# The Black Swan of Cairo

## How Suppressing Volatility Makes the World Less Predictable and More Dangerous

*Nassim Nicholas Taleb and Mark Blyth*

Why is surprise the permanent condition of the U.S. political and economic elite? In 2008, when the global financial system imploded, the cry that no one could have seen this coming was heard everywhere, despite the existence of numerous analyses showing that a crisis was unavoidable. It is no surprise that one hears precisely the same response today regarding the current turmoil in the Middle East. The critical issue in both cases is the artificial suppression of volatility—the ups and downs of life—in the name of stability. It is both misguided and dangerous to push unobserved risks further into the statistical tails of the probability distribution of outcomes and allow these high-impact, low-probability "tail risks" to disappear from policymakers' fields of observation. What the world is witnessing in Tunisia, Egypt, and Libya is simply what happens when highly constrained systems explode.

Complex systems that have artificially suppressed volatility tend to become extremely fragile, while at the same time exhibiting no visible risks. In fact, they tend to be too calm and exhibit minimal variability as silent risks accumulate beneath the surface. Although the stated intention of political leaders and economic policymakers is to stabilize the system by inhibiting fluctuations, the result tends to be the opposite. These artificially constrained systems become prone to "Black Swans"—that is, they become extremely vulnerable to large-scale events that lie far from the statistical norm and were largely unpredictable to a given set of observers.

Such environments eventually experience a massive blowup, catching everyone off-guard and undoing years of stability or, in some cases, ending up far worse than they were in their initial volatile state. Indeed, the longer it takes

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for the blowup to occur, the worse the resulting harm in both economic and political systems.

Seeking to restrict variability seems to be good policy (who does not prefer stability to chaos?), so it is with very good intentions that policymakers unwittingly increase the risk of major blowups. And it is the same misperception of the properties of natural systems that led to both the economic crisis of 2007–8 and the current turmoil in the Arab world. The policy implications are identical: to make systems robust, all risks must be visible and out in the open—*fluctuat nec mergitur* (it fluctuates, but does not sink) goes the Latin saying.

Just as a robust economic system is one that encourages early failures (the concepts of fail small and fail fast), the U.S. government should stop supporting dictatorial regimes for the sake of pseudostability, and instead allow political noise to rise to the surface. Making an economy robust in the face of business swings requires allowing risk to be visible; the same is true in politics.

#### SEDUCED BY STABILITY

Both the recent financial crisis and the current political crisis in the Middle East are grounded in the rise of complexity, interdependence, and unpredictability. Economic policymakers in the United Kingdom and the United States have long promoted policies aimed at eliminating fluctuation—no more booms and busts in the economy, no more "Iranian surprises" in foreign policy. These policies have almost always produced undesirable outcomes. For example, the U.S. banking system became very fragile following a succession of progressively larger bailouts and government interventions, particularly after the 1983 rescue of major banks (ironically, by the same Reagan administration that trumpeted free markets). Promoting these bad policies has been a bipartisan effort throughout. Republicans have been good at fragilizing large corporations through bailouts, and Democrats have been good at fragilizing the government. At the same time, the financial system as a whole exhibited little volatility; it kept getting weaker while providing policymakers with the illusion of stability, illustrated most notably when Ben Bernanke, who was then a member of the Board of Governors of the Federal Reserve, declared the era of "the great moderation" in 2004.

Putatively independent central bankers fell into the same trap. During the 1990s, U.S. Federal Reserve Chair Alan Greenspan wanted to iron out the economic cycle's booms and busts, and he sought to control economic swings with interest-rate reductions at the slightest sign of a downward tick in the economic data. Furthermore, he adapted his economic policy to guarantee bank rescues, with implicit promises of a backstop—the now infamous "Greenspan put." These policies proved to have grave delayed side effects. Washington stabilized the market with bailouts and by allowing certain companies to grow "too big to fail". Because policymakers believed it was better to do something than to do nothing, they felt obligated to heal the economy rather than wait and see if it healed on its own.

The foreign policy equivalent is to support the incumbent no matter what. And just as banks took wild hidden risks thanks to Greenspan's implicit insurance

policy, client governments such as Hosni Mubarak's in Egypt for years engaged in overt plunder thanks to similarly reliable U.S. support.

Those who seek to prevent volatility on the grounds that any and all bumps in the road must be avoided paradoxically increase the probability that a tail risk will cause a major explosion. Consider as a thought experiment a man placed in an artificially sterilized environment for a decade and then invited to take a ride on a crowded subway; he would be expected to die quickly. Likewise, preventing small forest fires can cause larger forest fires to become devastating. This property is shared by all complex systems.

In the realm of economics, price controls are designed to constrain volatility on the grounds that stable prices are a good thing. But although these controls might work in some rare situations, the long-term effect of any such system is an eventual and extremely costly blowup whose cleanup costs can far exceed the benefits accrued. The risks of a dictatorship, no matter how seemingly stable, are no different, in the long run, from those of an artificially controlled price.

