

Recognizing When **Black Swans Aren't:**

Holistically Training Management to Better Recognize,
Assess and Respond to Emerging Extreme Events

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This project was sponsored by the Society of Actuaries’ Reinsurance Section and the Committee on Life Insurance Research and the Joint Risk Management Section. The Joint Risk Management Section is a joint effort between the Society of Actuaries, the Casualty Actuarial Society and the Canadian Institute of Actuaries.

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INTRODUCTION

This essay aims to help financial and insurance practitioners better recognize, assess and respond to large-scale, large-impact rare events (LSLIREs), occurrences often wrongly labeled as unpredictable black swans.

The primary focus is on educating practitioners to better recognize LSLIREs by assessing such event's background characteristics, emergence dynamics, logics and other foreseeable attributes. A secondary focus is educating practitioners to better respond to the opportunities—whether to limit damage or to take advantage of—that arise from what others are likely to miss or misjudge during and after LSLIREs.

The goal is to foster better industrywide education, training and practice to decrease the range and scope of events that risk management professionals will henceforth label as being unpredictable black swans. In short, we want to discuss “When Black Swans Aren’t.” This effort is ultimately about building comparative advantage through better practice.

There are, of course, true black swan events: large-scale, large-impact rare events that really are unpredictable using current assessment and forecasting methods.

Nevertheless, Nassim Nicholas Taleb's famous book *The Black Swan: The Impact of the Highly Improbable* seems significantly responsible for overpopularizing black swan thinking to such an extent that it currently supports particular views about theoretical limitations on what is commonly thought to be the realm of the possible. Such views about possibilities and impossibilities thus also guide current practical judgments of best-practice limitations in world affairs' change assessment, in forecasting (or rather nonforecasting) of LSIREs and also in risk management.

Taleb's arguments about black swans are based upon various assumptions and assertions he makes about

- complexity and the nature of change;
- societal driving and shaping forces;
- human and practitioner limitations (even when he is confronted by forecasters' successes);
- using philosophy, history and experience as guidance;
- the limitations of learning and of being worldly learned;
- human cognition limits;
- the hard-deck limitations on the potentials of forecasting art and science; and
- hence, overall guidance of what constitutes best practices.

His scope is breathtaking and conclusions such that it behooves thoughtful professionals to closely examine both. Examining *The Black Swan's* grounding ideas and claims is a transitory task in pursuit of the better practice objectives described above.

The essay proceeds through four subject themes, although the holistic nature of the task coupled with the naturally interpenetrated proclivities of a holistic-thinking style blends them—hopefully well—into an overarching argument where elements of each theme may emerge here and there. These four section themes and associated tasks are:

1. The definition of a true black swan versus what are now almost universally perceived as being such (LSLIREs). This discussion looks at current methods for trying to detect mass-perceived black swan (LSLIRE) events, comments upon why current recognition methods usually fail, and suggests what fostering better recognition, assessment and response may look like.
2. Engagement in a fair but tough-minded assessment of the strengths and weaknesses of Taleb's book *The Black Swan*, with particular focus upon his assertions and proofs about methods, philosophies and operational factors that impact the recognition, assessment and response to what he terms black swan events. The task herein is to separate the correct from the more dubious aspects of his argument, and thereby improve finance and insurance community usages and results. Partly this involves looking at foreseeable first, second to nth order effects of Taleb's claimed black swan occurrences.
3. Having separated, to an improved extent, true black swans from large-scale, large-impact rare events, the discussion next addresses potential solutions to better recognizing (forecasting) emerging LSLIREs, and also suggests ways to better protect oneself and/or seize new opportunities that come during and after either a black swan or LSLIRE occurrence. Commentary is given on the benefits of integrating several recognition and assessment methods to produce more robust and holistic foresight and insight. Also covered is natural system versus human-involved system LSLIRE emergence recognition, with commentary on aspects of typical societal reactions to both types of events. Sounder within and after-event judgment facilitates turning downside risk into future opportunity.
4. Finally, the discussion covers difficult aspects of reducing the uncertainty related to better timing (improved time-scale recognition and assessment) of emerging LSLIREs, and thus of better foreseeing emerging tipping or trigger points (syndrome shifts) within an LSLIRE occurrence, and of using shifting analyst's cognitive dynamics at or near these time points. Analysts' cognitive behavior surrounding an LSLIRE emergence is presented herein as a critical tool for reducing what many now perceive as true black swans to a more manageable large-scale, large-impact, rare-event status: still hard to foresee but certainly not impossible. Comparative advantage again arises here.

This is a difficult and important topic. Nothing in the discussion is meant to impinge upon an appreciation of Taleb's positive contributions to a debate and understanding of true black swan events. The discussion is, however, explicitly meant to build upon those contributions, and thereby improve theory and practice.

SECTION ONE – Definition of a Black Swan

LEARNING OBJECTIVES:

- Learn the definition of a true black swan, and other definitions currently in use.
- Learn cognitive, philosophical/theoretical and practice implications of different usages of the black swan concept and its definitions.
- Review Nassim Nicholas Taleb’s important influence upon this topic and review some professional statements of support and criticism.
- Assess the differences between a black swan event and events that are mass-perceived black swans but actually are not (they are predictable).
- Review current methods for trying to detect true/mass-perceived black swans.
- Review why some of these methods have usually failed.
- Review the state of the art for forecasting mass-perceived black swans.
- Consider what a better forecasting solution looks like.

ON COGNITIVE, PHILOSOPHICAL, METHODOLOGICAL AND BEST-PRACTICE GROUNDING ISSUES

Recognition that perceptual, methodological and standards-of-practice dissonances arise from different cognitive and philosophical framings of a problem, and from the resultant differing approaches used in trying to understand it, is long-standing within the Western academic and scientific tradition. On top of that is concern over differing groundings within other thought traditions.¹

Seeing a particular object/event, and the future of that object/event, via chemistry, physics, biology, economics, politics, socio-culturally or artistically does not arise, per discipline, from the same sort of perception, use the same methods to attempt understanding or yield the same answers. Choosing a cognitive ground, a discipline and its conforming standard of practice methods means choosing a type of answer.²

All methods—models too—are only tools. Each yields one view among many possible views. Appropriate tools presume appropriate-to-task intentions about views.

Also, since every method is a system of bias, an *inappropriate combination* of mindset, method, learning and/or practice rarely yields the correct and harmonious answer.³ This is no less true in black swan/large-scale, large-impact rare event cognition and recognition, and in moving from assessment methods to futures forecasting, than in any other task.

Learning Point: Since each tool is biased, a wise choice of tools and knowledge of the proper situational usages of each tool is needed. One cannot escape the need for sound judgment.

Learning Point: Any single-discipline approach—any model too—is less capable of foreseeing and understanding human-involved complex adaptive system change than is a synthesis of multiple perspectives, cognitions, assumptions and methods appropriate to that situation and particular task.

The psychologist Carl Jung asks, “What will the future bring?” and answers in part that

Any theory based on experience is necessarily *statistical* ... [forming] ... an abstract mean. This mean is quite valid, though it does not necessarily occur in reality. ... The exceptions at either extreme, though equally factual, do not appear in the final result at all. ...

The statistical method shows us the facts but does not give us a picture of their empirical reality. ... Not to put too fine a point on it, one could say that the real picture consists in nothing but exceptions to the rule.⁴

Each such rule’s *exception* is an individual, context-specific and nuanced case undergoing change in its particular way.

This insight is perhaps part of what GE Energy’s risk program leader Frans Valk means when he says, “all models are wrong,”⁵ and also enfolded that to which PricewaterhouseCoopers’ Kevin Madigan points when he argues for “A Healthy Skepticism Toward Models,” saying therein that “the level of healthy skepticism towards their results ... is *decreasing*.”⁶ Decreasing skepticism breeds increasing error.

Madigan paraphrases “The Financial Modelers’ Manifesto” blog by Emanuel Derman and Paul Wilmot with some additional points about models:

- “Models are at bottom tools for approximate thinking.”
- “Models are not the world.”
- One ought “not be overly impressed by mathematics.”
- “The most important question about any financial model is how wrong it is likely to be, and how useful it is *despite* its assumptions.”⁷

This is true of every science and method. The foundation of holistic thinking is knowing that each science and method is a particular bias system useful for approximate thinking from within its philosophical and cognitive biases, that none is the world, and that the important questions for each is how wrong it is likely to be and how useful it is despite its assumptions. From this holistic point of view, no qualitative method is inherently better than any quantitative method, or vice versa, each being only one system of bias that is useful in some contexts.

However, just as Sir Isaac Newton’s and Gottfried Leibniz’s method called calculus advanced problems about judgments involving change within the mathematics realm, just so holistic varieties of thinking (both quantitative and qualitative) that iteratively fold in and *synthesize* results from multiple cognitions, philosophies, disciplines and methods have a sense-making advantage in better forecasting human-involved complex adaptive system change. They retain the arithmetic calculus’ defect that the answer is never totally

correct, just progressively better, and add the humane sciences necessity that variable societal themes and shifting contextual nuances must be understood, usually precluding simple (additive, preweighted, algorithmic, etc.) answers or deterministic thinking, and favoring emergent and entanglement-based thinking. More on this later.

Because finance, economics, insurance, individual and systemic risk assessment, judging the market and similar disciplines are not, despite their tools, mathematical or physical science disciplines, one usually cannot foresee and forecast adequately *solely* with numbers and models. Because they are in fact social sciences, human-involved factors are contextually important. This is at the heart of Jung's comment.

Learning Point: It is not that statistics and models are wrong in any usefulness sense, but rather that every single assessment method, hence each model, frames one biased view into reality, each with very particular cognitive and philosophical assumptions embedded within it.

Importantly, each model is most likely to misguide when it is needed most: at its statistical extremes. This is, of course, exactly where, by definition, black swans and other large-scale, large-impact rare events originate. One insight prefatory to the coming discussion is that the closer to an LSLIRE's emergence one comes, the more certain kinds of qualitative approaches, when combined with arithmetic modeling approaches, yield better foresight, including toward LSLIRE timing.

