

Božo Stojanović

Faculty of Economics,
University of Belgrade,
Serbia

✉ bstojanovic@ekof.bg.ac.rs

The Consequences of the Unpredictable and the Unexpected

The Black Swan - The Impact of the Highly Improbable

by **Nassim Nicholas Taleb**

Naklada Jesenski i Turk, Zagreb, 2009.

I.

The latest financial crisis was not only an unexpected, it was at the same time a very unpleasant event for a wide circle of people who have been affected directly or indirectly (whose property melted rapidly almost overnight), but also a great challenge for all those working in the field for economic theory. This was particularly a challenge for those involved in financial economics. This field of economic science has been very popular and profitable in recent decades (and therefore very challenging) for young, capable and ambitious people. In addition to economists, this field attracted many experts from the natural sciences, particularly mathematicians and physicists. There was, according to the global trend, an increase in the mathematization of economics in almost all of its fields, and a high degree of formalization of this theory. Things have, technically speaking, gone so far that this field of economics soon became understandable only to a small circle of specialists. This has had both academic and practical consequences. Complex mathematical models have created a feeling of ruthless scientificity and certainty of the predictions ("mathematics doesn't lie"), as well as intellectual prestige for those who handle them. On the other hand, such models were used as a base on which business decisions with long-term consequences were founded (there were truly high stakes in the game). Everything seemed to be perfect and was functioning smoothly and to the satisfaction of a large number of market participants (as measured by the amount of salary). And then suddenly a crisis erupted and everything collapsed like a sandcastle. Panic, disbelief and shock followed.

With the outbreak of the crisis, in addition to many other difficult questions, a question arises whether the existing financial theory (one that is dominant in the academic world and on the basis of which a hierarchy in the scientific community has been built for decades) is at all relevant in order to understand the actual functioning of financial markets, and whether its predictions of events and processes in the (uncertain) future, are something to be taken seriously and used as the basis for concrete business decisions? This is usually a much deeper issue and it also challenges the fundamentals of contemporary economics. Specifically, the crisis has raised the issue

of whether the dominant economic theory is a satisfactory explanation of how the real market works? In his book, which was published in English a few years ago, Nassim Nicholas Taleb¹, answers the aforementioned question negatively and succinctly states: the preeminent science (not only economic science) that attempts to "tame uncertainty" shows poor results. Why? It is blind for large deviations – the black swans.

The Black Swan is an event which is rare (unpredictable) and unexpected. Or, according to Taleb, a black swan is a combination of low predictability (due to our fallacy on the likelihood of surprise) and strong influence. Seen from another angle, the black swan is something which is highly expected and which did not happen. Black swans can be explained, but always afterwards. Examples of black swans are: the Internet, World War I, a personal computer, the September 11 attacks in the U.S. and the like. Taleb points out that all that surrounds us and what is important for people's lives is subject to the dynamics of the black swan. The fact that people tend to behave like a black swan doesn't exist adds extra difficulty to the whole thing.

It is necessary, before moving on to greater presentation of the basic argumentation that supports the thesis set forth, to point out that this is a book written by a great connoisseur. Nassim Taleb (a self-described empirical sceptic, antidogmatic and obsessive empiricist) is not a pompous amateur who wants to get attention with big words and shocking statements, but someone who is well versed in financial theory (he has a Ph.D. in the field of quantitative finance, specifically in the field of derivatives) and practice (he worked at the stock exchange for years). Let us also mention the fact that Taleb taught the application of the theory of probability in risk management. All in all, this is a man whose arguments should be taken seriously and carefully reviewed.

Although this book reflects the original idea, or as the author himself says there are no recycled or re-packaged other people's thoughts, the list of references is very impressive. There are, among others, books on economic theory, behavioural economics, financial economics, philosophy and the philosophy of science, mathematics, statistics, decision theories, psychology and experimental psychology. Such conceptual richness, e.g. the broad consultation of the results from many disciplines, is in line with his fundamental belief that scholarship without erudition can easily lead to disaster.

II.

