Down

When the market started falling, he accumulated more Russian bonds, at an average of around $52. That was Carlos' trait, average down. The problems, he deemed, had nothing to do with Russia, and it was not some New Jersey fund run by some mad scientist that was going to decide the fate of Russia. "Read my lips: It's a li-qui-dation!" he yelled at those who questioned his buying.

By the end of June, his trading revenues for 1998 had dropped from up $60 million to up $20 million. That made him angry. But he calculated

that should the market rise back to the pre–New Jersey sell-off, then he would be up $100 million. That was unavoidable, he asserted. These bonds, he said, would never, ever trade below $48. He was risking so little, to possibly make so much.

Then came July. The market dropped a bit more. The benchmark Russian bond was now at $43. His positions were underwater, but he increased his stakes. By now he was down $30 million for the year. His bosses were starting to become nervous, but he kept telling them that, after all, Russia would not go under. He repeated the cliché that it was too big to fail. He estimated that bailing them out would cost so little and would benefit the world economy so much that it did not make sense to liquidate his inventory now. “This is the time to buy, not to sell,” he said repeatedly. “These bonds are trading very close to their possible default value.” In other words, should Russia go into default, and run out of dollars to pay the interest on its debt, these bonds would hardly budge. Where did he get this idea? From discussions with other traders and emerging-market economists (or trader-economist hybrids). Carlos put about half his net worth, then $5 million, in the Russia Principal Bond. “I will retire on these profits,” he told the stockbroker who executed the trade.

Lines in the Sand

The market kept going through the lines in the sand. By early August, they were trading in the thirties. By the middle of August, they were in the twenties. And he was taking no action. He felt that the price on the screen was quite irrelevant in his business of buying “value.”

Signs of battle fatigue were starting to show in his behavior. Carlos was getting jumpy and losing some of his composure. He yelled at someone in a meeting: “Stop losses are for schmucks! I am not going to buy high and sell low!” During his string of successes he had learned to put down and berate traders of the non-emerging-market variety. “Had we gotten out in October 1997 after our heavy loss we would not have had those excellent 1997 results,” he was also known to repeat. He also told management: “These bonds trade at very depressed levels. Those who can invest now in these markets would realize wonderful returns.” Every morning, Carlos spent an hour discussing the situation with

market economists around the globe. They all seemed to present a similar story: This sell-off is overdone.

Carlos' desk experienced losses in other emerging markets as well. He also lost money in the domestic Russian Ruble Bond market. His losses were mounting, but he kept telling his management rumors about very large losses among other banks—larger than his. He felt justified to show that "he fared well relative to the industry."This is a symptom of systemic troubles; it shows that there was an entire community of traders who were conducting the exact same activity. Such statements, that other traders had also gotten into trouble, are self-incriminating. A trader's mental construction should direct him to do precisely *what other people do not do.*

Toward the end of August, the bellwether Russia Principal Bonds were trading below $10. Carlos' net worth was reduced by almost half. He was dismissed. So was his boss, the head of trading. The president of the bank was demoted to a "newly created position." Board members could not understand why the bank had so much exposure to a government that was not paying its own employees—which, disturbingly, included armed soldiers. This was one of the small points that emerging-market economists around the globe, from talking to each other so much, forgot to take into account. Veteran trader Marty O'Connell calls this the firehouse effect. He had observed that firemen with much downtime who talk to each other for too long come to agree on many things that an outside, impartial observer would find ludicrous (they develop political ideas that are very similar). Psychologists give it a fancier name, but my friend Marty has no training in behavioral sciences.

The nerdy types at the International Monetary Fund had been taken for a ride by the Russian government, which cheated on its account. Let us remember that economists are evaluated on how intelligent they sound, not on a scientific measure of their knowledge of reality. However, the price of the bonds was not fooled. It knew more than the economists, more than the Carloses of the emerging-market departments.