A second insight, drawn from the realm of futures forecasting, is that holistic approaches are inherently superior to any single-discipline assessment, be it a model or not, first because they endlessly test and enfold more views—more systemically biased assessment approaches, really—in their proffered future forecasting solution, but mostly because they synthesize information from multiple bias systems in an open, iteratively emergent way.⁸ At the highest level, they illuminate syncretism: a shifting of forms.⁹

Learning Point: Before a large-scale, large-impact rare event emerges, more than quantities change as internal and external relationships also qualitatively change.

One way to mind map this is to think of complex systems' states as syndromes. Adam Przeworski and Henry Teune term complex systems change a syndrome change, and notice that a change of one variable can change the whole system.¹⁰ Everything in the system may still be from within that system, but arrangements have shifted, and hence the system itself has changed. Ray Kurzweil, echoing this point, therefore calls himself a patternist, "someone who views patterns of information as the fundamental reality," with his technology forecasting focused upon how, within what enabling societal contexts and when patterns change.¹¹ Guntram Werther similarly uses a kind of iterative, endless loop, and perspective-shifting inquiry termed profiling change processes as part of holistically assessing how and upon what grounds differently biased human-involved systems' achieve syndrome stability, to judge their particular embedded, emerging and entangled change styles and dynamics, and, finally, to forecast their system-specific likely futures.¹²

Learning Point: Best-practice LSLIRE forecasting involves assessing shifting system-specific patterns leading to insights about shifting forms: syncretism. Syncretism as a skill is beyond mere analysis and beyond even synthesis in its orientation to subjects and their changes.

WHAT KIND OF PERSON, EDUCATED AND TRAINED IS BEST AT DETECTING PATTERNS, AND CHANGES IN PATTERNS?

This recognition and assessment question centers first on having judgment plus the correct education/training, and of this Aristotle says that, in a special field, the best judge is the person of specialized education, but “the good critic in general is the man with a general education.”¹³ This general education cannot be a grab bag of facts and fields. Given prefatory judgment ability to think within and across many disciplines, there must also arise an ability to synthesize. In *Five Minds for the Future*, Howard Gardner notices that synthesizing minds take time to develop and are thus relatively mature and experienced before the ability to synthesize well develops.¹⁴ Aristotle required middle age before he would teach politics, just for this reason. Werther says further, “To accomplish—properly, correctly and regularly—a holistic integrative assessment of international change dynamics, and forecasting therewith emerging international change (futures), is to demonstrate a taught skill within a found talent.”¹⁵ For employers needing LSLIRE recognition, assessment and management skills, much can be taught, but the highest-level players are found and mentored. An analogy is that most people can be taught tennis or golf, but few can get to Wimbledon, St. Andrews or the Olympics.¹⁶

Further on, this discussion shows particular skills and learning elements that help most practitioners improve LSIRE recognition, assessment and management skills. For people interested in doing assessments at still higher levels, there are ideas, perspectives and demands that lead to improved large-scale, large-impact rare event recognition art/science, which is a special aspect or subcompetence of holistic change forecasting in general. These too can be highlighted, taught and learned.

More to the point, if teaching and executing effective forecasting of complex events and change were impossible—whether due to the difficult, ever-changing complexity of the world, due to an inherent lack of human capacity to predict complex events well or due to a philosophical and empirical claim that unpredictable black swans order the world—it would be difficult to explain why, for example, particular stock analysts, using the same tools and information broadly available to competitors, can achieve “Best on the Street” status six, seven or eight times each within a career, and do so even in very unsettled times.¹⁷

Throughout history, some people have been recognized as better analysts and forecasters of emerging human events than others. They show particular characteristics.

First, it is clear that because finance, economics and other market-oriented disciplines are social sciences, a broad, general education in human affairs and knowledge/experience of many things is required—*required*—as a prefatory and sunk cost competence. There is no shortcut. This learning can center on an interest, broadly conceived, but is better when it includes knowledge of the world, especially *comparative* histories, philosophies, religions and psychologies, and political, economic and legal systems, and so forth, and knowledge of *how these factors differentially integrate to form their particular societal systems*. In

short, it involves learning most of the Renaissance competencies that are removed from much modern education in favor of specialization.

Broad and deep learning about many things, plus solid grounding experiences in one's areas of interest, is a common feature of people, from ancient times to modern, who have shown special skills by repeatedly effecting correct foresight about emerging change within complex human systems.

Second, topping up on such skills is never ending. It is a life-way and cognitive-philosophical orientation to gaining ever-better understanding, not a static achievement.

Third, doing two-stage thinking leading to both immediacy and to a familiar, personal relationship with the data is necessary. Nobel laureate Daniel Kahneman frames this as *Thinking Fast and Slow*, differentiating the fast, intuitive (system 1) from the deliberative and logical reasoning (system 2) thinking process.¹⁸ Those "accurate intuitions of experts are ... explained by the effects of prolonged practice," Kahneman writes. "After thousands of hours of practice, they come to see the pieces on the board differently from the rest of us. ... Valid intuitions develop when experts have learned to recognize familiar elements in a new situation and act in a manner appropriate to it. Good intuitive judgments come with ... immediacy." He also quotes Herbert Simon, political scientist and economist, "The situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition."¹⁹ Notice how different this is from a plodding kind of analysis or science.

In making this observation, Kahneman is predated a few eons by people, dating from at least Lao Tzu, who understand the necessary-to-foresight relations of intuition, contextual judgment, empirical facts, experience, recognition and *synthetic* reasoning.²⁰

Of this, Confucius famously says he will not continue the lesson when, if he holds up one corner (of a situation or argument), the student cannot come up with the other three. Basically, Confucius is saying, why waste one's time? As against merely attaining knowledge of many facts and the understanding of them, Confucius speaks of having a *string* that holds the many facts together, a point Immanuel Kant also makes for the necessity of judgment serving as a "guiding thread."²¹

Reading the statements and life experiences of serially successful modern analysts of complex events and future change yields the insight that they are not often lost in complexity or randomness. They are instead well grounded cognitively, philosophically, experientially, educationally and judgmentally in their knowledge and understanding.²² They all have a string or guiding thread that ties together knowledge, facts, intuition, experience and understanding. From this nonrandom ground, they assess better than most.

Fourth, having knowledge and having understanding are not the same things.

Jung, like Kant, when differentiating knowledge from understanding, separating the judging of individual fact from statistical fact, says,

I can only approach the task of *understanding* with a free and open mind, whereas *knowledge* of man, or insight into human character, presumes all sorts of knowledge about mankind in general ...

... [leading to] the two diametrically opposed and mutually exclusive attitudes of knowledge, on the one hand, and understanding on the other. This conflict cannot be solved by either/or, but only by a kind of two-way thinking: doing one thing while not losing sight of the other.

In view of the fact that in principle, the positive advantages of knowledge work specifically to the disadvantage of understanding, the judgment resulting therefrom is likely to be something of a paradox.²³

Learning Point: Gain broad general education/experience; do endless learning; do two-stage thinking; differentiate knowledge from understanding; develop “string.”

Sir Isaiah Berlin frames this two-way thinking skill and resolving its paradox as the immediacy a race car driver or expert diplomat will have about an unfolding dynamic situation. He also speaks of them having a personal relationship with the data, that is, having an understanding of the particular context beyond mere analysis.²⁴

Albert Einstein, who famously said that imagination was more important than knowledge, prefaced this by saying of the imagination that “a new idea comes suddenly and in a rather intuitive way. ... But intuition is nothing but the outcome of earlier intellectual experience,” which author Walter Isaacson thinks comes from Einstein’s “deep understanding and knowledge [of theoretical physics] ... and his grounding in philosophy.”²⁵ Einstein was also a history buff and a student of successful people. It is from this broad, multidisciplinary intellectual experience that Einstein imagined. Imagination, Kant similarly claims, is central because “Now, a representation by which an object is given, that is to become a cognition in general, requires *Imagination*, for the gathering together the manifold of intuition, and *Understanding*, for the unity of the concept uniting the representations.”²⁶

Learning Point: No amount of knowledge, and no accumulation of data, facts and relationships alone, can ever solve the problem of more successfully forecasting emerging futures, whether they be large-scale, large-impact rare events, or more mundane emergences.

Lacking the human inputs of correct intuition, imagination and understanding, technical knowledge management approaches such as “big data” and “total information” systems are only about getting better paint and brushes (tools). Likely, they will yield bigger confusion and/or bigger crises. Mastery yet needs better painters.²⁷

The fifth commonality is appropriate *situational* unification of knowledge and understanding—building integrative thinking skills, which leads to context-specific synthesis, even syncretism. These are each, at bottom, judgment skills, as Kant says.

JUDGMENT IMPLICATIONS SURROUNDING THE DEFINITION OF A BLACK SWAN

Earlier, it was mentioned that philosophies, cognitive assumptions, views of reality, and approaches for understanding reality are interpenetrated positions: connected grounds, threads and strings from, and though, which one reasons and judges. Part of such an interpenetrated stance shows up in one's definitions, and the consequents that flow from their use. One definition of a black swan is a prospectively *unpredictable* large-scale, large-impact (extreme), rare outlier event. This usage of the term, joined with claims about human foibles associated in *ex post facto* explanations, was popularized as a financial market and risk management concept by Nassim Nicholas Taleb, who attributes three elements to an event being a black swan: "First, it is an *outlier*, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility. Second, it carries extreme impact. Third, in spite of its outlier status, human nature makes us concoct explanations for its occurrence *after* the fact, making it explainable and predictable."²⁸

Outlier status, extreme impact and retrospective (though not prospective) predictability form the definitional ground of Taleb's now famous 2007 view, although much else is attached to his initial black swan definition, to its financial, insurance, economic and risk management implications and applications, and to his philosophical stance regarding the very possibility of there being a human ability to judge the world.

