



Markus Krall

WHEN BLACK SWANS MULTIPLY

Why we must reorganize
our society



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Preface

My life as a spoilsport

Since the publication (in German) of my book *Der Draghi-Crash (The Draghi Crash)* a gap has opened up between the professional title on my business card and the first sentence uttered by the hosts who introduce me when I give talks. Until June 12, 2017 I was a “consultant to banks,” a title as unremarkable as the grey suits that fill my wardrobe and compete for space in there with the outfits of my wife and daughters. Since June 13th, 2017 I have become a “critic of the ECB,” a “crash prophet” and, in order to build me up, a “best-selling author.” My interviewers ask me with brisk regularity: “Mr. Krall, why are you such a pessimist?” My readers prefer to ask me for advice on how they can safeguard their assets against robbery by the state. The diagnosis however is the same: “Mr. Krall ranks alongside Jehovah’s Witnesses when it comes to apocalyptic prose.” Oh well, I guess I asked for that.

And yet, those who have known me a while longer know that I am an extremely optimistic person at heart. When it comes to disasters I either follow the motto of Hildegard Knef (“If I’ve learned anything about life, it’s that it goes on”) or of John Wayne (“You must always get up one more time than you fall off a horse”).

But even John Wayne would not have intentionally thrown himself off a horse (even back then there were stuntmen for that). And that’s precisely the point. My recommendation is that our society should not throw itself off somewhere, against its better judgment, while it is clear that the height of the fall would be too great. Imagine the following scenario: An amateur mountain climber loses his bearings. Six feet above the ground he gets dizzy and he doesn’t dare to jump down because he’s afraid of ruining his hairstyle. His solution consists in

climbing up the mountain face for another four feet. That way he does not have to look down. At ten feet he briefly turns around but then realizes that ten feet is more than six feet and the situation has not got any better. Now he's started worrying about his gear, his nose and his ankle joints. Climb down slowly? Are you crazy? Do you want me to have to go to a doctor? Well then, keep going up. At 15 feet he turns around once more and looks and also at 25 and 40 feet.

He looks up and he cannot discern where the face of the mountain ends, but he reckons that if he just continues going up he'll get to a ledge where he'll be able to pull himself up on to a high plateau and catch his breath. He does indeed suspect that just before the high plateau, a quarter of a mile up, there will be an overhang which, with his climbing skills, he will be unable to surmount – although he has pushed this thought to the back of his mind. Standing below are the neoliberal professors and they are stretching out a jumping blanket because he has already struggled up 70 feet. He tries to persuade himself that he is not afraid: "The view up here is awesome. I'm awesome. Well, I'm hanging 70 feet above the ground just like Harold Lloyd once dangled from a clock face on a skyscraper, but I know better than those dudes down there."

It is also clear to him that jumping, even with the jumping blanket, would be a very daring undertaking. At any rate, he can already forget about his straightened teeth. The dentist visit will be lengthy and not very pleasant and will only be feasible once the swelling of his lips goes down again. He knows all this and he keeps climbing because now his dentist is also standing below and explaining to him that he must stop now if he wants to keep his jaws. "You damned pessimist," he gasps at the dentist. "No," the latter answers. "I'm only the dentist. And if you would, at long last, just come down then I would be full of optimism. We can put this right again."

That's exactly how I feel, too.

Prologue

"To act on the belief that we possess the knowledge and the power which enable us to shape the processes of society entirely to our liking, knowledge which in fact we do not possess, is likely to make us do much harm."

FRIEDRICH AUGUST VON HAYEK

The future is not what it used to be. What sounds like an oxymoron is the consequence of cognitive dissonance. Yesterday's future is the present. And because, yesterday, we were already not very well able to predict what it might look like, the present must differ from the forecasts made at that time. Developments that nobody had anticipated have rolled over us. Developments that were expected have not occurred. One statement characterized by disappointment that recently went viral (incidentally, a word that didn't appear in any forecast of the future just 20 years ago) was "they promised us flying cars and all we got was an iPhone." It is not without a certain irony that flying cars are, so to speak, just around the corner. Only, we don't call them cars but rather passenger drones.

Now, the starting point for forecasting the future is of course a different one from 1970. Yet, while we believe that we now stand on a higher hill than in 1970 and, therefore, should be able to see farther and clearer ahead we simply don't. We merely succumb to the illusion that we do.

When you open a newspaper these days, it seems to be totally clear where we are heading. Climate change is a reality, but our elites are managing this with wind turbines and solar panels. The banks are in dreadful shape, but our elites have regulated them into calmer waters. Digitization will change many things, but our politicians will

make sure all goes smoothly by paying a universal basic income. We will fund this out of a machine tax. Quantum computers are rather esoteric, but they will keep the machine, which enhances our electronic toys every year, running for a while yet. Robots will soon be ubiquitous, but some of them will be sexy and provide a cure for all those lonely people who have become firmly attached to their electronic pacifiers and have swapped the real world for the virtual reality of social media. So, please don't worry.

Terrorism is spreading, but we have global surveillance to keep it in check as we do with cybercrime. The only real military threat is posed by North Korea, but we hold the revolver that is nuclear deterrence to its temple. Immigration is not out of control, because we have decided to adopt it. All will be well.

Dream on.