Louie, a veteran trader on the neighboring desk who suffered much humiliation by these rich emerging-market traders, was there,

vindicated. Louie was then a fifty-two-year-old Brooklyn-born-and-raised trader who over three decades survived every single conceivable market cycle. He calmly looked at Carlos being escorted by a security guard to the door like a captured soldier taken to the arena. He muttered in his Brooklyn accent: "*Economics Schmeconomics. It is all market dynamics.* "

Carlos is now out of the market. The possibility that history may prove him right (at some point in the future) has nothing to do with the fact that he is a bad trader. He has all of the traits of a thoughtful gentleman, and would be an ideal son-in-law. But he has most of the attributes of the bad trader. And, at any point in time, the richest traders are often the worst traders. This, I will call the *cross-sectional problem:* At a given time in the market, the most successful traders are likely to be those that are best fit to the latest cycle. This does not happen too often with dentists or pianists—because these professions are more immune to randomness.

JOHN THE HIGH-YIELD TRADER

We met John, Nero's neighbor, in Chapter 1 . At the age of thirty-five he had been on Wall Street as a corporate high-yield bonds trader for seven years, since his graduation from Pace University's Lubin School of Business. He rose to head up a team of ten traders in record time—thanks to a jump between two similar Wall Street firms that afforded him a generous profit-sharing contract. The contract allowed him to be paid 20% of his profits, as they stood at the end of each calendar year. In addition, he was allowed to invest his own personal money in his trades—a great privilege.

John is not someone who can be termed as principally intelligent, but he was believed to be endowed with a good measure of business sense. He was said to be "pragmatic" and "professional." He gave the impression that he was born a businessperson, never saying anything remotely unusual or out of place. He remained calm in most circumstances, rarely betraying any form of emotion. Even his occasional cursing (this is Wall Street!) was so much in context that it sounded, well, professional.

John dressed impeccably. This was in part due to his monthly trips to London where his unit had a satellite supervising European high-yield activities. He wore a Savile Row tailored dark business suit, with a Ferragamo tie—enough to convey the impression that he was the epitome of the successful Wall Street professional. Each time Nero ran into him he came away feeling poorly dressed.

John's desk engaged principally in an activity called "high-yield" trading, which consisted in acquiring "cheap" bonds that yielded, say, 10%, while the borrowing rate for his institution was 5.5%. It netted a 4.5% revenue, also called *interest rate differential*— which seemed small except that he could leverage himself and multiply such profit by the leverage factor. He did this in various countries, borrowing at the local rate and investing in "risky" assets. It was easy for him to amass over $3 billion dollars in face value of such trade across a variety of continents. He hedged the interest rate exposure by selling U.S., U.K., French, and other government bond futures, thus limiting his bet to the differential between the two instruments. He felt protected by this hedging strategy—cocooned (or so he thought) against those nasty fluctuations in the world's global interest rates.

The Quant Who Knew Computers and Equations

John was assisted by Henry, a foreign quant whose English was incomprehensible, but who was believed to be at least equally competent in risk-management methods. John knew no math; he relied on Henry. "His brains and my business sense," he was wont to say. Henry supplied him with risk assessments concerning the overall portfolio. Whenever John felt worried, he would ask Henry for another freshly updated report. Henry was a graduate student in Operations Research when John hired him. His specialty was a field called Computational Finance, which, as its name indicates, seems to focus solely on running computer programs overnight. Henry's income went from $50,000 to $600,000 in three years.

Most of the profit John generated for the institution was not attributable to the interest rate differential between the instruments described above. It came from the changes in the value of the securities John held, mostly because many other traders were acquiring them to imitate

John's trading strategy (thus causing the price of these assets to rise). The interest rate differential was getting closer to what John believed was "fair value." John believed that the methods he used to calculate "fair value" were sound. He was backed by an entire department that helped him analyze and determine which bonds were attractive and offered capital appreciation potential. It was normal for him to be earning these large profits over time.

John made steady income for his employers, perhaps even better than steady. Every year the revenues he generated almost doubled as compared to the previous year. During his last year, his income experienced a quantum leap as he saw the capital allocated to his trades swell beyond his wildest expectations. His bonus check was for $10 million (pretax, which would generate close to a $5 million total tax bill). John's personal net worth reached $1 million at the age of thirty-two. By the age of thirty-five it had exceeded $16 million. Most of it came from the accumulation of bonuses—but a sizeable share came from profits on his personal portfolio. Of the $16 million, about $14 million he insisted in keeping invested in his business. They allowed him, thanks to the leverage (i.e., use of borrowed money), to keep a portfolio of $50 million involved in his trades, with $36 million borrowed from the bank. The effect of the leverage is that a small loss would be compounded and would wipe him out.