Others define and use the black swan concept very differently, and even Taleb, after the 2007 publication of *The Black Swan*, "suggests his idea has been misunderstood," according to the Financial Times Lexicon. "The problem, he told the CFA Institute in 2008, is not that black swans occur often. Rather it is that they have truly catastrophic and unpredictable effects when they do happen, and so risk managers should concentrate on guarding against them."²⁹

Yet, before being "misunderstood," Taleb wrote,

A small number of Black Swans explain almost everything in the world, from the success of ideas and religions, to the dynamics of historical events, to elements of our personal lives. ... Ordinary events ... have become increasingly inconsequential. ...

Literally, just about everything of significance around you might qualify [as following these Black Swan dynamics].³⁰

Something that purports to explain almost everything in the world, while making ordinary events inconsequential, demands attention in its own right.

Beyond that, the ongoing praise and criticism from practitioners within statistics, finance, economics and risk management (as from elsewhere), about the truth and usefulness of this variety of black swan thinking demands attention because of the concept's best-practice shaping impacts.

In this matter of practical and best-practice influences, black swan hedge funds are growing in popularity,³¹ and there are now, counterintuitively perhaps, black swan advisers.³² Google and Yahoo searches of “black swan nassim taleb” and “nassim taleb” produce hundreds of thousands of hits. Furthermore, with 36 weeks on the New York Times Best Seller List, translation into 32 languages and over 3 million copies sold,³³ it seems impossible to avoid a discussion of this book if the goal is better recognition, assessment and management of LSLIREs. If a concomitant reduction of what professionals will come to see as being unpredictable black swans is wanted, this discussion is all the more critical.

It is easy to see that a black swan-dominated world is at severe odds with the very notion of an analyst having any worth (if everything of significance is unpredictable), of their performance improvement (if everything, as Taleb argues, is only luck plus retrospective justification), and—indeed—of the very possibility of there being serially successful analysts who can, up to eight times in the 20 years of the survey, actually perform outstandingly correct forecasts so as to be the Best on the Street.³⁴

On the philosophical and cognitive level, the psychologist and Nobel economics laureate David Kahneman said that *The Black Swan* changed his view of how the world works.³⁵ High praise indeed. Others are similarly moved by its arguments.

The mathematician David Aldous counters, “Taleb is sensible (going on prescient) in his discussion of financial markets and in some of his general philosophical thought, but tends toward irrelevance or ridiculous exaggeration otherwise.”³⁶

Erik Nilsson and Joel Westerström, within their project in financial risk, sum the praises and criticisms by quoting the statistician Robert Lund, “Whereas the book is statistically reckless about many issues in our profession, I also find reason to recommend perusal of its contents.”³⁷

Let us then peruse the contents of *The Black Swan*, with the intention of addressing criticism and praise directed at Taleb, and discuss how others use (and misuse) the black swan term and concept, only as a mechanism and a path to furthering the goals described in the introduction. It is a step stone, not more, though an absolutely necessary one to furthering a holistic understanding and better LSLIRE recognition and assessment practice.

THE COGNITIVE AND PHILOSOPHICAL LOADING OF DEFINITIONS AND OF PERSPECTIVES

The black swan concept, under one definition, enfolds events that arise from so far out on the probability tail as to be totally unpredictable; in another definition, they are totally unpredictable using current event-recognition and -assessment methods; and under yet other definitions, black swans are variously defined merely as large-impact rare events *missed by most people* or as large-impact rare events *impossible to model* due to the retrospective data nature of models (see the Glossary for specific definitions).

Among these definitions lies a great deal of cognitive, theoretical, philosophical and practical (and best-practice) difference about what can and cannot be achieved regarding large-scale, large-impact rare event recognition, assessment and response.

There is an obvious labeling problem in that if an LSLIRE is, was or could be foreseen, it is, by a strict definition, simply not a black swan.

Using the term black swan to describe events and highly significant consequences that shape everything of significance, and that *theoretically* cannot *ever* be foreseen, forms a hard limit on the very usefulness of human learning and ability; directs human effort toward seeking resilience and effects mitigation, but not foresight; and supports a worldview to one in which luck and mysterious changes rule. In 2012, Taleb said in a *Globe and Mail* interview, “My whole idea of the black swan is to stop looking for black swans and analyze the fragility and robustness of systems.” He also says he has no interest in doling out specific advice. “I’m into what structure I would like to have for all our grandchildren grown up in,” he said.³⁸ Taleb’s desired new structure for everyone clearly has multiple implications and enfoldes very specific advice that in turn has multiple implications across several realms of human existence, all flowing from a personally chosen philosophical stance. This judgment is confirmed by Taleb’s New York Times OP-ED in which recommends a “decentralized system” like “Switzerland”, among other political notions such as the comment that “Washington bureaucrats haven’t been exposed to punishment for their errors”.³⁹ How one punishes error in an unpredictable black swan dominated and shaped world is not clear.

If Taleb is correct in his unproved assertion⁴⁰ that almost everything in the world is a result of such unpredictable black swans, then ours is essentially that Extremistan (his term) of the pre-Hellenic Greek world wherein unpredictable gods hurled outcomes at societies and humans who are themselves, as Bernard Knox notes, “backing into the future”—they are blind to it.⁴¹ The historian of science David Lindberg concludes of this cognitive and philosophically premodern science tradition, “This was inevitably a capricious world, in which nothing could safely be predicted because of the boundless possibilities of divine intervention.”⁴²

More to the point, within such a view lies a shaking off of responsibility, fatalism toward unknowable outcomes, and a reliance on luck, atomism⁴³ and more.⁴⁴

If black swans are unpredictable and “just about everything of significance around you might qualify” as following Black Swan dynamics, then this must be a short report on state-of-the-discipline improvement: It is impossible. Stuff just drops out of nowhere and your task becomes, as Taleb says, “to tinker as much as possible, and try to collect as many Black Swan opportunities as you can.”⁴⁵

However, to fairly surrender so much, one ought and needs to assess the content of Taleb’s *specific* examples, of his claims and the validity of his supporting arguments to make a just determination on so important a universe of argumentation. We will.

Under Taleb’s definition of black swans and their unpredictable nature, when experts are actually *correctly* predicting rare, extreme events, they are, he claims, merely “empty suits” who are, at best, fooling themselves. Whenever people are doing even normally complex things betokening skill, Taleb says that he “disagree[s] with the followers of Marx and those of Adam Smith: the reason free markets work is because they allow people to be lucky ... not by giving rewards and ‘incentives’ for skill.”⁴⁶

In this kind of world, the god of luck smiles indeed, apparently, on some people we will examine in detail later, such as the serially selected Best on the Street Wall Street analysts who have many times over correctly forecast complex futures.⁴⁷

If Taleb is also correct that black swans are increasingly consequential, so that “almost everything in social life is produced by rare but consequential jumps,”⁴⁸ and that the sources of black swans are increasing, then why and how could, or would, one realistically try to manage for them through structural changes, luck

being the rule in both normal and rare event prediction, and in subsequent successful post-event outcomes?⁴⁹

If too, countering his own definition of black swans as rare, these events are becoming more common, are they actually even still black swans? Or are they just big, rare, important stuff that most people and their models have increasingly missed? How do we know? How does such a philosophical position about risk, understanding, and forecasting fit into Taleb's 2008 CFA Institute clarification? How with his other 2012 statement, "Build whatever political model you want. I don't really care"⁵⁰ when the implications of a black swan dominated worldview are so obviously cross-disciplinary?

Or is PricewaterhouseCooper's Madigan correct that analysts today are simply becoming less critical of models, yielding more errors? Is Taleb's Mediocristan so different from Extremistan⁵¹ that everyone's abilities and methods fail, or are some people just better at forecasting in the latter?

DEFINITIONAL SOLUTION PATHS MATTER

Using the black swan label as it is so commonly used today to describe rare, big, important events that most people missed yields interesting insights immediately. If one can increase the realm, scope and range of people's recognition and proper assessment of large-scale, large-impact, though rare events, one simultaneously reduces the realm, range and scope of occurrences that people will label as black swans.

Second, if most people still think an event is a black swan, while better-trained people recognize it as merely a rare, large-scale, large-impact event that others missed, significant comparative advantage accrues to the latter at the expense of the former.

It all boils down to a best practice as worldview question: Do you think ability matters or do you think it is all luck? It behooves thoughtful people, as well as merely greedy ones, to seek a best-practice separation between that which cannot even theoretically be foreseen—the true black swan event, which does exist—and those instances when black swans aren't, to separate people who see implications, from those who don't.

We present LSLIRE emergence recognition, assessment and management as a special case of futures forecasting, assessment and change management. We think one way to get better overall is to study people who are good at normal-range forecasting as a way to approach discussion of the skills needed to better forecast LSLIREs. Three ways large-scale, large-impact rare event forecasting significantly differs from best-practice normal-time complex systems forecasting is:

1. LSLIREs are farther out on the probability tail than routine forecasting targets; thus, the risk of punishment for deviating from disciplinary, industry or societal consensus is typically far greater, so fewer mainstream people risk it;
2. The timing of an LSLIRE is harder than routine forecasting targets; and
3. The qualitative element of judgment increases in importance in forecasting LSLIREs as the quantitative data become increasingly opaque prefatory to an LSLIRE syndrome shift.

Yet, beyond the normal range of forecasting excellence—way out on the probability tail—there are often people who predicted these supposed black swans while the mass failed.

Part of what this discussion will show is how to use mainstream analyst's failure *dynamics* to one's comparative advantage. Whether the competent LSLIRE analyst wishes to proclaim their nonconformist judgment, accepting the oft-negative consequences, or silently profit, is a personal choice. The task here is to get you to it.