Such attempts to institutionally engineer the world come in two types: those that conform to the world as it is, and those that attempt to reform the world. The nature of humans, quite reasonably, is to intervene in an effort to alter their world and the outcomes it produces. But government interventions are laden with unintended—and unforeseen—consequences, particularly in complex systems, so humans must work with nature by tolerating systems that absorb human imperfections rather than seek to change them.

Take, for example, the recent celebrated documentary on the financial crisis, *Inside Job*, which blames the crisis on the malfeasance and dishonesty of bankers and the incompetence of regulators. Although it is morally satisfying, the film naively overlooks the fact that humans have always been dishonest and regulators have always been behind the curve. The only difference this time around was the unprecedented magnitude of the hidden risks and a misunderstanding of the statistical properties of the system.

What is needed is a system that can prevent the harm done to citizens by the dishonesty of business elites; the limited competence of forecasters, economists, and statisticians; and the imperfections of regulation, not one that aims to eliminate these flaws. Humans must try to resist the illusion of control: just as foreign policy should be intelligence-proof (it should minimize its reliance on the competence of information-gathering organizations and the predictions of "experts" in what are inherently unpredictable domains), the economy should be regulator-proof, given that some regulations simply make the system itself more fragile. Due to the complexity of markets, intricate regulations simply serve to generate fees for lawyers and profits for sophisticated derivatives traders who can build complex financial products in order to derive profits by skirting those regulations.

### DON'T BE A TURKEY

The life of a turkey before Thanksgiving is illustrative: the turkey is fed for 1,000 days and every day seems to confirm that the farmer cares for it—until the last day,

when confidence is maximal. The "turkey problem" occurs when a naive analysis of stability is derived from the absence of past variations. Likewise, confidence in stability was maximal at the onset of the financial crisis in 2007.

The turkey problem for humans is the result of mistaking one environment for another. Humans simultaneously inhabit two systems: the linear and the complex. The linear domain is characterized by its predictability and the low degree of interaction among its components, which allows the use of mathematical methods that make forecasts reliable. In complex systems, there is an absence of visible causal links between the elements, masking a high degree of interdependence and extremely low predictability. Nonlinear elements are also present, such as those commonly known, and generally misunderstood, as "tipping points." Imagine someone who keeps adding sand to a sand pile without any visible consequence, until suddenly the entire pile crumbles. It would be foolish to blame the collapse on the last grain of sand rather than the structure of the pile, but that is what people do consistently, and that is the policy error.

U.S. President Barack Obama may blame an intelligence failure for the government's not foreseeing the revolution in Egypt (just as former U.S. President Jimmy Carter blamed an intelligence failure for his administration's not foreseeing the 1979 Islamic Revolution in Iran), but it is the suppressed risk in the statistical tails that matters—not the failure to see the last grain of sand. As a result of complicated interdependence and contagion effects, in almost all complex systems, a small number of possible events dominate, namely, Black Swans.

Engineering, architecture, astronomy, most of physics, and much of common science are linear domains. The complex domain is the realm of the social world, epidemics, and economics. Crucially, the linear domain delivers mild variations without large shocks, whereas the complex domain delivers massive jumps and gaps. Complex systems are misunderstood, mostly because humans' sophistication, obtained over the history of human knowledge in the linear domain, does not transfer properly to the complex domain. Humans can predict a solar eclipse and the trajectory of a space vessel, but not the stock market or Egyptian political events. All complex systems have commonalities and even universalities. Sadly, deceptive calm (followed by Black Swan surprises) seems to be one of those properties.

#### THE ERROR OF PREDICTION

As with a crumbling sand pile, it would be foolish to attribute the collapse of a fragile bridge to the last truck that crossed it, and even more foolish to try to predict in advance which truck might bring it down. The system is responsible, not the components. But after the crisis of 2007–8, many people thought that predicting the subprime meltdown would have helped. It would not have, since it was a symptom of the crisis, not its underlying cause. Likewise, Obama's blaming "bad intelligence" for his administration's failure to predict the crisis in Egypt is symptomatic of both the misunderstanding of complex systems and the bad policies involved.

Obama's mistake illustrates the illusion of local causal chains—that is, con-

fusing catalysts for causes and assuming that one can know which catalyst will produce which effect. The final episode of the upheaval in Egypt was unpredictable for all observers, especially those involved. As such, blaming the CIA is as foolish as funding it to forecast such events. Governments are wasting billions of dollars on attempting to predict events that are produced by complex systems and are therefore not statistically understandable at the individual level.

As Mark Abdollahian of Sentia Group, one of the contractors who sell predictive analytics to the U.S. government, noted regarding Egypt, policymakers should "think of this like Las Vegas. In blackjack, if you can do four percent better than the average, you're making real money." But the analogy is spurious. There is no "four percent better" on Egypt. This is not just money wasted but the construction of a false confidence based on an erroneous focus. It is telling that the intelligence analysts made the same mistake as the risk-management systems that failed to predict the economic crisis—and offered the exact same excuses when they failed. Political and economic "tail events" are unpredictable, and their probabilities are not scientifically measurable. No matter how many dollars are spent on research, predicting revolutions is not the same as counting cards [ADDITION OK, TO DRAW OUT THE BLACKJACK METAPHOR?]; humans will never be able to turn politics into the tractable randomness of blackjack.