It took only a few days for the $14 million to turn into thin air—and for John to lose his job at the same time. As with Carlos, it all happened during the summer of 1998, with the meltdown of high-yield bond values. Markets went into a volatile phase during which nearly everything he had invested in went against him *at the same time.* His hedges no longer worked out. He was mad at Henry for not having figured out that these events could happen. Perhaps there was a bug in the program.

His reaction to the first losses was, characteristically, to ignore the market. "One would go crazy if one were to listen to the mood swings of the market," he said. What he meant by that statement was that the "noise" was mean reverting, and would likely be offset by "noise" in the opposite direction. That was the translation in plain English of what

Henry explained to him. But the “noise” kept adding up in the same direction.

As in a biblical cycle, it took seven years to make John a hero and just seven days to make him a failure. John is now a pariah; he is out of a job and his telephone calls are not returned. Many of his friends were in the same situation. How? With all that information available to him, his perfect track record (and therefore, in his eyes, an above-average intelligence and skill-set), and the benefit of sophisticated mathematics, how could he have failed? Is it perhaps possible that he forgot about the shadowy figure of randomness?

It took a long time for John to figure out what had happened, owing to the rapidity with which the events unfolded and his state of shellshock. The dip in the market was not very large. It was just that his leverage was enormous. What was more shocking for him was that all their calculations gave the event a probability of 1 in 1,000,000,000,000,000,000,000,000 years. Henry called that a “ten sigma” event. The fact that Henry doubled the odds did not seem to matter. It made the probability 2 in 1,000,000,000,000,000,000,000,000 years.

When will John recover from the ordeal? Probably never. The reason is not because John lost money. Losing money is something good traders are accustomed to. It is because he blew up; he lost more than he planned to lose. His personal confidence was wiped out. But there is another reason why John may never recover. The reason is that John was never skilled in the first place. He is one of those people who happened to be there when it all happened. He may have looked the part but there are plenty of people who look the part.

Following the incident, John regarded himself “ruined”; yet his net worth is still close to $1 million, which could be the envy of more than 99.9% of the inhabitants of our planet. Yet there is a difference between a wealth level reached from *above* and a wealth reached from *below.* The road from $16 million to $1 million is not as pleasant as the one from 0 to $1 million. In addition, John is full of shame; he still worries about running into old friends on the street.

His employer should perhaps be most unhappy with the overall outcome. John pulled some money out of the episode, the $1 million he had saved. He should be thankful that the episode did not cost him anything—except the emotional drain. His net worth did not become negative. That was not the case for his last employer. John had earned for the employers, New York investment banks, around $250 million in the course of the seven years. He lost more than $600 million for his last employer in barely a few days.

The Traits They Shared

The reader needs to be warned that not all of the emerging-market and high-yield traders talk and behave like Carlos and John. Only the most successful ones, alas, or perhaps those who were the most successful during the 1992–1998 bull cycle.

At their age, both John and Carlos still have the chance to make a career. It would be wise for them to look outside of their current profession. The odds are that they will not survive the incident. Why? Because by discussing the situation with each of them, one can rapidly see that they share the traits of the *acute successful randomness fool* who, in addition, operates in the most random of environments. What is more worrisome is that their bosses and employers shared the same trait. They, too, are permanently out of the market. We will see throughout this book what characterizes the trait. Again, there may not be a clear definition for it, but you can recognize it when you see it. No matter what John and Carlos do, they will remain fools of randomness.

A REVIEW OF MARKET FOOLS
OF RANDOMNESS CONSTANTS

Most of the traits partake of the same Table P.1 right column–left column confusion; how they are fooled by randomness. Below is a brief outline of them:

An overestimation of the accuracy of their beliefs in some measure, either economic (Carlos) or statistical (John) . They never considered

that the fact that trading on economic variables has worked in the past may have been merely coincidental, or, perhaps even worse, that economic analysis was fit to past events to mask the random element in it. Consider that of all the possible economic theories available, one can find a plausible one that explains the past, or a portion of it. Carlos entered the market at a time when it worked, but he never tested for periods when markets did the opposite of sound economic analysis. There were periods when economics failed traders, and others when it helped them.