SECTION TWO – Assessing *The Black Swan’s* Worldview—On the Strengths and Weaknesses of Taleb’s Case

LEARNING OBJECTIVES:

- Learn important aspects of strong versus weaker versions of black swan thinking as it impacts of real world change, and the possibility of foresight.
- Learn key elements of connected order (syndromes) versus chance-based thinking, and its basic implications for understanding real-world change.

The purpose of this section is to assess Taleb’s cognitive-philosophical ground, his claims and his evidence, but only as a transitory means to attaining better practice.

Clearly, we have evidence that some people are serially better than others at assessing and making at least normal, noncrisis change forecasts about industries, firms, societies and even global shifts. Others, we will see, are very good at forecasting events that Taleb himself labels black swans, as well as events that most people think are black swans. Some quotes are worth repeating simply because they say so much.

Recall, Taleb says, by disagreeing with “both the followers of Marx and those of Adam Smith,” that free market success is the result of luck and not of skill, incentives or rewards.⁵² Building on the strong claim that luck rules, Taleb advises avoidance of “reading newspapers and watching television” as part of the “further benefits in avoiding the toxicity of information.” For him, “it was initially a great excuse to avoid keeping up with the minutiae of business, a perfect alibi since I found nothing interesting in the business world—inelegant, dull, pompous, greedy, unintellectual, selfish and boring.”⁵³ About even successful forecasters and analysts, Taleb said they are intellectual frauds and empty suits: “My whole idea of the black swan is to stop looking for black swans and analyze the fragility and robustness of systems.”⁵⁴ Based on such, and similar, thinking, Taleb advises that we restructure societies worldwide.⁵⁵

First, how any single individual can become, within a span of 20 years, the luckiest among many thousands of professional peers not once, but six to eight times, becomes a statistical wonder not easily explained by advice to engage in “lucky” black swan tinkering,⁵⁶ but is easily understood as being the result of having superior learning, experience and talent, plus proper incentives and rewards, especially if successful people show us these attributes within their pre-event assessment and judgment processes.

Second, if Taleb’s examples of black swans turn out to have been forecast, his “it is all luck” argument recedes. As it happens, Taleb’s core examples of black swan events were actually not black swans at all because they were 1) correctly assessed and forecast by knowledgeable individuals, 2) explained pre-event on information available *and used* by decision-makers to foresee then-emerging complex outcomes, and/or 3) as, in the famous turkey farm example, the turkey’s black swan event is based on “expectations” and is defeated by using different cognitive, philosophical and analytical groundings than those which Taleb espouses and presents to support his larger worldview. As he so states later in discussing the turkey’s view, “a black swan is relative to knowledge.”⁵⁷

Finally, any advice that dismisses Adam Smith, information, and pretty much the entire history of thought about business, economics, complexity and risk management requires exceptionally strong proofs and overwhelming logics, both of which Taleb lacks. Falsifying his philosophical and exemplar foundations allows building better practices based upon other groundings that affirm, rather than dismiss, examples of successful recognition and forecasting of events that Taleb and others think are black swans.

COMPLEXITY AND INFORMATION LOADS

Granted, information overflows, especially modern mass information such as “big data,” are a problem, but just as you don’t avoid drowning by ignoring the water, you don’t ignore information to avoid error; you learn to swim in it. More particularly, you learn to integrate information amid context, achieve synthesis and, perhaps, syncretism.

It is historically common in large-scale, large-impact rare event emergences that *someone* forecast the LSLIRE—the mass-presumed black swan—when the many did not, that the correct person had solid grounds for their expert opinion and forecast, and—too commonly—that most people ignored the forecast, hence the societal surprise. What is retrospective in this is society’s recognition of correctness, not the correct analyst’s reasoning and actions.

As one example of correct LSLIRE emergence judgments, during and before 1856, the noted expert on America, Count Alexis de Tocqueville, discussed with his closest friends the coming break-up of the United States—what we now call the Civil War - in his numerous letters. Within them, de Tocqueville discusses social, cultural, economic, legal, political and other change factors presaging systemic conflict. Within that correspondence, Count Adolphe de Circourt writes on Nov. 4, 1856, “My dear Sir ... Ticknor is very worried about the nature of public affairs in America. He thinks that during the administration of Buchanan, the breakup will be forestalled and the explosion suppressed, but that with the electoral campaign of 1860, the dikes will be breached and the deluge of blood will cover the North as well as the South.”⁵⁸ The correspondence continues, with de Tocqueville remarking upon the increasing stresses within American society. Correct from four years prior, and not by accident either as a careful reading of the letters reveals. Tocqueville and friends had good reasons across several integrated realms of knowledge for their timely foresight, which is discussed in detail later with other examples of correct foresight and forecasting.

Tocqueville, who’s personal intelligence system of overseas correspondents was as first class as his integrative mind, claimed in his famous study of the 1789 French Revolution, that “the Revolution was much less innovative than is generally supposed. ... What the Revolution *was not in any way was a chance event*” (emphasis added).⁵⁹ He continued, “Not only did I find in its first struggles the reason for what it was to become but, still more perhaps, the forecast of what it was finally to create. ... The Ancient Regime disappeared suddenly in 1789 only to resurface a few years later, just as certain rivers plunge underground only to re-emerge a little further on, showing us the same water but between new banks.”⁶⁰ This “same water, new banks” insight has foresight, recognition and assessment implications for everything from 9/11 to the 2007 financial crisis, to the Arab Spring revolutions and much more discussed further on.

Taleb, remember, calls prospective and retrospective explanation of normal and crisis change fraudulent—experts merely fooling themselves, at best—but getting the Civil War right from four years prior is a hard to explain as fraud; they thought it out and wrote it down prior to the event. Excellent retrospective analysis, like Tocqueville’s assessment of the French Revolution, is needed to know the water and old

banks into which that same water plausibly flows when bounded by new banks; the idea of interpenetrated societal orders moving into new contexts in foreseeable ways.

This particular set of prospective and retrospective concrete examples is presented now because one of Taleb's prime examples of an unpredictable, modern-era black swan event is the eruption of the 1970s Lebanese civil war from what he says is a paradisiacal condition,⁶¹ an argument false on multiple factual and cognitive-philosophical grounds. Taleb similarly says of 9/11, "Had the risk been reasonably *conceivable* on September 10, it would not have happened,"⁶² ignoring the fact that to noted security expert Rick Rescorla, who predicted both World Trade Center attacks, an airplane attack on the towers was far more than conceivable. In fact, he planned on and trained people for exactly that, and died trying to limit loss of life after the event.⁶³ Others, we now know, both in government and out, were focused on a coming major Al Qaeda attack in the U.S.

Additionally, even where Taleb is correct about extreme event occurrences, Aldous says Taleb "wildly overstates the significance of Extremistan."⁶⁴ Aldous comports with Tocqueville's view of same water, new banks, and, as we will see, with the view of others that even after a black swan/LSLIRE, more stays the same than changes, and thus the forecasting of downstream change style and content is possible.

Learning Point: All models and methods are "wrong", but that does not make them useless.

That said, many of Taleb's points about the difficulty of rightly forecasting complex, large-scale, large-impact rare events are correct, as are some of his assertions on the importance and nature of those real black swans as do exist.

Taleb is correct—as many others have likewise argued—that often:

- "Metarules (such as the rule that we have a tendency to not learn rules), we don't seem to be good at getting." (xxi)
- "We lack imagination and repress it in others." (xxvii)
- "We keep focusing on the minutiae." (xix)
- "[The story of the black swan] illustrates a severe limitation to our learning from observations or experience and the fragility of our knowledge. One single observation can invalidate a general statement derived from millennia of confirmatory sightings." (xvii)
- "Go ask your portfolio manager for his definition of risk, and odds are that he will supply you with a measure that excludes the possibility of the Black Swan." (xviii)

He is surely also correct that there is too much focus upon what we do know and too little consideration given to impacts from what we do not know. Taleb is correct too that

- models, including "complicated mathematical models," and other methods of modern science imperfectly measure uncertainty,
- things rarely develop according to human planning,
- complex systems are "recursive" (perhaps even "increasingly so"),
- smart people have been "mistreated by history,"

- we have a tendency to “mistake the map for the territory,” (128)
 - unanticipated occurrences can have “extraordinary cumulative effect,” and
 - “History is opaque. ... There is a fundamental incompleteness in your grasp of such events.”
- (8)

Learning Point: Analysts usually do not adequately learn meta-rules, consider what they do not know, or achieve sufficient skepticism about change.

Aldous,⁶⁵ Nilsson and Westerström,⁶⁶ and others detail some of the above as his positive contributions.

Much agreement and criticism,⁶⁷ perhaps most, is methodological, statistical and science-based,⁶⁸ but, as Taleb points out in his later essay “*The Black Swan: Quotes & Warnings that the Imbeciles Chose to Ignore*,” “*The Black Swan* is a philosophy book (epistemology, philosophy of history & philosophy of science).”⁶⁹

Is it, on that ground then, good work as a defensible philosophy of how the world works and of how we can judge it? Sadly, *The Black Swan*’s weakness is not primarily statistical, but cognitive, and philosophical and, above all it is enfolded in factual error.

TALEB’S TURKEY FARM BLACK SWAN EXAMPLE

Taleb’s self-described “überphilosopher,” used in his turkey farm black swan proof to highlight the inductive knowledge problem, is Bertrand Russell.⁷⁰

Within the philosophy of logic realm, Russell is mostly famous for his ideas on logical atomism, a perspective he rejected later in life; for his nonclassical claim presented in *Introduction to Mathematical Philosophy* that mathematics and logic are identical, supporting consequently his argument against intuitionist and monist positions for understanding complexity and change; and finally, for his work in the philosophy of mathematics.⁷¹ These are justly honored pursuits.