In the pages of this well conceived and skilfully rendered book, Taleb explains why we are not able to successfully predict future events. First, he elaborates the central ideas and the basic arguments in a form acceptable to a wide range of readers, and

¹ It is hard to describe Nasim Nicholas Taleb (1960) in one sentence (polyglot, epistemologist, financial expert, essayist, university professor). He worked at the stock exchange and taught at prestigious universities (among other things, he taught the science of uncertainty). In addition to numerous scholarly articles and essays, and the book *Hedging: Managing Vanilla and Exotic Options* (1997), in 2001, he published the book *Fooled by Randomness. Hidden Role of Chance in the Markets and Life* which quickly became a bestseller and was translated into dozen languages (second edition was published in 2005). Last year he published his book *The Bed of Procrustus: Philosophical and Practical Aphorisms*.

then actually raises it to a higher analytical level. It is necessary to emphasize, at the very beginning that Taleb does not question the knowledge as such, but points to a dangerous gap between what people actually know and what they think (or pretend) to know. Human thought suffers from "the illusion of understanding": everyone thinks they know what is happening in the world (which is much more complex than imagined); therefore a misconception that they are able to predict successfully arises. Black swan emerges precisely in the gap between what people actually know and what they think they know.

In this context, the big problem is the so-called narrative fallacy. It is a striking weakness of human interpretation and tendency to favour compact stories rather than the raw truth (facts and figures). Among other things, the problem is the fact that we are not able to predict atypical events. All who claim that they are, according to Taleb's opinion are charlatans and that they are not to be trusted (the fact that even if they were awarded the Nobel Prize for Economics changes nothing). Taleb points out to the need of people for a fact they can cling on while trying to understand the events that surround them. This fact often has nothing to do with the processes that they seek to understand, but people still cling to it. They needed it as an anchor, e.g. support and landmark.

The so-called retrospective distortion is in force: evaluating things only when they already occurred, and this causes different events to be shown in a distorted way (it is necessary to learn - which is not that simple - to distinguish between looking ahead and subsequent intelligence). When things are evaluated subsequently, that is, when they have already occurred, then the past makes seem much clearer (more settled and predictable) than it really was. Distorted interpretation and expectations based arising from it, which concern the processes that will unfold in the future are the source of future black swans.

Taleb also points out the confirmation bias. People tend to seek only those examples that confirm their story and their vision of the world, and that denigrate or completely ignore by those which prove otherwise. There is also a striking asymmetry in the perception of the outcome of complex events. The fact is that success is generally attributed to their own skills and abilities (which are always overestimated), and failure to events that we have no influence on and to free us of any responsibility. All this results not only in distorted perceptions of the world but also in their perception of their own forecasting abilities.

Since we are not able to face real uncertainty we transform into a form, which enables managing. We are forced to reduce the dimensions of the content in order to be able to absorb them. In addition, if the dimensions are larger, they are harder to define, and with the narrowing process, there is more order and less space is left to chance. Such a process leads to the misconception that the world is much better organized than it really is. The black swan slipped away from this simplification process.

Taleb speaks about the ludic misconception as well. Namely, it is a fact that what is taught in colleges as uncertainty is far from the uncertainty that is encountered in real life: "The properties of uncertainty with which we encounter in real life they have almost nothing to do with sterilized uncertainty with which we encounter

in exams and games" (p. 195). The measurable (in terms of Frank H. Knight's concept) risk, doesn't exist in real life, it's just a "laboratory fabrication." According to the Taleb this is nerdy uncertainty. In his opinion uncertainty should be treated only as a lack of knowledge, that is, directly opposed to knowledge. Therefore, one is wise, if he knows that he is unable to see things in the distance.

Acceptance of any observations from the past as definitive and representative for the future is the key cause of our inability to understand the black swans. To illustrate, after the financial crisis analysts always thoroughly investigate the events that have occurred, arguing that it is good preparation for the new breakdown. In addition, it is overlooked that even the previous failure had no earlier precedent. So it is really just a response to clearly defined sources of uncertainty, but black swans remain unaffected. They are smiling safely and waiting for their moment.

III.