The U.S. dollar was overpriced (i.e., the foreign currencies were undervalued) in the early 1980s . Traders who used their economic intuitions and bought foreign currencies were wiped out. But later those who did so got rich (members of the first crop were bust). It is random! Likewise, those who shorted Japanese stocks in the late 1980s suffered the same fate—few survived to recoup their losses during the collapse of the 1990s. Toward the end of the last century there was a group of operators called “macro” traders who dropped like flies, with, for instance, “legendary”(rather, lucky) investor Julian Robertson closing shop in 2000 after having been a star until then. Our discussion of survivorship bias will enlighten us further, but, clearly, there is nothing less rigorous than their seemingly rigorous use of economic analyses to trade.

A tendency to get married to positions . There is a saying that bad traders divorce their spouse sooner than abandon their positions. Loyalty to ideas is not a good thing for traders, scientists—or anyone.

The tendency to change their story . They become investors “for the long haul” when they are losing money, switching back and forth between traders and investors to fit recent reversals of fortune. The difference between a trader and an investor lies in the duration of the bet, and the corresponding size. There is absolutely nothing wrong with

investing “for the long haul,” provided one does not mix it with short-term trading—it is just that many people become long-term investors after they lose money, postponing their decision to sell as part of their denial.

No precise game plan ahead of time as to what to do in the event of losses . They simply were not aware of such a possibility. Both bought more bonds after the market declined sharply, but not in response to a predetermined plan.

Absence of critical thinking expressed in absence of revision of their stance with “stop losses.” Middlebrow traders do not like selling when it is “even better value.” They did not consider that perhaps their method of determining value is wrong, rather than the market failing to accommodate their measure of value. They may be right, but, perhaps, some allowance for the possibility of their methods being flawed was not made. For all his flaws, we will see that Soros seems rarely to examine an unfavorable outcome without testing his own framework of analysis.

Denial . When the losses occurred there was no clear acceptance of what had happened. The price on the screen lost its reality in favor of some abstract “value.” In classic denial mode, the usual “this is only the result of liquidation, distress sales” was proffered. They continuously ignored the message from reality.

How could traders who made every single mistake in the book become so successful? Because of a simple principle concerning randomness. This is one manifestation of the survivorship bias. We tend to think that traders were successful *because* they are good. Perhaps we have turned the causality on its head; we consider them good just because

they make money. One can make money in the financial markets totally out of randomness.

Both Carlos and John belong to the class of people who benefited from a market cycle. It was not merely because they were involved in the right markets. It was because they had a bent in their style that closely fitted the properties of the rallies experienced in their market during the episode. They were *dip buyers.* That happened, in hindsight, to be the trait that was the most desirable between 1992 and the summer of 1998 in the specific markets in which the two men specialized. Most of those who happened to have that specific trait, over the course of that segment of history, dominated the market. Their score was higher and they replaced people who, perhaps, were better traders.

NAIVE EVOLUTIONARY THEORIES

The stories of Carlos and John illustrate how bad traders have a short- and medium-term survival advantage over good traders. Next we take the argument to a higher level of generality. One must be either blind or foolish to reject the theories of Darwinian self-selection. However, the simplicity of the concept has drawn segments of amateurs (as well as a few professional scientists) into blindly believing in continuous and infallible Darwinism in all fields, which includes economics.

The biologist Jacques Monod bemoaned a couple of decades ago that everyone believes himself an expert on evolution (the same can be said about the financial markets); things have gotten worse. Many amateurs believe that plants and animals reproduce on a one-way route toward perfection. Translating the idea in social terms, they believe that companies and organizations are, thanks to competition (and the discipline of the quarterly report), irreversibly heading toward betterment. The strongest will survive; the weakest will become extinct. As to investors and traders, they believe that by letting them compete, the best will prosper and the worst will go learn a new craft (like pumping gas or, sometimes, dentistry).