The point herein is that one could as easily nominate überphilosophers from several more holistic or less formally arithmetic traditions: esteemed persons such as Kant, with his insistence upon intuition and judgment as necessary for connecting reason and understanding of the world, and for judging change in it;⁷² Arthur Schopenhauer, with his doubts about purely arithmetic solutions to complex human problems and his directed attack on the Atomists;⁷³ or Johann Wolfgang von Goethe, who said, “Mathematicians are like Frenchmen: Whatever you say to them they translate into their own language, and forthwith it means something entirely different,”⁷⁴ and the German Romantics generally, with their profound doubts about efficacy for human understanding of arithmetically focused empirical science, among many Western überphilosophers.

Any non-Western holistic philosophy too would look at the turkey farm example, and thereby come up with a very different perspective about some of Taleb’s more questionable claims about it being a true black swan case, and especially about such coming-out-of-nowhere black swans as world-shaping agents.⁷⁵

The turkey farm example, simply stated, says that past is no predictor of future. Taleb writes, “Consider a turkey that is fed every day. Every single feeding will firm up the bird’s belief that it is a general rule of life to be fed every day by friendly members of the human race. ... On the afternoon of the Wednesday before Thanksgiving, something *unexpected* will happen to the turkey. It will incur a revision of belief.”⁷⁶

The answer clearly lies in not seeing the world like a naïve turkey. At a simple level, mere situational awareness will show proximate unexplained shifts in operational behavior on the turkey farm pre-event inconsistent with the turkey’s general rule. Shifting system dynamics and contextual analysis are part of a procedure for better identifying LSLIRE emergences with holistic foresight. Police and others subject to crisis emergence call a state of mind that is attentive to changing peril in one’s environment “living in condition yellow.”⁷⁷ It is a chosen cognitive orientation to one’s environment.

For now, knowing historical patterns and context, then seeing the shifting of familiar patterns, perceiving changing contexts, and judging intentions more holistically by shifting among cognitive universes are all methods that defeat the black swan effect of Taleb’s turkey farm example entirely.: No turkey farmer, trader in turkeys, analyst of turkey markets, “butcher”⁷⁸ or even informed citizen of a country having Thanksgiving will see the preholiday event on the turkey farm as a black swan.

No sophisticated analyst thinks so simply, from a single, narrow perspective.

This problem of induction demonstration only works as a black swan example when the following is excluded: analyses that include proper situational awareness, lessons from history, multiple perspectives, cognitive shifting, intuition and insight into multiplayer intentions, their implications and shifting contexts, and other information integrating logics. Synthetic thinking should yield insight leading to foresight of the possible morphing or shape shifting of a system, and of emerging syndrome change.

The turkey farm example also highlights that the closer to an LSLIRE emergence one gets, the more the system’s behavior *qualitatively* changes.

Learning Point: Beware of qualitative shifts!

To let unconsidered data in, a broad-spectrum, multilevel and open-ended folding-in synthesizing approach is more useful than any model or simulation. The end goal here, though, is syncretism: seeing changing forms. We talk about this more later.

For now, note that Taleb’s turkey farm black swan example is easily normalized to an LSLIRE, or even a normally expected event, by some very simple philosophical, cognitive/perspective and analytical behavior shifts. This is very doable for all kinds of perceived black swans to perceived LSLIRE forecasting mindset shifts, including economic and socio-political crises and global change events.

That kind of multidimensional synthetic thinking skill, and not intellectual fraud, is likely why somebody often “gets” so-called black swans.

TALEB’S END OF THE LEBANESE PARADISE BLACK SWAN EXAMPLE

Cognitive and philosophical inappropriateness is one source of missing an LSLIRE and thinking it a black swan. Another is getting the history and facts wrong.

Taleb says, for his second famous black swan example, “Lebanon ... in the early twentieth century, appeared to be a stable paradise. ... The Lebanese ‘paradise’ suddenly evaporated. ... A Black Swan, coming out of nowhere, transformed the place from heaven to hell.”⁷⁹ The implication is that nobody could see this coming. The truth is many did.

Any historian of “The Lebanon” and of the modern 20th century Lebanese state understands that these are very different things, and knows that the Lebanese state was an unfolding crisis from its inception, drawing into crisis various Levantine societies in due course. What follows is purposely⁸⁰ a thumbnail history, available anywhere,⁸¹ followed by implications for doing better LSLIRE foresight and assessment.

In 1926, French-run Lebanon was declared a republic and a constitution was adopted. The constitution was suspended in 1932 due to upheavals, with some factions in Lebanon wanting unity with Syria and others demanding independence. In 1943, Lebanon gained its independence from France. As part of its new constitution, the formation of the government was based on consociationalism, specifically confessionalism, with power shared among the differing religious groups in the area. Social and political unrest continued, until in 1956, faced with an active civil war, Lebanese President Camille Chamoun asked the United States to send troops to preserve Lebanon’s independence. The United States, fearing a repeat version of the conflict in early 20th century Iraq, sent the U.S. Marines, which stayed for several months.

Various Levantine militia groups formed, mostly sectarian, many of which deteriorated to mafia-like organizations in the 1950s to 1970s. During this time, the Arab-Israeli conflicts prompted Palestinians to use Lebanon as a base for activities against Israel, prompting, in turn, December 1968 Israeli raids on the Beirut airport, which destroyed 13 civilian planes. In November 1969, an agreement was signed to control Palestinian guerilla activity in Lebanon, but on April 10, 1973, Israeli commandos raided Beirut, killing three Palestinian leaders. This prompted the Lebanese government to resign the next day. On April 13, 1975, Phalangist gunmen, part of a political paramilitary group formed in 1936, killed 27 passengers, mostly Palestinians, on a bus in Beirut, and this incident is judged the start of the Lebanese civil war.

That is: “The Lebanese ‘paradise’ suddenly evaporated ... a Black Swan coming out of nowhere transformed the place from heaven to hell,” says Taleb.

There are several factual and cognitive objections to supporting Taleb’s black swan claim about the unpredictability of the 1970s Lebanese civil war.

Famously, Donald Rumsfeld once correctly argued that there are known knowns, known unknowns and unknown unknowns, and that the latter are the most problematic. But, as Irish commentator Fintan O’Toole less famously pointed out, there are also “unknown knowns,”⁸² facts that are well known, but you don’t know them. Taleb’s problem seems to be the latter.

A fair assessment of black swan versus LSLIRE designation must rule out the former when other people know it, and the analyst claiming a black swan does not know, or does not want to know—that happens too—the particular facts of a case.

More technically, using Taleb’s own advice from *The Black Swan*, the Lebanese case clearly involves knowing metarule lessons, which knowledge he does not show here, about the inherent instability of

confessional and consociations states, and knowing that these rules are well understood and examined in mainstream social science literatures beginning from the late 1800s. Likely, no expert, and few people knowledgeable about the 20th century Lebanese state, thought it was stable, much less paradise.

As a cognitive shift exercise tending away from black swan assumptions, why build a sectarian quota system into parliament in paradise? Why form sectarian political parties and mafia-like militias in paradise? As a historical and foreign policy practice lesson, the U.S. Marine intervention explicitly was to prevent a feared dissolution, and was informed by experience of other confessional and consociational instability crises, especially early to mid 20th century Iraq, as a reading of the press at the time, Christopher Catherwood's *Churchill's Folly* or David Fromkin's *A Peace to End All Peace* will make clear.⁸³ Strategically, Israel was not repeatedly intervening because Lebanon was paradise, and the Palestinian guerillas were not using paradise as a safe haven.

Clearly, using then-existing reasoning for actions, specific known mainstream literatures and easily available news of the time, broad-context assessment and some situational awareness, one can easily falsify the “coming out of nowhere” claim. Many people saw Lebanon's crisis coming. Because 20th century Lebanon was an embedded and entangled system with contemporary and emerging known complexities, the “Black Swan transformed the place from heaven to hell” claim collapses.

Likely, without further skills, an analyst would have missed the exact trigger—shades of the Arab Spring revolutions in 2010-11—but not the emerging problems.

Most of Taleb's other black swan examples are of this type. About his more recent reputed black swans, it is clear 9/11 was not that. Of financial crises, Professor Nouriel Roubini foresaw as early as 2005 a speculative wave that would soon sink the economy, while Nye Lavelle formally complained in 2006 to Fannie Mae about the housing crisis that precipitated the 2007-08, and ongoing, financial crisis.⁸⁴

Taleb's position, as stated in various colorful ways throughout *The Black Swan*, is that successful insight, foresight, forecasting and assessment represent luck, intellectual fraud and impossibility.

But forecast impossibility is only part of Taleb's *The Black Swan* thinking, and perhaps not even the most critical part. Is it true that “our world is dominated by the extreme, the unknown, and the very improbable”? (xxvii) That “indeed, the normal is often irrelevant”? (xxiv) That “almost everything in social life is produced by rare but consequential shocks and jumps”? (ibid.) That “*what you don't know* [is] far more relevant than what you do know”? (xix) That “*the inability to predict outliers implies the inability to predict the course of history*”? (xx) That “*all [events] follow these Black Swan dynamics. Literally, just about everything of significance around you might qualify*” (emphasis added)? (xviii)⁸⁵

If Taleb is correct about his *main points*, the *meaningful* stuff not only just drops on us unpredictably as black swans, but then this black swan-dominated world—a core Taleb claim—becomes like the crazy-making world of *The Pink Panther's* Inspector Clouseau—unexpected, unpredictable extreme Cato Fong events constantly springing up from out of nowhere so that the best one can do is forever cope with the unpredictable and gather as many black swan opportunities as possible.⁸⁶ The normal, he claims, is often irrelevant, and social life is produced by shocks and jumps.

Alternatively, one can choose to follow other cognitive and philosophical groundings, other überphilosophers, toward assessments that are more learned, experiential, integrative, even holistic and that lead to synthesis and syncretism as ways to better perceive change and emerging futures.

Learning Point: Black swans happen, but they are far less consequential to subsequent change than Taleb asserts.

Learning Point: Embeddedness, entanglement, emergence, iteration, and connected orders (syndromes) are better ways to understand societal systems' change than are randomness, chaos or chance.