Our perception has been drowned out by the illusion of linear trends, which do not allow us to recognize the force of the exponential trends that are driving key developments, especially in technology. Moreover, we do not possess the power of imagination to grasp the consequences of the mutual interference of trends. Furthermore, we would appear to be lacking in any sort of sensory apparatus that is able to detect imbalances lurking beneath the surface of the water like a crocodile in a swampy pool.

Because our political elites hate it when citizens worry about things (by definition, this makes the elites look stupid and inept) they try to smooth over anything that looks like trouble or *volatility*. No nasty images, please. The welfare state will take care of your problems from the cradle to the grave and even into the grave. A general aversion to risk is thus instilled into people. Risk is viewed as something archaic, a relic from the dark ages when humans were still exposed to hunger, war, diseases and plagues.

In our civilized technology-ruled societies the individual risks are in fact much smaller than they have ever been because the level of our prosperity and the resources available to us are infinitely greater when compared with any other generation in human history. Risk

and volatility are more likely to find their expression in the question of whether economic growth will be 1% or 2% and, thus, whether we will be able to buy the latest 70-inch QLED monitor already in October, or if we will have to wait until Christmas.

All the same, politicians hate volatility of any kind and try to gloss over it, usually with borrowed money or – if that is not available – freshly printed money. However, you cannot get rid of volatility by spending money, at most, you can sweep it under the rug. You can shut it up in a repository from which it will eventually escape, like the slimy ghosts in the movie *Ghost Busters*.

History can provide numerous examples of attempts to suppress volatility that merely led to its accumulation and subsequent concentrated discharging. The biggest experiment of this type was the Soviet Union. It flaunted the supposed strength that it saw in the superiority of its planned economy because it didn't generate business cycles or financial crises but merely consistent growth. This was driven in the engine room of *Gosplan's* 5-year plans, which advanced the prosperity of the comrades from one great leap to the next.

We all know how this ended. The volatility that had accumulated over 70 years had created imbalances big enough to consign one of the biggest, nuclear-armed and seemingly invincible empires to the dust heap of history, in a matter of months, once the pent-up pressure had found its way out and had escaped. And yet, there are object lessons of a wholly practical nature that could have been used to study this.

In the great wilderness of North America wildfires were a common event for many thousands, indeed probably for millions of years. They occurred frequently, every year. They were triggered by strokes of lightning, hot weather and drought. They were normal events and nature was obviously able to cope with them. However, at some point, not too long ago, the nature of this phenomenon changed. Wildfires became large, very large. In fact, they became so large that they could be seen from space without optical instruments. Why? In the 1930s, increasing settlement and the related expensive infrastructure led to

the view that wildfires were not a good thing, but rather an undesirable event that should be prevented.

With the introduction of planes that were able to detect fires at an early stage and extinguish them it became possible to suppress them while they were still small. The volatility had been managed and subdued – brought under control using the means of human technology. Or so it seemed at least.

Over the years, the dead wood and brushwood, which would normally have been burned in the periodic wildfires, started to accumulate at a rate that was faster than the natural decomposition rate because the climate is very dry. This accumulation of dry, easily combustible wood was the imbalance that piled up beneath the threshold of perception. At some point, this amount reached a critical mass and it just needed a lightning stroke or a littered bottle, acting as a magnifying glass, to spark off a wildfire of enormous proportions and force that ate its way through forests, villages and fields, leapt over rivers and roads, turning everything in its path to ash. The accumulated volatility was violently unleashed.

Our society has found countless ways and means to suppress volatility in the mistaken belief that it is possible to do so with impunity and that the volatility will then go away without taking its revenge. We apply Keynesian debt-financed spending policies to smooth out the business cycle in order to avoid unemployment and bankruptcies, we loosen the purse strings of the almighty central banks in order to stabilize financial markets and avoid crashes and the bursting of speculative bubbles. Over the course of the business cycle, we prevent companies from firing people that they had previously hired and thus protect their employees from the consequences of structural change. We have even regulated free speech and political ideas under the delusion that we have banned what we classify as hate speech or fake news and, in this way, provoke the very hatred that we purportedly wished to subdue.

All these measures work for a while. The imbalance grows. It reaches a critical point and critical pressure. Then suddenly the container

ruptures and the volatility is released like the energy in an explosion. The impacts on the welfare of people are then more far-reaching and worse than the benefit, achieved over time, that was obtained by quashing the risks. The explosion, the *discontinuity*, is then amplified by two effects. Firstly, it creates huge disorientation as it is much more difficult for people to adapt to sudden extreme changes. Secondly, people who are no longer adept at dealing with the consequences of volatility because they have been shielded from it for years are no longer equipped to deal with it psychologically and in terms of their expertise and knowledge.

And there is an additional danger. As we have suppressed so many different types of volatility over so many decades, the risk of correlation has arisen, thus, the possibility that several big imbalances reach breaking point simultaneously. This could happen either accidentally or by mutual causal reinforcement. One big discontinuity would trigger the next. A chain reaction would be initiated that society could no longer circumvent. Its tried and tested instruments would break down and its internal functional processes would come to a grinding halt.

At this point revolutionary change would be easily possible.

In risk management, types of risk can be divided into categories according to their behaviors. One of the possible dimensions here is a scale between flat or granular and cluster risks. *Flat risks* have quantifiable daily volatility from which we can derive a distribution of the results and which we can manage using the classic methods of risk measurement and risk control. Examples of such behavior can be found, in particular, in highly efficient financial markets. That does not mean that the distributions describing their behaviors do not have any extreme tails and thus no extreme events are possible, even though unlikely. However, it means that market participants can by and large understand the risks they take. Derived from this they are able to determine how much buffer capital they require in order to survive if extreme events with a low probability materialize.