Things are not as simple as that. We will ignore the basic misuse of Darwinian ideas in the fact that organizations do not reproduce like living members of nature—Darwinian ideas are about reproductive fitness, not about survival. The problem comes, as everything else in this book, from randomness. Zoologists found that once randomness is injected into a system, the results can be quite surprising: What seems to be an evolution may be merely a diversion, and possibly regression. For instance, Steven Jay Gould (who was accused of being more of a popularizer than a genuine scientist) found ample evidence of what he calls "genetic noise," or "negative mutations," thus incurring the wrath of some of his colleagues (he took the idea a little too far). An academic debate ensued, plotting Gould against colleagues like Dawkins who were considered by their peers as better trained in the mathematics of randomness. Negative mutations are traits that survive in spite of being worse, from the reproductive fitness standpoint, than the ones they replaced. However, they cannot be expected to last more than a few generations (under what is called temporal aggregation).

Furthermore, things can get even more surprising when randomness changes in shape, as with regime switches. A regime switch corresponds to situations when all of the attributes of a system change to the point of its becoming unrecognizable to the observer. Darwinian fitness applies to species developing over a very long time, not observed over a short term—time aggregation eliminates much of the effects of randomness; things (I read *noise*) balance out over the long run, as people say.

Owing to the abrupt rare events, we do not live in a world where things "converge" continuously toward betterment. Nor do things in life move *continuously* at all. The belief in continuity was ingrained in our scientific culture until the early twentieth century. It was said that *nature does not make jumps;* people quote this in well-sounding Latin: *Natura non facit saltus.* It is generally attributed to the eighteenth-century botanist Linnaeus who obviously got it all wrong. It was also used by Leibniz as a justification for calculus, as he believed that things are continuous no matter the resolution at which we look at them. Like many well-sounding "make sense" types of statements (such dynamics made perfect intellectual sense), it turned out to be entirely wrong, as it was denied by quantum mechanics. We discovered that, in the very

small, particles jump (discretely) between states; they do not slide between them.

Can Evolution Be Fooled by Randomness?

We end this chapter with the following thought. Recall that someone with only casual knowledge about the problems of randomness would believe that an animal is at the maximum fitness for the conditions of its time. This is not what evolution means; *on average,* animals will be fit, but not every single one of them, and not at all times. Just as an animal could have survived because its sample path was lucky, the "best" operators in a given business can come from a subset of operators who survived because of overfitness to a sample path—a sample path that was free of the evolutionary rare event. One vicious attribute is that the longer these animals can go without encountering the rare event, the more vulnerable they will be to it. We said that should one extend time to infinity, then, *by ergodicity,* that event will happen with certainty—the species will be wiped out! For evolution means fitness to one and only one time series, not the average of all the possible environments.

By some viciousness of the structure of randomness, a profitable person like John, someone who is a pure loser in the long run and correspondingly unfit for survival, presents a high degree of eligibility in the short run and has the propensity to multiply his genes. Recall the hormonal effect on posture and its signaling effect to other potential mates. His success (or pseudosuccess owing to its fragility) will show in his features as a beacon. An innocent potential mate will be fooled into thinking (unconditionally) that he has a superior genetic makeup, until the following rare event. Solon seems to have gotten the point; but try to explain the problem to a naive business Darwinist—or your rich neighbor across the street.

Eight

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TOO MANY MILLIONAIRES NEXT DOOR

Three illustrations of the survivorship bias. Why very few people should live on Park Avenue. The millionaire next door has very flimsy clothes. An overcrowding of experts.

HOW TO STOP THE STING OF FAILURE

Somewhat Happy

M arc lives on Park Avenue in New York City with his wife, Janet, and their three children. He makes $500,000 a year, give or take a boom or a recession—he does not believe that the recent spurt in prosperity is here to last and has not mentally adjusted yet to his recent abrupt rise in income. A rotund man in his late forties, with spongy features that make him look ten years older than his age, he leads the seemingly comfortable (but heckled) life of a New York City lawyer. But he is on the quiet side of Manhattan residents. Marc is clearly not the man one would expect to go bar-hopping or attend late-night Tribeca and SoHo parties. He and his wife have a country house and a rose garden and tend to be concerned, like many people of their age, mentality, and condition, with (in the following order) material comfort, health, and status. Weekdays, he does not come home until at least 9:30 p.m. and, at times, he can be found in the office at close to midnight. By the end of the week, Marc is so fatigued that he falls asleep during their three-hour drive to “the house”; and Marc spends most of Saturday lying in bed recovering and healing.

