

# Song of the Black Swan

**Nassim Nicholas Taleb**<sup>1</sup>

*begs for common sense in the face of unpredictable financial markets.*

After completing my book *The Black Swan*, I spent some time meditating on the fragility of systems with the illusion of stability. This convinced me that the banking system was the mother of all accidents waiting to happen. I explained in the book that the best teachers of wisdom are the eldest, because they may have picked up invisible tricks that are absent from our epistemic routines and which help them survive in a world more complex than the one we think we understand. So being old implies a higher degree of resistance to “Black Swans” (events with the following three attributes: they lie outside the realm of regular expectations; they carry an extreme impact; and human nature makes us concoct explanations for their occurrence after the fact).

Take Mother Nature, which is clearly a complex system, with webs of interdependence, nonlinearities and robust ecology (otherwise it would have blown up a long time ago). It is a very old person with an impeccable memory. Mother nature does not develop Alzheimer’s – and there is evidence that even humans would not easily lose brain functions with age if they took long walks, avoided sugar, bread, white rice and stock-market investments, and refrained from taking economics classes or reading *The New York Times*.

Let me summarise my ideas of how Mother Nature deals with the Black Swan. First, she likes redundancies. Look at the human body. We have two eyes, two lungs, two kidneys, even two brains (with the possible exception of company executives) – and each has more capacity than is needed ordinarily. So redundancy equals insurance, and the apparent inefficiencies are associated with the costs of maintaining these spare parts and the energy needed to keep them around in spite of their idleness.

The exact opposite of redundancy is naïve optimisation. The reason I tell people to avoid attending an (orthodox) economics class and argue that economics will fail us is the following : economics is largely based on notions of naïve optimisation, mathematised (poorly) by Paul Samuelson – and these mathematics have contributed hugely to the construction of an error-prone society. An economist would find it inefficient to carry two lungs and two kidneys – consider the costs involved in transporting these heavy items across the savannah. Such optimisation would, eventually, kill you, after the first accident or the first outlier. Also, consider that if we gave Mother Nature to economists, it would dispense with individual kidneys – since we do not need them all the time, it would be “more

---

<sup>1</sup> **Nassim Nicholas Taleb** is a distinguished professor of risk engineering at the Polytechnic Institute of New York University and a former derivatives trader of CS-First Boston.

efficient” if we sold ours and used a central kidney on a time-share basis. You could also lend your eyes at night, since you do not need them to dream.

Almost every major idea in conventional economics fails under the modification of some assumption, or what is called perturbation, where you change one parameter or take a parameter henceforth assumed to be fixed and stable by the theory, and make it random. Take the notion of comparative advantage, supposedly discovered by David Ricardo, and which has oiled the wheels of globalisation. The idea is that countries should focus on “what they do best”. So one country should specialise in wine, another in clothes, even though one of them might be better at both. But consider what would happen to the country if the price of wine fluctuated. A simple perturbation around this assumption leads one to reach the opposite conclusion to Ricardo. Mother Nature does not like overspecialisations, as it limits evolution and weakens the animals.

This explains why I found the current ideas on globalisation (such as those promoted by the journalist Thomas Friedman) too naïve, and too dangerous for society – unless one takes into account the side effects. Globalisation might give the appearance of efficiency, but the operating leverage and the degrees of interaction between parts will cause small cracks in one spot to percolate through the entire system.

The same idea applies to debt: it makes you very fragile under perturbations. We currently learn in business schools to engage in borrowing, against all historical traditions (all Mediterranean cultures developed over time a dogma against debt). *Felix qui nihil debet*, goes the Roman proverb: “Happy is he who owes nothing.” Grandmothers who survived the Great Depression would have advised doing the exact opposite of getting into debt: have several years of income in cash before any personal risk-taking. Had the banks done the same, and kept high cash reserves, while taking more aggressive risks with a small portion of their portfolios, there would have been no crisis.

**“The challenge is to ensure that human mistakes and miscalculations remain confined and to avoid them spreading through the system”**

Documents dating back to the Babylonians show the ills of debt, and Near Eastern Religions banned it. This tells me that one of the purposes of religious traditions has been to enforce prohibitions to protect people against their own epistemic arrogance. Why? Debt implies a strong statement about the future, and a high degree of reliance on forecasts. If you borrow \$100 and invest in a project, you still owe \$100 even if you fail in the project (but you do a lot better in case you succeed). So debt is dangerous if you are overconfident about the future and are Black Swan-blind – which we all tend to be. And forecasting is harmful since people (especially governments) borrow in response to a forecast (or use the

forecast as a cognitive excuse to borrow). My “Scandal of Prediction” (bogus predictions that seem to be there to satisfy psychological needs) is compounded by the “Scandal of Debt”: borrowing makes you more vulnerable to forecast error.