Choosing this latter path is not perfect, but we are not about perfection. We are merely about teaching and facilitating comparative and competitive advantage through the building up of knowledge, understanding, good intuition, and scientifically valid, empirically grounded, yet art-like hindsight, insight and foresight about the emergence of large-scale, large-impact rare events.

SECTION THREE – Moving Toward Solutions That Better Forecast Large-Scale, Large-Impact Rare Events

LEARNING OBJECTIVES:

- Get exposure to the attributes of serially successful analysts, their practices and perspectives.
- Achieve a more nuanced sense of the use and usefulness of failure.
- Gain a prefatory understanding of holistic perspectives and how they aid in LSLIRE recognition and assessment.

EXPERT'S JUDGMENTS

The *Wall Street Journal* ran this front page story “Stock Rally Snags on Gloom: China Cuts Rates, but Investors Worry About Limits of Central-Bank Actions,” with the lead “A global stock-market rally lost steam Thursday as investors considered the limits of central banks’ firepower to brighten a dimming economic outlook.”⁸⁷ Shades of crisis!

But how can anyone know such things? This could be right, or not.

Apparently, between Thursday’s “global stock market” closings and Friday’s newspaper deadline, it was somehow determined that “investors” worried about the “limits of central-bank actions,” and that their “gloom,” but not anything else within the endless global flow of facts and information, “snagged” a rally despite said investors being “initially cheered” by China’s central bank decision to “cut rates.”⁸⁸

Taleb is at his best when he points out that much of what passes for expert judgment, whether about rare events or routine ones, does not bear close examination. His claims about the precarious nature of ways of knowing are largely true.

The larger claim within this particular example of a common motif involving factual news explanation is that if correct leadership judgments are not made within the context of a deteriorating economic situation, “significant risks” accrue to this or that country, region and the world economy as a whole.⁸⁹ Is an LSLIRE coming, or not?

A common complaint, after hearing why and how some people are excellent, is that becoming so is a lot of work involving endless learning in unfamiliar areas. The hearer claims not to have the time or wants a simple, clear math-based tool or algorithm, or at least a clear, generic method. However, making a wrong, but routine, judgment, whether about a stock, an economy or a country, involves work too; probably yours, and definitely the product of someone else’s. PwC’s Madigan made the claim that models and methods “are not the world” and that to do better work “you must start with models and overlay them with common sense and experience.”⁹⁰

Learning Point: Being excellent, even in familiar waters, is serious work.

On the LSLIRE emergence recognition scale, where losing trillions of dollars, collapsing companies, economies, even societies, or not winning wars because of a failure to adequately understand the specific complex system at issue, the work of foreseeing such events is serious too. One difference is that here, to even get in the game, you must start with broad, trans-system common sense and experience, and use models and herd-like analyst consensus in a very uncommon way, since far, far out on the statistical tail, at rarity, is just where models and most analysts routinely fail.

Between case-normal change and crisis (LSLIRE) recognition, assessment and forecasting lies trans- or intersystems assessment and forecasting. The primary feature of this middle area is that the needed prefatory familiarity includes the makeup of different human-involved complexes (societies, cultures, countries) that are not your own and their differing normal behaviors in addressing internal and external change pressures. One also needs to know how the complexes normally interact with each other. Therein is a string (or thread).

All human-involved systems are constrained, shaped, embedded, entangled—they are not legacy free—and thus their expected and normal behaviors can be change profiled. Interactions, though complicated, are also not legacy free and can be change profiled.

Learning Point: You cannot recognize a rare event if you don't recognize what normal looks like in each different complex system, and among them.

Machines help in accomplishing this, but humans decide. Countering this point somewhat, Kurzweil argues that advances in computing technology plus advances in learning agent model sophistication will lead to a singularity of human-machine thinking, where “If you just look at the rate at which they are getting better, the crossover is about 2029. My prediction all along has been that computers will be able to deal with the full range of human intelligence by 2029.”⁹¹

If such better machines and better models exist, *and they are understandable to people*, by all means use them. Some serious difficulties are likely to remain because the meanings of facts and of patterns are usually context-specific, especially when different systems are interacting. But more importantly, since many factors (soft and hard) are brought to bear in recognitions and when forming judgments within specific dynamic contexts, and because each factor's meaning and relevance moves to foreground or background depending upon theme, machine intelligence answers will likely still need sophisticated human intelligence to interpret output meanings. As a visual, giving a Stradivarius to an average musician is simply an average musician with a Stradivarius. A practiced musical genius with the same instrument is another condition entirely.

One recent experience with high-speed trading models is that while the models gave mostly “correct” answers amid occasionally wildly wrong ones, no human knew what was going on in either case.⁹²

The high-speed trading models were effectively black boxes, which could lead to unknowable black swan-like outcomes. Likely, the more society uses machines to *do* assessments and judging, versus using machines to *aid* in making better assessments and judgments, the more this kind of scenario will play out.

The idea is to facilitate black swan reduction to LSLIRE status, not argue over whether machines or humans are better at being blindsided. Let's look at people who succeed better than most, and learn some lessons about how this can be accomplished.

NORMAL INDUSTRY-LEVEL FORESIGHT AND ASSESSMENT AT EXPERT LEVELS OF ACHIEVEMENT

The serially recognized Best on the Street⁹³ experts, those who were honored in the competition two to eight times each, are all, to one degree or another, older *within-system* patternists.

Many single-honoree analysts show the same traits but are excluded because, as also previously noted, winning once can be luck; being judged the best six, seven or eight times pushes the luck hypothesis. Serials exhibit, or attribute, success as follows.

Mark Weintraub (47, an eight-time Best on the Street honoree), in making his 2011 judgments, spoke of other's mainstream outdated perceptions within a multiyear assessment of his industry. Thus, "investors were stuck in an old mind-set." He saw favorable industry and international trends coupled with "dramatic structural change going on where producers are managing supply better than in the past." Weintraub has covered the paper industry since 1994 within the general industrials sector.⁹⁴

Mike Linenberg (41, eight-time honoree) has been interested in his industry since youth, worked in it from 1992, first as a investment banker, then as a stock researcher, before becoming an industry analyst. He claims that his "inside-out knowledge of the industry helps him hone in on broader trends."⁹⁵

"Taking that data point [global recession survival and "positive free cash flow" in five of the past six years] and the industry's general restructuring in recent years, Mr. Linenberg sees a sector that could be 'on the cusp of investability,' " Brian Hershberg writes.⁹⁶

Bob Glasspiegel (56, eight-time honoree) has been an analyst since 1981, switching to insurance analysis from a mutual-fund firm covering technology stocks. He has deep connections in the industry, but speaks of "trying to zero in on the important variables," explains macrolevel industry "difficulties" "industry headwinds"and speaks of their implications for the microlevel operations of various firms. In explaining this, Glasspiegel speaks of how he "scrutinizes industry data closely; talks to brokers, agents and other sales people; and draws on a long list of former company executives and employees for insights," and he judges that firms/industry "are facing the same difficulties as last year."⁹⁷

Each eight-time honoree shows a thinking style of integrating, with context specificity and also across time, macro-, micro-, firm-specific and industry trends, within their industry's changing contexts. Weintraub and Glasspiegel also each reference cognitive or psychological, and metastructuring insights. In Glasspiegel's case, he also tries to "manage the time to zero on the important variables," which is similar to Linenberg's explanation, where he tries "taking ... data point[s] and the industry's general restructuring in recent years ... [and] sees a sector that could be 'on the cusp of investability.'" Both try to figure out which variables or data points matter within the larger emerging context for correctly timing a judged coming change that is itself grounded within their understanding of "broader trends" (Linenberg) or macrolevel "difficulties" (Glasspiegel). Each shows deep and specific industry/firm knowledge, integrates it (synthetic thinking), but also speaks in terms of form changes. This is syncretism, seeing the forms change. Glasspiegel and Linenberg reference their multiple jobs and experiential backgrounds.

John A. Baugh, (51, six-time honoree) integrated macro-economic U.S. and European trends analyses, multiyear sector-level market analyses, psychological and microlevel changes in consumer confidence, and changes in consumer's willingness to spend, which was seen to be grounded in their specific changing psychologies and their conforming observable shifts in purchasing preferences. Therefore Baugh speaks of "consumers gravitating" toward particular products. This gravitating, Baugh linked with specific company-level operational changes, and he even includes a judgment on the "favorable impact" of Brooke Shields being used as a marketing tool, to make his correct, and correctly timed, pick. In this evaluation process, Baugh "frets that some companies in his sector have seen large stock appreciation and may be ahead of near-term fundamentals," and he compares companies on their particular choices, and then argues the implications of this within his larger views. Baugh's assessment and foresight style shows the same recursive top-to-bottom, multilevel, multidiscipline, cognitive-psychologically referenced integrative and dynamic thinking style used by the eight-time winners.⁹⁸

William Bird (46, three-time honoree), says of his correct judgment and "sober view" that, "Where I differed from the market was the degree to which [the target firm] could lift earnings and overcome the structural pressure." He speaks of industry-level "convergence" and of "crowding out" effects—all qualitative judgments showing emerging trend recognition more than quantitative data analysis. He previously worked in media stock research, as a buy-side generalist, "before returning to the sell side," and then becoming a senior analyst in his present job.⁹⁹

Jed Dorsheimer (38, two-time honoree), takes particular pride in his ability to see the landscape and correctly call the peak and trough," Hershberg writes. Dorsheimer "first tries to determine the macroeconomic environment that would have an impact on a particular industry ... then he'll look to see which companies might outperform or underperform based on various performance estimates. "He then slots them roughly into categories of expected performance over the course of a year and rates them buy, hold or sell." ¹⁰⁰

Among the two- and three-time winners, one sees the same top-to-bottom, multilevel, multidiscipline kind of thinking, and notes attempts to integrate multiple factors to "see the landscape" (Dorsheimer) or get a "sober market" level view (Bird), into which the particular firm's judged future performance is placed. The words embedded and entangled would properly describe this kind of thinking and integrative analysis, with firm-specific futures judgment emerging thereby.