Marc grew up in a small town in the Midwest, the son of a quiet tax accountant who worked with sharp yellow pencils. His obsession with sharpness was so strong that he carried a sharpener in his pocket at all times. Marc exhibited very early signs of intelligence. He did extremely well in high school. He attended Harvard College, then Yale Law

School. Not bad, one would say. Later his career took him to corporate law, where he started working on large cases for a prestigious New York law firm, with barely enough hours left for him to brush his teeth. This is not too much an exaggeration, for he ate almost all of his dinners in the office, accumulating body fat and Brownie points toward his partnership. He later became a partner within the usual seven years, but not without the usual human costs. His first wife (whom he met in college) left him, as she was tired of an absentee lawyer husband and weary of the deterioration in his conversation—but, ironically, she ended up moving in with and later marrying another New York lawyer, probably with a no-less-flat conversation, but who made her happier.

Too Much Work

Marc's body became progressively flabbier, and his bespoke suits needed periodic visits to the tailor, in spite of his occasional crash diets. After he got over the depression of the abandonment, he started dating Janet, his paralegal, and promptly married her. They had three children in quick succession, bought the Park Avenue apartment, and the country house.

Janet's immediate acquaintance is composed of the other parents of the Manhattan private school attended by their children, and their neighbors at the co-operative apartment building where they live. From a materialistic standpoint, they come at the low end of such a set, perhaps even at the exact bottom. They would be the poorest of these circles, as their co-op is inhabited by extremely successful corporate executives, Wall Street traders, and high-flying entrepreneurs. Their children's private school harbors the second set of children of corporate raiders, from their trophy wives—perhaps even the third set, if one takes into account the age discrepancy and the model-like features of the other mothers. By comparison, Marc's wife, Janet, like him, presents a homely country-home-with-a-rose-garden type of appearance.

You're a Failure

Marc's strategy of staying in Manhattan may be rational, as his demanding work hours would make it impossible for him to commute. But the costs on his wife, Janet, are monstrous. Why? Because of their relative nonsuccess—as geographically defined by their Park Avenue neighborhood. Every month or so, Janet has a crisis, giving in to the strains and humiliations of being snubbed by some other mother at the school where she picks up the children, or another woman with larger diamonds by the elevator of the co-op where they live in the smallest type of apartments (the G line). Why isn't her husband so successful? Isn't he smart and hardworking? Didn't he get close to 1600 on the SAT? Why is this Ronald Something, whose wife never even nods to Janet, worth hundreds of millions, when her husband went to Harvard and Yale and has such a high IQ and has hardly any substantial savings?

We will not get too involved in the Chekhovian dilemmas in the private lives of Marc and Janet, but their case provides a very common illustration of the emotional effect of *survivorship bias.* Janet feels that her husband is a failure, by comparison, but she is miscomputing the probabilities in a gross manner—she is using the wrong distribution to derive a rank. As compared to the general U.S. population, Marc has done very well, better than 99.5% of his compatriots. As compared to his high school friends, he did extremely well, a fact that he could have verified had he had time to attend the periodic reunions, and he would come at the top. As compared to the other people at Harvard, he did better than 90% of them (financially, of course). As compared to his law school comrades at Yale, he did better than 60% of them. But as compared to his co-op neighbors, he is at the bottom! Why? Because he chose to live among the people who have been successful, in an area that excludes failure. In other words, those who have failed do not show up in the sample, thus making him look as if he were not doing well at all. By living on Park Avenue, one does not have exposure to the losers, one only sees the winners. As we are cut to live in very small communities, it is difficult to assess our situation outside of the narrowly defined geographic confines of our habitat. In the case of Marc and Janet, this leads to considerable emotional distress; here we have a woman who married an extremely successful man but all she can see is comparative failure, for she cannot emotionally compare him to a sample that would do him justice.