Taleb especially criticizes the famous Gaussian bell curve (normal distribution). It, completely groundless though, assures us that we are able to "tame the uncertainty." This is nothing but, according to the author, a great intellectual fraud. The key problem is that this curve ignores large deviations - black swans. As we go further away from the average, the odds of large deviations are exponentially decreasing. Atypical values are highly improbable, and therefore can be ignored. Such a conclusion, as Nicholas Taleb says, is a dangerous misconception when it comes to the real world. Measures of uncertainty that are based on the normal distribution neglect the possibility and impact of discontinuity and great jumps. The problem arises when this distribution is applied to situations that are qualitatively different and where their use is inappropriate. The Gaussian curve is useful in those situations where we have variables whose maximum values slightly deviates from the average. The Gaussian curve, the author concludes, "sucks coincidence" from real-life and turns it into something it is not.

It is necessary to be more specific here. Taleb talks about two different worlds: Mediocristan and Extremistan. In the first world, when we have a sufficiently large sample at disposal, there is no individual case that will significantly change the whole or the total value. Therefore, extreme variations can be rejected. Specifically, a single occurrence does not affect the whole, and after certain observation, we can "find out what happens." In that world events are allocated (distributed) in accordance to the normal distribution. In Mediocristan, the problem of black swans either does not exist or is insignificant. Taleb notes that those people who have undergone conventional statistical education, think they live in Mediocristan by default. Only in this world, as Taleb argues, concepts such as standard deviation, correlation, regression are meaningful.

On the other hand, in Extremistan, extreme variations cannot be dismissed. In this system, the inequalities are such that the whole or the total value may be affected by a single measured value. The problem is that this impact may be disproportionate. Taleb illustrates this with an example. Take a thousand random people and analyze that set according to the net assets of members. Then add Bill Gates to the set. The situation will change drastically. His wealth will actually represent over 99 percent of

the group's wealth, and other wealth will be at the level of rounding error. In Extremistan, a typical representative doesn't exist. The most typical are "dwarfs" or "giants". Unlike Mediocristan where winners receive only a small piece of the whole cake, in Extremistan, the rules of the game are such that the winner takes almost all. Extremistan is can produce black swans. In this world, we should be suspicious of the knowledge that is based on data. Specifically, in such circumstances it is difficult to predict the future on the basis of past data.

By comparing processes in these two worlds, Taleb concludes: "In Mediocristan, we are forced to suffer the tyranny of the collective, routine, obvious and anticipated. In Extremistan we are subjected to the tyranny of single, random, unseen and unforeseen and" (pp. 76-77). That is where the black swans expect us. Of course, one should not hastily conclude that every event in Extremistan is necessarily a black swan. Predictable events which are scientifically arable exist in this world as well. Extremistan will not go away, so it will take some getting used to it and the best possible way to adjust to it.

All social issues, explains Taleb, originate from Extremistan. Taleb believes that almost everything in society is the product of a few rare shocks and jumps. Atypical rather than "normal" events are often more important for their understanding. On the other hand, studies of social life generally focus on the "normal", using methods that are based on the normal distribution. Almost nothing relevant can be concluded from such a procedure. Taleb highly appreciates Popper's (Karl R. Popper) position on the functional and incurable unpredictability of the world. The inability to predict atypical events as a result has the inability to predict the flow of history. History and society are progressing in leaps and historians and forecasters like to believe in small and gradual progress.

IV.

Taleb speaks about epistemological arrogance and divides it into two categories: arrogance in the presence of specific competence and arrogance with complete incompetence. Taleb accordingly, plays with notions of experts and expertise. Apparently, he believes that the terms of expertise and knowledge should not be used lightly or trusted unreservedly. Why? In some areas there are real experts, but there are areas in which self-proclaimed "experts" most often are not. The author states: "Our inability to predict areas susceptible to the Black swan, in conjunction with the general lack of awareness of this state of affairs, means that some professionals, who are considered experts, are actually not" (p. 19).