Types of flat volatilities are very often rooted in the evolutionary principle by which nature organizes its learning processes. It governs

ecosystems, markets or systems in general with agents or participants who have to improve their capabilities for their survival over time. They do this through an evolutionary process with the heuristic method of trial and error. This method of learning is based on success and failure and occasionally sends agents down the wrong path. In nature this is then an evolutionary dead end and leads to the extinction of a species. This is the result of their inability to accomplish what Darwin had described as the “survival of the fittest,” but which in reality means the survival of those that can best adapt themselves to their environment. In an economic context, error means that wrong plans will be eliminated by the competition in the market. Best adapted means the most cost efficient, most capable businesses, which produce those things that customers want and for which they are prepared to pay, will prevail and survive. This is called economic success.

The fact that inefficient, unproductive businesses that do not produce what customers want go bankrupt is the source of all kinds of volatility that we are able to observe in economic life. Bankruptcy itself creates huge volatility for the income of the business owners and their employees that are affected by it. Varying degrees of economic success or also merely the perception of variances lead to the volatility of stock prices. Wrong perceptions of growth, market demand and trends can lead to overinvestments that can trigger waves of bankruptcies, defaults and business cycles. Overinvestments constitute a specific kind of wrong plan that are eliminated by evolutionary competition.

At the same time, trial and error are however the only way for market participants, the agents of the ecosystem – and therefore for the whole of society – to learn. Learning means progress, especially technical progress and thus leads to growth and future prosperity. The same mechanism that drives biological evolution, mankind and society forward also generates volatility that we observe as the flat form of risk.

Cluster risks, on the other hand, are very difficult to understand and measure. We see them in the natural world in the form of earthquakes

and volcanic eruptions, in any case if you consider them on an individual level. By looking at many volcanoes and earthquake zones we can however derive a smoothed distribution of these events and draw conclusions about the probabilities within a defined period of time. That is, for example, what the reinsurance industry does with all types of disaster risk.

Between flat and cluster risks there is a sliding scale of intermediate states. The more efficient a market, the more frequent a natural event, the more data we are able to collect over time, the smoother our distribution of the risk will become and the better our ability to measure it. A volcano that erupts every day, for example, like Mount Stromboli does on the eponymous island north of Sicily, usually does not pose a real danger because it continually gives off energy at a low level. All that we should avoid doing in order to deal with this situation is to put in place on top of the volcano a concrete block that is 2x 2x2 miles in size because we don't daily volcano eruptions.

Standing the argument on its head means that we can make the risks more clustered by taking away the market efficiency as well as the frequency of the transactions and impair the measurement of the resulting data. And that is precisely what we are doing all the time. This creates the huge imbalances and an urgency to correct them. And we then get these corrections in the form of discontinuity. We can therefore compare discontinuity with an event where a very large cluster risk materializes.

In this sense, not all discontinuity risks are man-made though, as we will establish in Chapter 2 of this book. It relates to the discontinuity caused by quantum computers. While they are of course man-made, discontinuity does not arise primarily through suppression of volatility. It is a cluster risk due to the particular nature of this technology. The ratio of the processing power of quantum computers to that of traditional computers powered by microchips with transistors is like the one of nuclear energy to chemical energy. To give you an idea of the proportions, the amount of matter that is transformed into energy in the course of a 20-kiloton nuclear explosion is just two grams;

20,000 tons of chemical explosives are 20 billion grams. The energy ratio is therefore one to ten billion. With quantum computers we have no idea where that stops. It will likely be much more.

If we consider that flat risks and cluster risk are interconnected and if we bear in mind that volatility suppression transforms flat risks into cluster risks and, by doing so, provoke existential threats we need to ask ourselves if, as a society, we manage risks correctly. The answer to this is no.

Society and politics must find a different approach to how we understand risks and deal with them. For our current generation of politicians, risk management is about micromanaging volatility, ideally suppressing it. There has to be a fundamental change to this in the future if we want to build a society that can survive and thrive in the coming upheaval. Stop turning risks into cluster risks, but rather do the opposite. And learn to identify very large discontinuity risks and how to deal with them in an intelligent way.

This book aims to build an intellectual bridge between the status quo of the suppression of flat, granular risks and that which we will need in the future if we want to avoid disastrous discontinuities. In doing so, we will take a closer look at several discontinuity risks in the areas of economics, technology, politics and geostrategy.

From these examples I will attempt to derive general insights that characterize the common mechanisms that underlie these discontinuities. This will include the common mechanism of trial and error as a source of volatility, its translation into perceived risk, the way society manages or mismanages this risk, the tools for and means of suppressing volatility and how this suppression leads to the accumulation of large imbalances. Ultimately, I ask questions about the trigger that could lead to the correction of an imbalance.

All social systems – an economy, technology, ecology, business, the systems of internal and external security – are cybernetic systems that are governed by evolution. They are likewise subsystems of a larger global ecosystem. As all these systems, including the limited subsystems, evolve over time using trial and error. The artificial stop that

that we have forced on our own socioeconomic subsystem means we are collectively falling behind the global learning curve. Standing still thus means regression because all the others are moving ahead. The tension resulting from this creates the imbalances that require a correction and realignment. The magnitude of the accompanying crisis will depend on the extent and duration of the preceding intervention aimed at suppressing risk because this will have caused the suspension in the evolutionary development of our socioeconomic systems.