Aside from the misperception of one's performance, there is a social treadmill effect: You get rich, move to rich neighborhoods, then become poor again. To that add the psychological treadmill effect; you get used to wealth and revert to a set point of satisfaction. This problem of some people never really getting to feel satisfied by wealth (beyond a given point) has been the subject of technical discussions on happiness.

Someone would rationally say to Janet: "Go read this book *Fooled by Randomness* by one mathematical trader on the deformations of chance in life; it would give you a statistical sense of perspective and would accordingly make you feel better." As an author, I would like to offer a panacea for $14.95, but I would rather say that in my best hopes it may provide an hour or so of solace. Janet may need something more drastic for relief. I have repeated that becoming more rational, or not feeling emotions of social slights, is not part of the human race, at least not with our current biology. There is no solace to be found from reasoning—as a trader I have learned something about these unfruitful efforts to reason against the grain. I would advise Janet to move out, and go live in some blue-collar neighborhood where they would feel less humiliated by their neighbors and rise in the pecking order beyond their probability of success. They could use the deformation in the opposite direction. If Janet cares about status, then I would even recommend some of these large housing blocks.

DOUBLE SURVIVORSHIP BIASES

More Experts

I recently read a bestseller called *The Millionaire Next Door,* an extremely misleading (but almost enjoyable) book by two "experts," in which the authors try to infer some attributes that are common to rich people. They examined a collection of currently wealthy people and found out that these are unlikely to lead lavish lives. They call such people the accumulators; persons ready to postpone consumption in order to amass funds. Most of the appeal of the book comes from the simple but counterintuitive fact that these are less likely to look like very rich people—it clearly costs money to look and behave rich, not to count the time demands of spending money. Leading prosperous lives is time-consuming—shopping for trendy clothes, becoming conversant

in Bordeaux wines, getting to know the expensive restaurants. All these activities can put high demands on one's time and divert the subject from what should be the real preoccupation, namely the accumulation of nominal (and paper) wealth. The moral of the book is that the wealthiest are to be found among those less suspected to be wealthy. On the other hand, those who act and look wealthy subject their net worth to such a drain that they inflict considerable and irreversible damage to their brokerage account.

I will set aside the point that I see no special *heroism* in accumulating money, particularly if, in addition, the person is foolish enough to not even try to derive any tangible benefit from the wealth (aside from the pleasure of regularly counting the beans). I have no large desire to sacrifice much of my personal habits, intellectual pleasures, and personal standards in order to become a billionaire like Warren Buffett, and I certainly do not see the point of becoming one if I were to adopt Spartan (even miserly) habits and live in my starter house. Something about the praise lavished upon him for living in austerity while being so rich escapes me; if austerity is the end, he should become a monk or a social worker—we should remember that becoming rich is a purely selfish act, not a social one. The virtue of capitalism is that society can take advantage of people's greed rather than their benevolence, but there is no need to, in addition, extol such greed as a moral (or intellectual) accomplishment (the reader can easily see that, aside from very few exceptions like George Soros, I am not impressed by people with money). Becoming rich is not directly a moral achievement, but that is not where the severe flaw in the book lies.

As we saw, the heroes of *The Millionaire Next Door* are the accumulators, people who defer spending in order to invest. It is undeniable that such strategy might work; money spent bears no fruit (except the enjoyment of the spender). But the benefits promised in the book seem grossly overstated. A finer read of their thesis reveals that their sample includes a double dose of survivorship bias. In other words, it has two compounding flaws.

Visibility Winners

The first bias comes from the fact that the rich people selected for their sample are among the lucky monkeys on typewriters. The authors made no attempt to correct their statistics with the fact that they saw only the winners. They make no mention of the “accumulators” who have accumulated the wrong things (members of my family are experts on that; those who accumulated managed to accumulate currencies about to be devalued and stocks of companies that later went bust). Nowhere do we see a mention of the fact that some people were lucky enough to have invested in the winners; these people no doubt would make their way into the book. There is a way to take care of the bias: Lower the wealth of your average millionaire by, say, 50%, on the grounds that the bias causes the average net worth of the observed millionaire to be higher by such amount (it consists in adding the effect of the losers into the pot). It would certainly modify the conclusion.