In all cases, there was a willingness to go against the consensus, to nonconform.

Mike Mayo (49, two-time honoree) who is said to have "turned nonconformity into a commodity," was fired after a call "that turned out to be correct." He speaks of his being "willing to be critical of pay, accounting practices and inflated expectations," and says, finally, that "he no longer fears the repercussions of a controversial call. 'I can speak up, and I have a record.' "¹⁰¹

Willingness to nonconform is critical to LSLIRE recognition expertness. Later we show why and how.

COMMON FACTOR DISCUSSION OF INDUSTRY-LEVEL CHANGE RECOGNITION AND FORECASTING

Age: Serial Best of the Street winners are ages 38, 41, 46, 47, 49, 51 and 56, with Linenberg, 41, by far the youngest of the six- to eight-time honorees. However, Linenberg explains that "his affinity for the [aircraft]

industry began in youth ... [when] he made some small investments ... with his mother's help." Aircraft were, and are, his hobby. This increases his experiential time in the industry.

As previously said, people skilled in synthesis are, according to Gardner, author of *Five Minds for the Future*, on average older simply because it takes time to accumulate the knowledge and experience base to synthesize from. Aristotle, recall, would not teach politics to people until they were middle aged for just this reason.¹⁰²

Learning Point: Excellence in understanding complex systems and forecasting is a sustained, sunk cost enterprise with endless topping up, and it comes with time.

Had a Psychological Perspectives and Cognitive Foci: Knowing why something works is at least as important as knowing what is happening and how, especially in different human-involved, thus differently shaped and maintained, complex systems. Knowing why it works this way within this specific context, as opposed to another way in different contexts, is a high level of mastery. This has "big data" and machine trade implications.

Learning Point: Master multiple perspective thinking and analysis from different cognitive assumptions, especially integrating soft psychological, sociological and philosophical perspectives and their changes with the hard data.

Find, Don't Predetermine, the Relevant Context-Specific Variables: The proper thinking process is open, emergent and essentially archaeological: Facts and patterns emerge to your understanding as you iteratively scan, dig, assess and judge. This is an investigative frame of mind, rather than being merely analytical. Analysis is only part of investigation. Methods and models are investigative tools, not decision points.

Learning Point: Don't predetermine or prejudge which variables are context relevant. Think like you drive and live: constantly integrate and reconsider.

Macro-, Micro-, and Industry-, Firm- and Context-Specificity and Change Insight Integration: Things exist within particular contexts and are shaped by them. They are, in any particular societal system, neither free, nor random, but advantaged and/or constrained in knowable ways. This embedded and entangled system legacy can be profiled.

Learning Point: See the fit of things, and from this, better judge their potentials and limits, possibilities and impossibilities. This is profiling more than modeling.

Multiple Experiences and Jobs: Multiple experiences are a cognition and perspectives multiplier, enhancing mindset flexibility in future fact placement and context recognition, and are a change processes recognition enhancement aid. Since no complex human-involved system has only one way to see it or understand it, multiple personal experiences and capacities improve comparative abilities in recognition.

Learning Point: Most excellent complex systems forecasters have varied, rather than specialized, learning, work and experiential backgrounds.

Skepticism: Human experience shows that it is usually easier to promise to do something than to do it; to try something, than achieve it. That means that the desires, goals and, above all, the change agendas, of actors, whether they are governments, firms or persons, are to be treated with skepticism. Each of the serial experts explained why and how a given change or accomplishment was likely to occur.

Learning Point: Human-involved complex system's change shows specific, but different-among-systems, recursively embedded and entangled change process characteristics. If you cannot foresee a plausible and likely path, you are wishing and/or guessing.

The Courage to be a Contrarian: Members of a herd follow the thing in front of them. To see the landscape, you need to be free of the herd while keeping the herd in mind. To navigate the emerging landscape—the future—you need to understand what was, is and likely is coming, why and how, and use synthetic ability and syncretism to form and defend a judgment.

Hershberg writes,

The best analysts have proved to be those who advise investors to buy or sell a stock before the pack. They've also been the ones who will go against the grain.

Stock analysts tend to move in the same direction. For good reason: An analyst needs near-absolute resolve to go against the pack, especially when being bearish. Companies hit by negative ratings can make needed access difficult. Other analysts will also sometimes take the outlier to task. A wrong sell call and a reputation can end up in ruins.¹⁰³

Learning Point: A serially best analyst thinks independently, and this often means being contrary to the herd while knowing where the herd is.

AVOIDING BEING A CASSANDRA BY USING NORMAL METHODS, NORMAL ANALYST'S PERCEPTIONS AND MAINSTREAM FIRM BEHAVIORS TO GROUND YOUR LSLIRE JUDGMENT

If ruin is common for being correct during normal event recognition, imagine the personal, career and reputation risk for correct extreme event recognition, assessment and forecasting. Becoming roadkill is not a useful career outcome of getting better at LSLIRE foresight. Besides, producing just another batch of experts who are ignored and/or punished is not a useful outcome of this discussion. The goal is broad-spectrum industry improvement that transforms perspective on what is possible and is professional best practice. The hope is that some professionals will seriously take up the task, and that the many will get somewhat better at it.

Learning Point: The herd-like behavior of analysts and their linked near-event failure to foresee the emerging, changing landscape is very useful in helping illuminate an emerging LSLIRE and in helping time the event's trigger point (discussed in the next section).

Learning Point: You must have, or develop, the courage to judge herds and think independently of herds to be any good at LSLIRE recognition—period.

While it is important to study experts' ways to get better, one cannot rely on or use expert judgment to believably forecast LSLIREs. Besides society's natural tendency to protect the status quo and stick with what normally works, it is a curse to expertise that society does not know which expert is going to be correct in any particular case until after subsequent events prove them to have been correct. Often too, their message is not welcome. Thus, we study experts and herds mostly to recognize moments of herd failure, and only partly to improve the herd's behavior. LSLIRE recognition and assessment is shamelessly an activity of people who strive for excellence, and are willing to do the sunk cost work to attain and maintain excellence. Excellence needs and uses herds.

Learning Point: You need to do LSLIRE recognition in such a way as to avoid being a casualty of the tendency of any system to protect the status quo. This tendency favors using mainstream models, methods and analyst's judgments creatively, but also means not explaining yourself overmuch.

Learning Point: Live to fight another day.

CHANGE RECOGNITION IS ABOUT FAMILIARITY, AND LEARNING FAMILIARITY IS THE GAME

Normal change recognition, assessment and forecasting operate via an understanding of the constrained ways of things. Successful analysts show deep study across those realms of knowledge that can normally impact their topic of interest. Such experts are better grounded in what political scientist and economist Simon calls "recognition" and therefore are better at judging "cue" potentials, says Kahneman, with

“immediacy” because their prolonged practice allows them to “see the pieces on board differently from the rest of us.”¹⁰⁴

A second difference is that within-system expert analysts and forecasters are solidly grounded in the study of their relatively narrow form (complex or system) and its change patterns, whereas between-system analysts and forecasters obviously need understandings about and between multiple systems, and their unique perspectives, goals and potentials. To put it in Kahneman’s and Simon’s language, they see multiple boards differently and have a broader realm of recognition, including historic context lessons. They integrate across the different boards, and synthesize at meta-, macro- and microlevels both within and across them. Obviously, this is a different kind of learning.

LSLIRE analysts and forecasters are merely a special kind of within and among systems *comparative* patternist. Because their interest is in large-scale, large-impact rare event recognition, assessment and management, their principle focus is more on change processes, on the profiling of change processes, and ultimately on recognizing syncretism (changing forms) within and among different systems. Although this comparative skill is still only one of recognition, in Kahneman’s, Simon’s or Berlin’s “beyond analysis” sense of that term, it is quite differently focused, and requires more two-stage, in-out and recursive thinking to see the changing of patterns. In a real sense, it is the study of the repatterning of established patterns. Perhaps one can call it comparative syncretism, the study of changing forms.

APPLYING WHY FORECASTING EXPERTS ARE PATTERNISTS: THE PROBLEM WITH FACTS

One problem with the facts is that there are too many of them, each embedded in dynamic, adaptive complexity, with some facts more *contextually* consequential for understanding individual to organizational to system’s change interactions, stability, instability or crisis than are others. The fact’s usefulness varies temporally, hence varies as emerging context. What was inconsequential just prior context now perhaps becomes critical, whereas the previously consequential is now barely needful, and only dimly useful in foresight. No singular fact or group of facts will give that kind of insight. Recognition here is thematic, comparative and artful as well as scientific; it involves seeing the unfolding play with philosophical, cognitive, historic, generic and case-specific understanding.

The current news makes it easier to point out that any individual datum, even an important metric like LIBOR,¹⁰⁵ is far easier to “make fit” an interested party’s preference, than is a pattern, or a group of patterns. Trusting an individual fact is an exceedingly dangerous thing since some self-interested person always created it, whereas patterns accumulate from multiple, differently biased sources and methods, and thus are far harder to “cook” to anyone’s preference and, once “cooked,” to maintain over time.

It takes little knowledge about human psychology or history to know that when self-interest favors the appearance of a certain number, that number will tend to appear. A set of such datum, the bad mixed with good in unknowable ways, can rarely *directly* yield the correct answer using one method. It is no accident that the serial Best on the Street analysts integrated psychology and other human factors with many technical ones to win.

Similarly, sophisticated scientists, mathematicians and statisticians know that models, even if the data are all accurate, are not the real world, yielding the best reason for analysts in mathematical, statistical and

technical fields to read history, psychology, philosophy and biography. Einstein did. In fact, he recommended biography, history and philosophy as the best ways to build a creative mind.¹⁰⁶

Even given *all* the facts, it becomes harder still, not easier, to know which fact(s) matters when, how, why and in what morphing context. This is why total information awareness approaches—big data on steroids—cannot solve human-involved complex adaptive systems foresight problems for even normal system crisis, let alone LSLIRE emergence. Something is needed that simplifies, clarifies, is sensitive to *this* specific, adaptive context and to *its* emerging shifts, *and* does not lose *or prechoose* information.