At the end of every chapter with an example, three perspectives will be highlighted: what does this mean specifically for decision-makers in politics and in governments, for businesses and for citizens in their capacities as employees, taxpayers, consumers, savers and investors?

The policy options that are available to us to deal with the disruptive developments during a phase when we are adjusting to the global learning level of the larger ecosystems will vary in different ways for these individual stakeholders. Consumers and businesses will need to think about the microeconomic impact on their assets and their ability to compete and survive in the market in a post-crisis future. However, governments and policy makers will have to apply very different lessons and ask themselves: a) how do we manage the crisis? and b) how do we change our future policies in order to avoid the artificial accumulation of imbalances?

The second element is indeed the one of paramount importance as it is essentially about how we should organize our society. What should our economic system look like? What should our democratic policy formation process look like?

We will see that the really fundamental assumptions that form the basis of our constitutional set-up are at stake here. And these assumptions are now being challenged.

Introduction

“It is not in the stars to hold our destiny but in ourselves.”

WILLIAM SHAKESPEARE, *JULIUS CAESAR*, ACT 1, SCENE 2

“We live in an age of disruptive change.” That is a truism which has been applicable for many centuries, starting with the Renaissance, which liberated people from the intellectual confinement of the Middle Ages, moving through the Age of Discovery, the first scientific revolution preceding the first Industrial Revolution of mechanization, which accompanied us through several technological Kondratieff Cycles, namely, steam, chemistry, electricity, mobility, aerospace, telecommunications and, now, digitization, life sciences and space. Therefore, analyzing disruptive change can therefore be confidently called a no-brainer.

Describing the new industrial revolution though is not really what this book is about. There are zillions of books that deal with that topic with varying degrees of success.

The technological changes of today are however contributing to a new type of change that we are facing. In popular science, the technological impact is described as an “age of disruption,” “age of innovation” or the arrival of “Singularity,” the convergence of humans and machines.

These changes happen, but we miss important pieces in the puzzle of the overall picture if we believe that we only need to follow their trend lines to understand where we might be heading as a society, country, civilization or, in fact, humankind. In such a picture, technology does indeed contribute to the disruption, but it is only one of several factors.

What we really must deal with is rather the interplay of the technological, social, infrastructural, psychological, cultural, and political forces that, through their interactions, can create sudden leaps and disruptions of cataclysmic proportions. Developments break out of their observed trend lines, events behave like quantum leaps, changing their aggregate conditions within an extremely short space of time, seemingly unforeseeable and chaotic. Hidden undercurrents force their way to the surface creating moments of crisis and complete disorientation for decision-makers – “elites,” consumers, managers, academia and political leaders alike.

Don't believe that the global financial crisis and the Euro crisis are perfect examples of this. As regards the types of sudden change, we “ain't seen nothing yet,” We are facing an altogether new beast. One that will pull the rug from under our feet.

We are facing discontinuity.

Discontinuity will challenge our conventional wisdom. It does not fit into our well-established explanatory models. It switches off our ability to master problems and situations by the power of our intellect because we do not have a model in our mind making sense of it all while it is happening.

With discontinuity the equilibrium that defines the status quo ends and, frequently, several new equilibriums are possible. It then depends on actions or on sheer luck which new equilibrium materializes. Reality behaves like a sphere balancing on the peak of a mountain with several valleys surrounding it. We know it will roll down one of its slopes ending up in one of the valleys, but we cannot anticipate which one this will be.

One example will be presented in Chapter 2 – the current monetary policy will either lead to deflation, to hyperinflation or to both in varying sequence. We know that this will be the mathematical solution space once the accumulated imbalances have been released. However, we cannot say with any certainty which scenario will occur because this depends on the political actions and reactions of other participants, such as, consumers and the corporate sector. Although,

both the outcome and the sequence of events will be critical for individual economic survival.

Discontinuity will thus put an end to our ability to cope and will throw us back to relying on the principle of trial and error in a brutal, rude and unforgiving way. And this will affect individuals as well as society as a whole.

Discontinuity combines a situation of maximum error rates with a situation where making errors entails maximum costs.

We can find examples of discontinuities in history as they are not fundamentally new. They range from the start of the First World War (most recently described as sleepwalking into disaster), the sudden economic downturns of 1929 and 2007, the oil crises of 1973 and 1979 that triggered stagflation, or the collapse of the Soviet Union. What these events have in common is that they arose from situations where, like a rubber band, things had been stretched slowly over a long time with the stretch continuing despite reaching its structural limit. Then, all of sudden, the elastic snaps and flips back in a millisecond.

The difference between the above examples and our situation today is the concentration of discontinuities currently arising from imbalances that have accumulated and which are rooted in the coincidence of technological and social change and the inability of our governance to cope with those imbalances at an early stage.

The imbalances have two main root causes: long-term technological and social trends like Moore's law and the demographic decline and economic imbalances resulting from macroeconomic mismanagement. As the imbalances interact and coincide their combined impact will be truly cataclysmic.

In some cases, the mismanagement results from the decline in the governance that we have given ourselves as a society. This ranges from our political system to our legal system as well as our economic rulebook. It also relates to our educational system that has continued to deteriorate and no longer provides the next generation with the opportunity to acquire the skills needed to cope with future challenges.