According to his opinion (and he claims that he came to it through personal experience in contact with experts and "experts"), among those who are usually not experts (although they regard themselves as such) are economists, financial forecasters, professors of finance, experts in political science, "risk experts", employees at the Bank for International Settlements, financial advisors. Next to them are the brokers, clinical psychologists, judges, advisors, experts in human resources, intelligence analysts. Among those who he regards as experts (the list is not complete) are the: cattle examiners, astronomers, test pilots, chess masters, physicists, mathematicians (if they do not deal with empirical problems), accountants. People are, Taleb

adds, naturally inclined to listen to the experts, even in those areas where there are no experts.

Special topic of this book is the implicit and explicit criticism of the dominance of economic theory (especially its prediction), e.g. the theories that dominate the universities and the scientific community. Among other things it is based on the concept of balance and rational behavior. And rationality (maximizing behavior) and balance are closely linked with uncertainty (they imply its absence). In a world where uncertainty reigns, both rationality and market equilibrium are losing ground. The economic science is, according to the author full of nerds - people who think too conventionally (and fundamentally wrong). He considers Samuelson (Paul A. Samuelson), Hicks (John R. Hicks), Arrow (Kenneth J. Arrow) and Debreu (Gerard Debreu) to be the great sinners in economics. All of them were awarded with the Nobel Prize in economics. With their work and enormous prestige and influence they have taken the economic science of the right course. They gave it a false aura of scientificity (technical rigor), and at the expense of applicability. Namely, Taleb believes that they create a fictional world that they are able to fit into mathematics, but the problem is that these models are not applicable because of excessive abstraction. Therefore, Taleb suggests caution when it comes to academic economists and also adds: "If you hear from the mouth of any reputable economist words balance or normal distribution, do not engage in debate. Just ignore them or try to put a mouse down their neck" (p. 308).

Taleb accuses economists (this word is often put in quotation marks) of Platonism: the situation when we think we understand more than we really do. It is when we take the understanding of what we know too serious and neglecting black swans. The particular problem in economy is that the forecast implies the prediction of how people will behave in the future. Neoclassicism (the dominant economic paradigm) assumes that they will behave rationally, which means they will behave predictable. In this concept, rationality is described as the maximizing behavior, which is reduced to optimization in different contexts. Taleb believes this procedure has no practical significance, but it serves only for the economists to compete for the position in the academic hierarchy. By studying economic papers (in order to test the ability of economists to predict) Taleb has concluded the following: "None of them provide convincing evidence for the claim that economists, as a community, have the ability to predict and that - even if they possess such skills all that such skills - their predictions are, at best only slightly better than guessing, that is, they are not sufficiently reliable for making serious decisions" (p. 233). The economists are good at predicting the usual, but fail in predicting the unusual. They keep missing the black swans.

Particular subjects of criticism are the experts in financial markets. In this context, Taleb singles out Markowitz (Harry Markowitz) and Sharp (William Sharp), who have founded their models on the "Gaussian foundations". All models, including these, neglect or minimize those influences and events that are not included in the model. Although this theory did not contribute to the understanding of the real world, in a brief period of time it was widely accepted and developed. The aforementioned authors were awarded with the Nobel Prize for Economics. It seemed that uncertainty was successfully overcome, or at least brought under control. Experience has shown

the completely opposite: a company which was using their expertise went bankrupt. Taleb insists on the thesis that this was the case of intellectual fraud clothed in the mantle of complex mathematics that silenced all those who objected or expressed even the mildest doubt. These people were branded as ignorant and hopeless "in the circles of wise men". Taleb has observed the following: "By convincing themselves that this is a great science, they made fools of the entire financial establishment. One of the biggest losses in the history of stock trading, happened in a blink of an eye, without any warning" (p. 87).