It’s a Bull Market

As to the second, more serious flaw, I have already discussed the problem of induction. The story focuses on an unusual episode in history; buying its thesis implies accepting that the current returns in asset values are permanent (the sort of belief that prevailed before the great crash that started in 1929). Remember that asset prices have (still at the time of writing) witnessed the greatest bull market in history and that values did compound astronomically during the past two decades. A dollar invested in the average stock would have grown almost twenty-fold since 1982—and that is the average stock. The sample might include people who invested in stocks performing better than average. Virtually all of the subjects became rich from asset price inflation, in other words from the recent inflation in financial paper and assets that started in 1982. An investor who engaged in the same strategy during less august days for the market would certainly have a different story to tell. Imagine the book being written in 1982, after the prolonged erosion of the inflation-adjusted value of the stocks, or in 1935, after the loss of interest in the stock market.

Or consider that the United States stock market is not the only investment vehicle. Consider the fate of those who, in place of spending their money buying expensive toys and paying for ski trips, bought Lebanese lira denominated Treasury bills (as my grandfather did), or

junk bonds from Michael Milken (as many of my colleagues in the 1980s did). Go back in history and imagine the accumulator buying Russian Imperial bonds bearing the signature of Czar Nicholas II and trying to accumulate further by cashing them from the Soviet government, or Argentine real estate in the 1930s (as my great-grandfather did).

The mistake of ignoring the survivorship bias is chronic, even (or perhaps especially) among professionals. How? Because we are trained to take advantage of the information that is lying in front of our eyes, ignoring the information that we do not see. At the time of writing, pension funds and insurance companies in the United States and in Europe somehow bought the argument that "in the long term equities *always* pay off 9%" and back it up with statistics. The statistics are right, but they are past history. My argument is that I can find you a security somewhere among the 40,000 available that went up twice that amount every year without fail. Should we put the social security money into it?

A brief summing up at this point: I showed how we tend to mistake one realization among all possible random histories as the most representative one, forgetting that there may be others. In a nutshell, the survivorship bias implies that *the highest performing realization will be the most visible.* Why? Because the losers do not show up.

A GURU'S OPINION

The fund management industry is populated with gurus. Clearly, the field is randomness-laden and the guru is going to fall into a trap, particularly if he has no proper training in inference. At the time of writing, there is one such guru who developed the very unfortunate habit of writing books on the subject. Along with one of his peers, he computed the success of a "Robin Hood" policy of investing with the least successful manager in a given population of managers. It consists in switching down by taking money away from the winner and allocating it to the loser. This goes against the prevailing wisdom of investing with a winning manager and taking away money from a losing one. Doing so, their "paper strategy" (i.e., as in a Monopoly game, not executed in real life) derived considerably higher returns than if they stuck to the

winning manager. Their hypothetical example seemed to them to prove that one should not stay with the best manager, as we would be inclined to do, but rather switch to the worst manager, or at least such seems to be the point they were attempting to convey.

Their analysis presents one severe hitch that any graduate student should be able to pinpoint at the first reading. Their sample only had *survivors.* They simply forgot to take into account the managers who went out of business. Such a sample includes managers that were operating during the simulation, and *are still operating today.* True, their sample included managers who did poorly, but only those managers who did poorly and recovered, without getting out of business. So it would be obvious that investing with those who fared poorly at some point but recovered (with the benefit of hindsight) would yield a positive return! Had they continued to fare poorly, they would be out of business and would not be included in the sample.

How should one conduct the proper simulation? By taking a population of managers in existence, say, five years ago and running the simulation up to today. Clearly, the attributes of those who leave the population are biased toward failure; few successful people in such a lucrative business call it quits because of extreme success. Before we turn to a more technical presentation of these issues, one mention of the much idealized buzzword of optimism. Optimism, it is said, is predictive of success. Predictive? It can also be predictive of failure. Optimistic people certainly take more risks as they are overconfident about the odds; those who win show up among the rich and famous, others fail and disappear from the analyses. Sadly.