We are not well equipped to deal with them at a time when the number of “Black Swan” events are multiplying. The rarity of the Black Swan is being replaced by its ubiquity. The Black Swan is breeding like rabbits.

Some lessons that earlier generations had learned from historic events seem to have been forgotten as the memory of past failures and the consequences of bad governance has faded away. At the same time, the discontinuities in the making are piling up as a whole range of developments reach their nadir of instability. Moreover, several of the looming discontinuities are not the result of external forces, such as technological progress, but rather the result of large-scale political mismanagement that, frequently, attempts to suppress developments until the pressure of change is so great that it cannot be kept under control anymore. Decades of pent-up volatility then escapes in an instant.

So, are we once again becoming the helpless victims of forces beyond our control or even our understanding? Will the approaching Age of Discontinuity throw us back to a time when humans had to accept “fate,” “the hand of god(s)” or immeasurable uncertainty as the forces that ruled their lives?

I believe that the answer to that is no. However, we must arm ourselves with much more systematic know-how so that we are able to spot, identify, analyze and understand discontinuities. We need to re-learn civilizing techniques to allow imbalances to readjust on a more regular basis instead of saving them up for a big bang. Moreover, we need to understand that collective efforts to manage imbalances require collective instruments that are based on the interaction of individuals. Automated and self-stabilizing cybernetic feedback loops based on the wisdom of groups will be of greater help to us. We should not rely on the wisdom of self-appointed geniuses.

There is no shortage of people who lay claim to such ingenuity. Political “leaders” of various colors, advocates of the planned economy and adherents of bureaucratic wisdom are the false prophets claiming superior insight and ask people for a mandate they can never fulfill.

They only make things worse, not better. In fact, their very influence has created several of the imbalances that will provide us with prime examples of discontinuity in the very near future.

This all means that we need stability through markets, rules-based governance and a willingness to discard central planning in nearly all matters. This is the recipe for a future in which we can reclaim our ability to be masters of our destinies.

On the following pages I will lead my valued readers through several examples of discontinuities and demonstrate how and why decentralized decision-making approaches are more promising and successful as a survival strategy for societies when compared with planning, bureaucracy and the assumed wisdom of politicians. I will also try to put impact of discontinuities into perspective in terms of decision relevance for political and management decision-makers because the coming discontinuities will profoundly change the structure of our three most important decision-making bodies: citizen-consumer-workers, businesses and governments.

In this book we will look at several examples in order to provide an overview of the multiplicity of discontinuity scenarios, their possible interaction and overlapping as well as how they could unfold. This will allow us to form some hypotheses in order to answer the following questions:

How should a society be organized to gain resilience? The answer is through markets.

Are all discontinuities the result of developments that we cannot avoid and which hit society like a curse? The answer to that is no.

Can we avoid some of the discontinuities already identified on the horizon? The answer is that this is unlikely, but we can prepare for them so that we are better able to survive.

The examples of potential discontinuities that I have selected are some of the ones that I believe are highly likely to happen soon. This list, of course, is not “MECE” (“**m**utually **e**xclusive, **c**ompletely **e**xhaustive”) but was put together from a personal perspective of an interdisciplinary view of the world that focuses on economics, politics

and technology and how they interact. On the following pages we will take a closer look at those discontinuities that, in my view, will soon be affecting us directly. These include:

- ▶ The imminent destruction of the monetary system, triggered by the collapse of the Euro;
- ▶ The collapse of privacy and secrecy including the privacy of governments globally triggered by the arrival of the quantum computer;
- ▶ The end of parliamentary party democracy due to the consistent failure of elites;
- ▶ The crisis of industrial structures resulting from the digital and life sciences revolutions and their accelerating impact on the economic environment that will define a “new future for the firm”;
- ▶ The full scale armed, and potential nuclear conflict between Europe and Islam led by a resurgent Turkey with imperial ambitions and acting in tandem with the international Muslim Brotherhood organization.

These examples will illustrate what the distribution of labor and duties between decentralized decision-making mechanisms (markets) and centralized decision-making mechanisms (states) will look like in the future. It will lead to a return to the old and proven concepts about their role and interactions. Moreover, these results will not come as a surprise to the supporters of the Austrian School.

Specifically, we will first investigate the currency discontinuity. Here, governance and elite failures in the form of misguided monetary policy will trigger an economic disruption and “regime change” not seen since 1929. (*Chapter 1, The Currency Collapse*). New blockchain technology and cryptocurrencies might then well fill the resulting vacuum, but the really critical element will be that politicians will have to give up the illusion that they can print money for political ends. If that happens we will see a paradigm shift with respect to what currency actually means.

The next perspective will focus on a specific technology (*Chapter 2, Technogeddon, or Quantum Computing Dilemma*). We will discuss what I like to call the quantum computing dilemma as the race for quantum computers will reduce the doubling time, according to Moore's law, first to months, then to days, then to hours and provide a level of computing power that will render cryptography and IT-security useless for the complete conventional, i.e., non-quantum-computing based, global IT-infrastructure, for a transitional period of time. During this transition phase the first mover advantage of quantum computing technology will be such that there will be no system or database on the planet that will not be completely accessible, readable and open to manipulation, only the first mover will have access and access denial control. This will likely lead to the biggest redistribution of power in human history through the control of information. It will also redefine our knowledge of artificial intelligence.