Most explanations being offered for the current turmoil in the Middle East follow the "catalysts as causes" confusion. The riots in Tunisia and Egypt were initially attributed to rising commodity prices, not to stifling and unpopular dictatorships. But Bahrain and Libya are countries with high GDPs that can afford to import grain and other commodities. Again, the focus is wrong even if the logic is comforting. It is the system and its fragility, not events, that must be studied—what physicists call "percolation theory," in which the properties of the terrain are studied rather than those of a single element of the terrain.

When dealing with a system that is inherently unpredictable, what should be done? Differentiating between two types of countries is useful. In the first, changes in government do not lead to meaningful differences in political outcomes (since political tensions are out in the open). In the second type, changes in government lead to both drastic and deeply unpredictable changes.

Consider that Italy, with its much-maligned "cabinet instability," is economically and politically stable despite having had more than 60 governments since World War II (indeed, one may say Italy's stability is because of these switches of government). Similarly, in spite of consistently bad press, Lebanon is a relatively safe bet in terms of how far governments can jump from equilibrium; in spite of all the noise, shifting alliances, and street protests, changes in government there tend to be comparatively mild. For example, a shift in the ruling coalition from Christian parties to Hezbollah is not such a consequential jump in terms of the country's economic and political stability. Switching equilibrium, with control of the government changing from one party to another, in such systems acts as a shock absorber.

Since a single party cannot have total and more than temporary control, the possibility of a large jump in the regime type is constrained.

In contrast, consider Iran and Iraq. Mohammad Reza Shah Pahlavi and Saddam Hussein both constrained volatility by any means necessary. In Iran, when the shah was toppled, the shift of power from the shah to Ayatollah Ruhollah Khomeini was a huge, unforeseeable jump. After the fact, analysts could construct convincing accounts about how killing Iranian Communists, driving the left into exile, demobilizing the democratic opposition, and driving all dissent into the mosque had made Khomeini's rise inevitable. In Iraq, the United States removed the lid and was actually surprised to find that the regime did not jump from hyperconstraint to something like France. But this was impossible to predict ahead of time due to the nature of the system itself. What can be said, however, is that the more constrained the volatility, the bigger the regime jump is likely to be. From the French Revolution to the triumph of the Bolsheviks, history is replete with such examples, and yet somehow humans remain unable to process what they mean.

#### THE FEAR OF RANDOMNESS

Humans fear randomness—a healthy ancestral trait inherited from a different environment. Whereas in the past, which was a more linear world, this trait enhanced fitness and increased chances of survival, it can have the reverse effect in today's complex world, making volatility take the shape of nasty Black Swans hiding behind deceptive periods of "great moderation." This is not to say that any and all volatility should be embraced. Insurance should not be banned, for example.

But alongside the "catalysts as causes" confusion sit two mental biases: the illusion of control and the action bias (the illusion that doing something is always better than doing nothing). This leads to the desire to impose man-made solutions. Greenspan's actions were harmful, but it would have been hard to justify inaction in a democracy where the incentive is to always promise a better outcome than the other guy, regardless of the actual, delayed cost.

Variation is information. When there is no variation, there is no information. This explains the CIA's failure to predict the Egyptian revolution and, a generation before, the Iranian Revolution—in both cases, the revolutionaries themselves did not have a clear idea of their relative strength with respect to the regime they were hoping to topple. So rather than subsidize and praise as a "force for stability" every tin-pot potentate on the planet, the U.S. government should encourage countries to let information flow upward through the transparency that comes with political agitation. It should not fear fluctuations per se, since allowing them to be in the open, as Italy and Lebanon both show in different ways, creates the stability of small jumps.

As Seneca wrote in *De clementia*, "Repeated punishment, while it crushes the hatred of a few, stirs the hatred of all ... just as trees that have been trimmed throw out again countless branches." The imposition of peace through repeated punishment lies at the heart of many seemingly intractable conflicts, including

the Israeli-Palestinian stalemate. Furthermore, dealing with seemingly reliable high-level officials rather than the people themselves prevents any peace treaty signed from being robust. The Romans were wise enough to know that only a free man under Roman law could be trusted to engage in a contract; by extension, only a free people can be trusted to abide by a treaty. Treaties that are negotiated with the consent of a broad swath of the populations on both sides of a conflict tend to survive. Just as no central bank is powerful enough to dictate stability, no superpower can be powerful enough to guarantee solid peace alone.

U.S. policy toward the Middle East has historically, and especially since 9/11, been unduly focused on the repression of any and all political fluctuations in the name of preventing "Islamic fundamentalism"—a trope that Mubarak repeated until his last moments in power and that Libyan leader Muammar al-Qaddafi continues to emphasize today, blaming Osama bin Laden for what has befallen him. This is wrong. The West and its autocratic Arab allies have strengthened Islamic fundamentalists by forcing them underground, and even more so by killing them.

As Jean-Jacques Rousseau put it, "A little bit of agitation gives motivation to the soul, and what makes the species prosper is not peace so much as freedom." With freedom comes some unpredictable fluctuation. This is one of life's packages: there is no freedom without noise—and no stability without volatility.