Taleb mentions only a few names of people he considers to be real economists: Bastiat (Frédéric Bastiat), Hayek (Friedrich von Hayek), Shackle (George L. S. Shackle), Minsky (Hyman Minsky), and Keynes (John M. Keynes). These are the authors who consistently emphasize the existence of fundamental uncertainty when economic events and processes in question. Among other things, Taleb reminds us of Bastiat's book *What is seen and what is not seen* where the author points out the limitations of interventionist measures. He stressed that one should not only look at the positive effects of some measures ("what is seen"), but we should bear in mind all the other consequences ("what is not seen"). Politicians usually emphasize the positive effects (and they are usually related to a particular social group), a keep quiet about negative consequences which will affect the society as a whole. This is about keeping silent about consequences of the suppression of information that is invisible at first sight. Friedrich von Hayek has titled his address when he was awarded with the Nobel Prize in economics "The illusion of knowledge". In it he explained the necessity for economy, in all its ambition, to reduce down to a reasonable extent, that is, not to promise anything it is not able to realize. He was actually sending across a message instructing economists to forget their planning ambitions.

Nassim Taleb believes that the strategy used by the researchers and entrepreneurs, is not the one described in the dominant economic theory. In a world where there are black swans, it is pointless to act as if they do not exist or to try to predict them. Maximum improvisation is needed and also the ability to recognize opportunities when they occur. In his opinion, free markets do not work by rewarding and encouraging skills. On the contrary, they work because they allow a person to try that is to let them get lucky.

V.

Does all of this lead to the conclusion that there is no need for prediction and that in fact every human action is meaningless and doomed to failure? No, says Taleb, you just need to approach things in a different way. For example, Taleb explains that we should keep away from the scalable and scalable professions. It is a profession where the rewards are not dependent on the amount of work. In these occupations there is a huge disparity between effort and reward. In occupations that are not scalable, you do not depend on the black swan (basically in the long-run you move above the average). On the other hand, scalable professions are good only if you are successful. They create extreme differences; few take almost everything, while others remain empty-handed. The scalable occupations have no average, there are only a few "giants" and a huge number of "dwarfs".

Taleb suggests avoiding major subjects, that is, all those things that can permanently jeopardize the future. Allow yourself, says Taleb, to be cheated in small things, but not in big things. It is necessary to learn how to rank the opinions and according to the damage they can cause and not according to their credibility. Taleb also proposes the following: Learn to differentiate between positive and negative random events, don't look for the accurate and local (in other words, do not be petty), seize every opportunity or anything that looks like an opportunity (this is something the entrepreneurs should particularly bear in mind); keep away from precise plans of the state.

He, himself proposed a combination of hyper-conservativity and hyper-aggression as a successful strategy against the black swan on the financial market. Part of the money (from 85 to 90 percent) should be invested in very secure financial instruments such as treasury bills. The rest should be invested in extremely speculative stakes (there are some technical details of this procedure but this point they are irrelevant). So, instead of a moderate, the investor is exposed on one hand to no, and on the other to very high risk. The average will be medium risky but will be a positive exposure to the black swan.

Taleb points out that there is nothing usual in the future. Those dealing with social sciences must constantly keep this fact on their mind. He says that despite the progress we have made and the increased amount of knowledge, the future will be more and more unpredictable. Chance is always something you do not know. Therefore, referencing to coincidence means to reference to ignorance. Scientists should therefore not be ashamed or try to mask ignorance. The increasing complexity of the world to which man has contributed by his actions dramatically reduces the gains from modeling and forecasting. The importance of the black swan is becoming more and more significant.

VI.

The book *The Black Swan* drew the attention of scientists and the general public and provoked many reactions in a short period of time. Some accepted it wholeheartedly while others criticized it severely (few were indifferent about it). The fact that it has been translated into dozens of languages accounts for its planetary popularity. There are also some reviews which consider it one of the most influential books in social sciences since the Second World War. This is a brilliant book that upsets and provokes, and especially ruthlessly mocks false knowledge which together with intellectual arrogance causes catastrophic consequences.

Although it deals with an extremely complex subject, Nasim Taleb's book is written amazingly simple and in a tone that greatly differs from the usual tone of academic debate (at times and with great humor). Taleb often combines rigorous analysis of the problems with interesting autobiographical elements, which gives special tone to the presentation and makes the text more interesting. As rightly pointed out by an analyst with regards to this book, it itself is an example of the black swan.

This is a book all those working in the field of social sciences, especially those who make predictions should read. It will certainly leave them thinking.