In *Chapter 3 (The End of Multiparty Democracy)* we investigate the discontinuity of parliamentary party democracy as a colossal failure of political and legal elites that is likely to upset our predominant and seemingly invulnerable political system. We will see that this system is not yet the end of the story and certainly not without alternatives whose claim to legitimacy are at least as valid as the current system. Several scenarios of evolutionary and revolutionary development are presented that address the question of what will replace the current system. A reinigorated system of liberty, or a slide towards authoritarianism, or a seemingly paradoxical blend of both?

Chapter 4 (The new Creative Destruction and The End Of The Firm As We Know It) is about social discontinuity that, as history has shown, inevitably accompanies industrial revolutions, affects the ability of most people to adapt quickly enough to be able to maintain their place in the social order. One key question here relates to the pace of the change in the course of a creative destruction because "business discontinuity" is the unavoidable result of the parallel technological revolutions based on digitization, life sciences and integrated automation through the Internet of Things (IoT). However, these technological

paradigm shifts will not force change, but rather the sheer speed of the environmental changes that will be triggered by this simultaneous explosion in performance.

We investigate how the various types of discontinuities and non-linearities will set the stage for the **future of a different kind of firm**. This is intended to give managers an idea of how the forces of change will affect the ways companies operate, look like and provide opportunities for human welfare during and after the upheavals. It will truly be TEOTFAWKI: The end of the firm as we know it.

Chapter 5 (The Geostrategic Vacuum) investigates the impact of the power vacuum resulting from Europe's geopolitical and military failures and the forces that will try to fill it. In this discontinuity we observe the results of demographic divergence between Europe and its periphery, moreover, the failure of the political elites to properly assess risk and read the intentions of political adversaries as well as the loss of a sense of purpose for a whole civilization. Indeed, our propensity to "manage conflicts" rather than looking for proper solutions that address the underlying causes is a typical example of suppressed volatility that can accumulate and, ultimately, become a discontinuity called war.

In *Chapter 6 (The System of Liberty or the Death of Civilization)* we discuss what will follow the hollowing of the values of Western societies and raise the question of whether a society without values rooted in the Judeo-Christian-inspired enlightenment is able to survive in a world of increasing complexity and discontinuity. It is the author's hypothesis that the lack of belief in these values that is affecting Western society will not remain without consequences as it undermines the foundations of a stable civilization and thus diminishes resilience to the challenges of life. This is also about what Yuval Noah Harari describes as society's "narrative."^{2 3}

These challenges are all manifestations of volatility that result from trial and error thus the lifelong learning experience for the individual as well as for society. This propensity is one of the key drivers of doing away with our willingness to manage the short-term pain of

volatility at the expense of threatening long-term stability and great discontinuities.

I will argue that only a system of liberty rooted in spiritual values will enable society to adapt to the revolutionary changes ahead. We must choose between a system of liberty rooted in values and the end of Western civilization.

Chapter 7 (Looking back from 2035 – Two Scenarios) hazards a guess at what the future will look like. Is it possible to formulate something from which it will be clear that, actually, this is something that you can't know if you are aware of the tremendously complexity that is involved? No individual or bureaucratic institution would be able to understand it. This chapter provides a look into the future and a description of it as if we were looking back.

Yet, while we know that this is impossible, nevertheless, it is possible to sketch out two scenarios of an imaginable future. Whether or not these scenarios occur will largely depend on the one big decision that we as a society will have to make, namely, whether or not we want to place our trust into a decentralized market organization to provide the best collective decision-making system mankind has ever developed (and which was the result of evolutionary processes)? Or do we think that bureaucratic institutions that are run by a small number of people will be able to make better decisions as regards the allocation of resources? Will we explore, with the help of the market, the unknown territory that so far has always turned out to be the best place for people? Or are we going to head for the dystopia of bureaucratic tyranny that promises us a utopia but throughout history without exception has facilitated a hell on earth?

The Currency Collapse

“So this, then, was the kernel of the brute!”

JOHANN WOLFGANG VON GOETHE, *FAUST I*, VERSE 1323

Much has been said, written and discussed, including by the author⁴, about the problems that have arisen from the monetary policy dilemma and how, over the last decade, central bankers globally have been caught between a rock and a hard place. Following the US mortgage securities crisis and the subsequent collapse of Lehman Brothers, in 2008, the central banks in all large economic blocs – the US, the EU, Japan and China – initially adopted a policy of lowering rates, providing cheap liquidity to banks and forward guidance. Central banks told investors not to expect rising rates for a long period of time – such expectations were usually shaped by the markets. When the Euro crisis started the policy was switched to massive monetary expansion, which was characterized by negative interest rates and quantitative easing, especially by the European Central Bank (ECB). In the course of this, the ECB’s balance sheet surged to over four trillion Euros. More than 2.4 trillion of this was made up of bonds that the ECB had purchased from Eurozone member states, their banks and companies as well as of securitized loans.

The official reason given for these measures was to deflect the, presumably imminent, deflationary pressure, as expressed in a momentary negative inflation rate of just under 0% for a few days, although the core inflation rate had remained at just 1%. The true reason though

had pretty obviously nothing to do with that. It was clear that the negative development in the consumer price index was the result of a fall in oil prices that was well within the usual range of volatility for the price of this commodity. Such short-term developments are common and, for good reason, as they have never been reliable indicators for monetary policy in the past – at least for those central banks putting sound money, price stability and the long-term prospects of the economy at the focus of their considerations.