Just as Mother Nature likes redundancies, so she abhors everything that is too big. The largest land animal is the elephant, and there is a reason for that. If I went on a rampage and shot an elephant, I might be put in jail and get yelled at by my mother, but I would hardly disturb the ecology of Mother Nature. On the other hand, my point about banks in my book – and if you shot a large bank, I would “shiver at the consequences” and that “if one falls, they all fall” – was subsequently illustrated by events: one bank failure, Lehman Brothers, in September 2008, brought down the entire edifice.

The crisis of 2008 provides an illustration of the need for robustness. Over the past 2500 years of recorded ideas, only fools and Platonists have believed in engineered utopias. We shouldn't think that we can correct mistakes and eliminate randomness from social and economic life. The challenge, rather, is to ensure that human mistakes and miscalculations remain confined and to avoid them spreading through the system – just the way Mother Nature does it. Reducing randomness increases exposure to Black Swans.

My dream is to have a true epistemocracy; that is, a society robust against expert errors, forecasting errors and hubris, one that can be resistant to incompetence of politicians, regulators, economists, central bankers, bankers, policy wonks and epidemiologists. Here are 10 principles for a Black Swan-robust society:

- What is fragile should break early while it's still small: Nothing should ever become too big to fail. Evolution in economic life helps those with the maximum amount of hidden risks become the biggest.
- No socialisation of losses and privatisation of gains: Whatever may need to be bailed out should be nationalised; whatever does not need a bailout should be free, small and risk bearing. We got ourselves into the worst capitalism and socialism. In France in the 1980s, the Socialists took over the banks. In the US in the 2000s the banks took over the government. This is surreal.
- People who drove a school bus blindfolded (and crashed it) should never be given a new bus: The economics establishment lost its legitimacy with the failure of the system in 2008. Find the smart people whose hands are clean to get us out of this mess.
- Don't let someone making an incentive bonus manage a nuclear plant – or your financial risks: Odds are he would cut every corner of safety to show profits from these savings while claiming to be conservative. Bonuses don't accommodate the hidden risks of

blow-ups. It is the symmetry of the bonus system that got us here. No incentive without disincentives.

- Compensate complexity with simplicity: Complexity from globalisation and highly networked economic life needs to be countered by simplicity in financial products. Complex systems survive thanks to slack and redundancy, no debt and optimisation.
- Do not give children sticks of dynamite, even if they come with a warning label: Complex financial products need to be banned because nobody understands them, and few are rational enough to know it. We need to protect citizens from themselves, from bankers selling them hedging products, and from gullible regulators who listen to economic theorists.
- Only Ponzi schemes should depend on confidence: Governments should never need to restore confidence. Cascading rumours are a product of complex systems. Governments cannot stop the rumours. We just need to be able to shrug off rumours, to be robust to them.
- Do not give an addict more drugs if they have withdrawal pains: Using leverage to cure the problems are too much leverage is not homoeopathy, it's denial. The debt crisis is not a temporary problem, it's a structural one. We need rehab.
- Citizens should not depend on financial assets as a repository of value and rely on fallible so-called expert advice from their retirement: economic life should be definancialised. We should learn not to use markets as warehouses of value.
- Make an omelette with the broken eggs: The crisis of 2008 was not a problem to fix with makeshift repairs. We will have to remake the system before it does so itself. Let us move voluntarily into a robust economy by helping what needs to be broken break on its own, converting debt into equity, marginalising the economics and business school establishments, banning leveraged buyouts, putting bankers where they belong, clawing back the bonuses of those who got us here and teaching people to navigate a world with fewer certainties. Then we will see an economic life closer to our biological environment: smaller firms and no leverage – a world in which entrepreneurs, not bankers, take the risks, and in which companies are born and die every day without making the news.<sup>2</sup>

---

<sup>2</sup> This article is extracted from the postscript to *The Black Swan: the Impact of the Highly Improbable*, by Nassim Nicholas Taleb, Penguin, 2008.