By contrast, the aim of the ECB's President, Mario Draghi, and the majority of its Council was simply to redistribute money from Europe's savers to Europe's over-indebted governments, namely, those in Greece, Cyprus, Italy, France, Spain, Portugal and Belgium. That should not have come as a surprise. The very fact that ECB governance is based on the principle of "one country – one vote" means that, in the Council, both democratic control and monetary policy independence are turned upside down. The one vote representing, for example, Cyprus with just a few hundred thousand citizens has the same weight as the one vote representing Germany with over 80 million citizens. Germany has more than a dozen cities that alone have more inhabitants than the whole of the sunny island in the eastern Mediterranean.

Monetary policy was thus ruthlessly and illegally abused for redistributing roughly one trillion Euros for the benefit of spendthrift and corrupt governments in the vain hope that, contrary to all reasonable expectations, this gift would create an incentive for these governments to do precisely the opposite and thus stop spending and put an end to their policies of squandering money. Of course, nothing of the sort happened. Deficits have continued to accumulate and after ten years of an ultra-loose monetary policy the debt swamp is deeper than ever before.

The architects of this policy have employed hundreds of people with economics degrees. They are followers of the leading school in their discipline, Keynesianism, with its variety of flavors. Keynesianism and its macroeconomic framework provide the ideological

backbone for all those politicians who are seeking arguments to spend more money and buy votes by doing so. It deals with the economy by dividing its participants into highly aggregated entities, like “the state,” “consumers,” “the business sector” and uses a system of circular flows of money and goods between these aggregates to explain the overall behavior of the system. Hence the term “*macroeconomics*,” dealing with aggregates, as opposed to *microeconomics*, dealing with individual economic units and the incentives that underlie their actions.

This approach creates economic models that – unsurprisingly – claim to explain the behavior of aggregate entities. The problem with this approach is that it doesn’t explain anything. The true engines of economic behavior are millions of individuals collecting and processing a huge amount of information, developing needs and preferences, utility functions and the courses of action that result from them that cannot be captured by this approach. An entire industry of economic academics is busy rationalizing observations of the past with the help of fresh, new ideas and explanations of aggregate behavior only to discover that, in the subsequent cycle of events, the models that have constructed on the basis of ex-post performance fail when it comes to anticipating future events, behavior or developments.

The ultimate test of any scientific explanatory model is its ability to reproduce the results. In modern economics this happens only randomly. In the Keynesian models, the circular flow of goods and the flow of money running in the opposite direction relate to the real workings of the economy like a watch relates to time, i.e., it is able to describe and measure but completely unable to explain the phenomenon.

This rout has not stopped the proponents of this superstition from claiming to be the bearers of the one and only truth in economic science. As the years progress, a countless number of complications are being built into their models. This has been enabled by the ever-increasing processing power of our computers that seemingly allow the handling of an infinite amount of complexity. This is used to explain

away why the model deviates from reality. Economics today is like official astronomy was in the early Renaissance when those in powers were not able to accept the heliocentric model of the world. Instead new complexities kept on being invented, these were called epicycles, in order to prove that the Earth lay at the center of the universe and the sun was circling around it, as all other celestial bodies were supposed to do.

The Keynesian School of economics is just as wedded to power as the geocentric model of the universe was 400 years ago. Both are tools for consolidating and hold on to power. In the 17th century, this was based on religion, in the present day, this explanation of the world provides governments and bureaucrats with a justification for managing our lives and doing so in a way that eliminates volatility. The reason for this is very simple – people hate volatility. They do not know or do not accept that volatility is a necessary byproduct of the change that is called progress. Progress is the accumulation of information and knowledge, also known as learning. Progress happens through trial and error. Error means losses. Losses are inconvenient and inconvenience is bad if you are seeking reelection in our current system of party democracy.

Keynesianism was invented with the stated intention of smoothing out the volatility of business cycles by claiming to have found the holy grail containing the explanation for it. This holy grail was “demand.” Yet, in truth, demand is not a holy grail, but at best a holy cow. Demand fluctuations are not the cause but the effect of underlying changes in behavior at the microeconomic level and individual decisions rooted in the best apparatus for mastering complexity on the planet – the market.

In Keynesianism demand provided a one-size-fits-all explanation for everything. Moreover, what is true in economics, as well as in most other aspects of reality, is that for every complex question there is a simple answer ... that is wrong.

Any problems in the economy are attributed to (downward) fluctuations in demand. If industry does not invest enough then investment

demand goes down. If consumers are not confident then consumption demand goes down. If the state wants to keep its debt under control (not that it really would ...) then public demand goes down. As industry and consumers cannot be forced to create more demand (short of a full-scale planning economy where, by the way, demand is never in short supply but supply always is) the state assumes the role of an eternal demand buffer. Each time demand outside of the public sector goes down, an “expert” pops up and calls for “action.” The government then piles up debt to create demand by setting up new expenditure programs, usually to satisfy the loudest voices in the nest of lobbyists.

Once this temporary period of “weakness” in consumption demand or investment demand comes to an end, naturally, the bureaucratically-run expenditure program stays in place. Over time, this drives up the state’s share of the overall economy as well as the country’s public debt ratio. Industry, of course, enjoys the state’s additional demand because it ensures profits without having to make structural adjustments. Poor investments that are not aligned with the true structure of demand in an economy pile up and create imbalances that cannot be detected by the Keynesian “supermodels” because it is not possible to incorporate into them information about the relative scarcity of products based on prices in the market.

The Keynesian school has thus provided the perfect tool for politicians to run the ultimate populist policy – the “terror of consumption” – and get re-elected many times by an economically uninformed or misguided electorate while the hidden cost piles up in the dark.

However, the story does not end there. As there is a limit to government spending in the form a state’s ability to service its debt and pay interest on it, the engineers of demand created a second valve that can be manipulated – monetary policy. It serves two purposes, namely, keeping interest rates depressed to give politicians more leeway to fund spending with debt and making investments attractive for industry that would not be attractive under normal circumstances. The lower the interest rates and therefore the lower the cost of capital, the

more individual investments start to look attractive. This should drive up investment demand, which, as everybody will agree, sounds like a good thing. The problem is, however, that it is not a good thing because it gives incentives to industry to channel money into bad investments. More and more investments accumulate that do not meet the hurdle rate of return required to drive up productivity and efficiency.

Companies then invest in bad ideas and outdated equipment and are less careful in judging customer needs so, ultimately, these investments are wasted. They hold back productivity advances – the only true source of economic growth. Were it any other way, then a Keynesian spending program could have catapulted mankind from the Stone Age to Star Trek if it had only been big enough. It's not going to happen, I'm afraid.

We have been adhering to these wrong policies for a very long time now and consequently a vast amount of wealth along with opportunities and long-term growth has been wasted.

Yet, that doesn't even constitute the biggest problem. The really big problems are the accrued imbalances in the economy that are the result of decades of suppressing volatility. The rubber band has been stretched to its limit now. When it snaps this will produce a discontinuity of gargantuan proportions. This will be true for all big currencies and their respective economic spheres, the US Dollar, the Yuan and the Euro. While the details will differ and there will be slight variations in the impact, nevertheless, the coming adjustment will hurt the global economy in a way not seen since the 1930s. In the book I investigated this phenomenon using the example of the Euro because the Euro is not a real currency but merely an illusion of one and it creates imbalances simply through the way it is structured. No other currency can claim to be such a cleverly designed time bomb.

The imbalances in the Eurozone create a specific form of economic volatility that, in turn, has been suppressed through fiscal and monetary policy measures. When the Eurozone was created, in the 1990s, it was already clear that, in the past, the member countries had never moved in sync with regards to economic policy, inflation,

growth, fiscal discipline and, as a result, competitiveness, and to say nothing of decoupled business cycles. In the single market – which was created in the 1980s and was based largely on a free market and free trade design drafted by the British government under Margaret Thatcher – the natural pressure relief valve to balance the resulting economic tensions was the floating exchange rate. It was slightly distorted by the rather economically illiterate concept of fixed exchange rates within defined ranges (the snake in the tunnel it was called), but markets forced regular adjustments of the ranges anyway. So these ranges tended to be just window dressing.

Even before the introduction of the Euro, politicians had misjudged the costs and benefits of floating versus fixed exchange rates. Exchange rate volatility was judged to be an obstacle to economic integration and cross-border supply chains because companies were exposed to FX-risk that they had to manage at a cost. This and the convenience for travelers and tourists of not having to exchange money when crossing borders was cited as the most visible economic benefit of the introduction of the Euro.

The other big “benefit” was a symbolic political one. One currency would act as the source of the unification of Europe that would then move towards “ever closer union” and, ultimately, this would lead to a “United States of Europe.” This “chorus” had almost a religious quality to it and like every religion it had and has its true believers and zealots.

Liberal thinkers like Lord Dahrendorf and others had issued stern warnings against these misconceptions. They described the Euro not as a source of convergence and unity, but rather as a source of discord and disunity for European nations. Looking back over the last 20 years it has become clear that they were right all along. However, the next few years will demonstrate how extremely clear-sighted their diagnosis was.

Before the Euro was introduced, the assessments by markets and rating agencies of the quality of government debt across the continent differed hugely. While the southern periphery had always employed

monetization of debt to allow its politicians to spend beyond their means and then collect this money in the form of a hidden tax called inflation, the northern countries had a strong belief that inflation is not only a severe form of social injustice, but also something that cannot be kept under control if abused for state funding.

A huge rule-bound agreement called the “Maastricht Treaty” was set up at Germany’s insistence to force fiscal discipline on the southern countries to prevent them from turning the Eurozone into an inflationary currency space. A “no-bail-out” clause was agreed that made it illegal to bail out bankrupt governments in the Eurozone with either other countries’ money or by printing money.

As the date of the launch of the Euro came closer, markets started – quite rationally – to anticipate that the treaty was merely paper. The markets never believed the no-bail-out story, instead they anticipated that Germany would be the ultimate guarantor of the new system, a belief that was as far-sighted as the aforementioned discord that had been forecast by the liberals. If the markets had put any faith in “Maastricht” they would have swapped the inflation expectation priced into government bonds yields for a default probability. A default probability is the result of a future inability to print money to avoid a collapse in conjunction with the no-bail-out clause.

Nothing of the sort happened of course. Markets saw a convergence of interest rates across the new currency zone towards German levels. Each debtor now had a credit rating that was as good as Germany’s.

Interest rate convergence with introduction of the Euro. ⁵