Models prechoose variables of interest to someone, as do other analytic constructions wherein the builder of it preselects fit elements for the futures assessment. These constructions typically fail when needed most, when something is actually changing.

This also is why Kurzweil views patterns of information as the fundamental reality, and says he is a patternist.

Learning Point: Philosophically, cognitively and operationally, this choice to focus upon patterns first, and facts only within their context, is critical.

It is impossible and operationally useless to know all the facts, but natural to learn and experience patterns, and relatively easy to see deviations from patterns. The issue is having intimate familiarity so that recognition of a deviance is possible, even likely.

Your cat is a patternist; move one thing in its familiar environment and watch the immediate behavior shift. People are patternists in normal life too, when driving a car, flying a plane, walking or working, for if they were not, total information overflow, or worse, a preselection of which limited variables to watch, would crunch their endeavors.

In emergent LSLIRE-prone environments like driving a car or flying a plane, it is usually constant macro-to microenvironmental recursive interrogations, and whole-system pattern scan *deviation*, not variable preselection, that first signals a coming crisis. Something doesn't fit an expected pattern, and this embedded observation focuses interest so that, using familiarity and experience plus judgment, action follows recognition. Notice that deep understanding is not necessary at this stage to achieving potential crisis recognition.¹⁰⁷

Learning Point: Assess like you live, walk and drive: as a holistic patternist.

LEARNING WHOLE SYSTEM CHANGE AND EMERGENT FUTURES RECOGNITION AND FORECASTING

It is fairly characteristic, as Berlin said, that a great diplomat sees the implications of a particular new fact or trend within *this* context—usually the same fact or trend that others have access to—with an experiential familiarity and immediacy.¹⁰⁸

In the best description of such intimate foresight ability that I know, Berlin writes,

We speak of some people as possessing antennae, as it were, that communicate to them the specific contours and texture of a particular political or social situation. ... To which experience is crucial. ... We mean something perfectly ordinary, empirical, and quasi-aesthetic in the way that it works. ...

... a capacity for integrating a vast amalgam of constantly changing, multicoloured, evanescent, perpetually overlapping data. ... *To integrate in this sense is to see the data ... as elements of a single pattern* [emphasis added], with their implications, to see them as symptoms of past and future possibilities, to see them pragmatically.¹⁰⁹

Learning Point: Grow antennae. Learn to recognize things and processes in environments other than one's own and among different interacting environments.

To eventually better foresee international and comparative systems' change, Werther suggests "a broad knowledge of comparative values, religions, philosophies, traditional ways of relating; studies in societally validated goals and strategies; interpretations of political and historical reality, etc." as useful skills. As shown in Figure 1, this should lead, with experience and time, to an ability to build a "societal behavior/values profile (continually updated)," which helps do better "comparative evaluations of societies [and their] reactions to change pressures and processes." This ability is integrated with a "societal change profile," and finally applied as a specific case judgment, which clues contexts, details and interrelationships that matter.¹¹⁰ This is Kahneman's experience of the board.

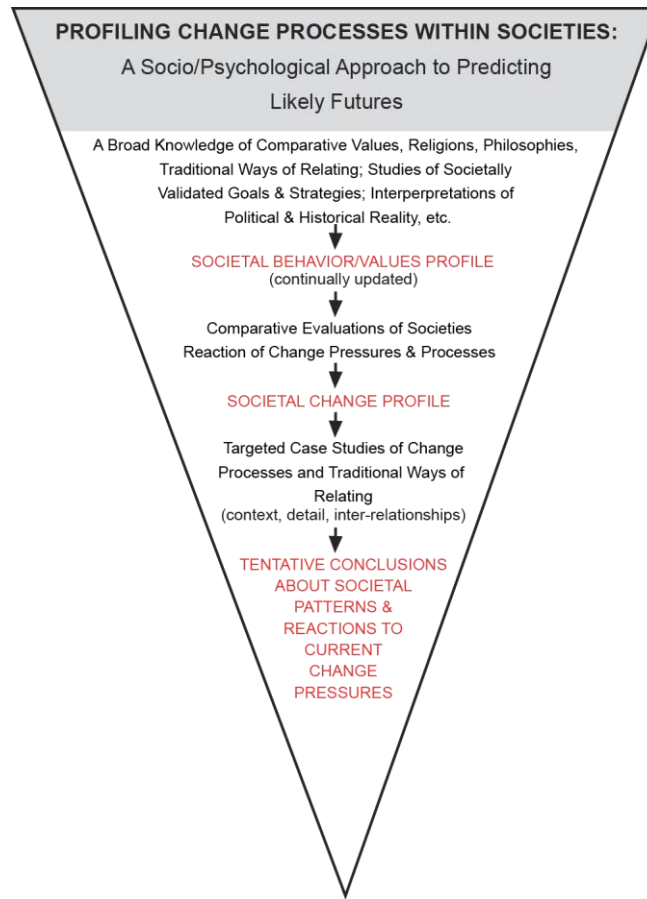


FIGURE 1

Learning Point: If knowledge of the “board” is critical to attaining expert judgment and foresight, then the characteristics and nature of each relevant “board” influences what understanding must be accumulated to gain expertness. This suggests that nobody is a good prophet everywhere but only in familiar areas.

But LSLIREs and black swans are, by definition, rare and relatively unfamiliar areas to everyone. Broad and deep knowledge and understanding of similar boards is prefatory, but getting better at foreseeing a particular rare event emergence also means, counterintuitively, using some *details* of the failures of normal methods and normal analysts—using herd consensus point-of-failure—in positive, insightful and creative ways. These details, and their uses, are next discussed.

SOME TECHNIQUES OF PRE-EVENT NORMAL CRISIS PATTERN CHANGE RECOGNITION

Almost simultaneously, Jack A. Goldstone (March 2008), working with the United States Institute of Peace,¹¹¹ and Werther (January 2008), in his Office of the Director of National Intelligence funded and published work,¹¹² arrived at very similar conclusions about the necessity of using a multiple-methods

approach to provide early warning of system change. Both did so using multiple qualitative and quantitative methods in arrays, then constantly iterated among them, polled output changes and triangulated to foresee an emerging system's dynamic *pattern* shift, especially where "herd consensus almost always lagged behind events."¹³

There are differences in the specifics of the approaches, with Werther preferring a socio-psychological grounding to study how differently biased systems uniquely act and react to change pressures, while Goldstone relies on a political-economic forces view. Goldstone seems more in the forces tradition of Harvard Business School's Michael E. Porter, whereas Werther follows the syndromes-shifting mindset suggested by University of Chicago's Przeworski and Teune. Readers are invited to study the original works for details. Highlights follow.

Taken together, these approaches are also very useful in foreseeing second, third to nth order effects of change. That is, these approaches are useful beyond mere recognition and lead to understanding implications.

Approach 1: Use Multiple Methods Arrayed Around the Assessment Target

Recall, all methods bear weaknesses, biases and errors, but different methods bear different weaknesses, biases and errors. Used as arrays, or as accumulations of many different qualitative and quantitative methods, the multiple of these different methods "patterns" a system quite well during normal times, but more importantly, each fails differently during *emerging* abnormal times.

Because each method, whether qualitative or quantitative, has different cognitive abilities, assumptions, strengths, weaknesses, errors and so forth built into it, each reads the system differently. The point is that during periods of relative stability, singly and together, they more or less accurately predict *pattern stability* and forecast *its* future somewhat.

During periods of impending and significant system dynamic's change, whether crisis (Goldstone) or harmonic path perturbation (Werther), each of the individual models and qualitative methods fail differently. However, if they are decently created, they fail more or less around the same objective normal to new change process that is emerging within that system, though this change process is now seen as and from different aspects. This resulting dynamic array of method failures can be used to recognize impending system instability and triangulate, using iterative polling of the many different method's outputs, on underlying, even causal, issues.

Learning Point: Learn to creatively use failure. The error term of each method is the most interesting. Recall Madigan's comment on this kind of usage.

Approach 2: Triangulation and Patterning Emerging Change

There are, then, two uses of triangulation. The first is to provide simultaneous empirical data from many methods, both qualitative and quantitative, that *something* out of the ordinary is happening at systemic levels. With work, triangulation at this level gives general readings on what that something likely may be.

The second usage is more profound. Just as the calculus gets one closer and closer to the arithmetic truth of change, iterative polling of many arrayed methods over time and iterative triangulation of their deviations

from former readings of system stabilities can highlight *general* emerging system path dynamics, both as to type and direction. Hardly ever does this help on timing (more on that in the final section) or yield specifics.

To find out what is going on within the system with decent specificity, qualitative methods and, more particularly, socio-psychological and “historical” understandings are needed. The same datum can mean radically different things in different contexts and times. With themed understanding of the embedded and entangled features of that particular human-involved complex system (group, culture, society, state, etc.), and with understanding of how it normally changes, aspects of the shape of emerging change—second to nth order—can, within reason, be foreseen. This is what Tocqueville was talking about when seeing the shape of what the French Revolution was to become from its earliest stirrings: the old water flowing within new banks.

Learning Point: Triangulation of suddenly deviating multiple method outputs provides one kind of warning of an incipient large-scale pattern change.

Learning Point: Repeated triangulation and polling of multiple methods against their normal readings can illuminate type and direction of change.

Approach 3: Folding In and Layering the Onion

We said earlier, a core technical forecasting approach is an avoidance of predetermining the facts and variables to be studied. Both are endlessly folded in as they archaeologically arise, to yield simultaneously broader and deeper understanding of normality and normal change processes for that system.

The visual, Figure 2, is “layering the onion,” with new datum, patterns and context understanding constantly folded in to the pre-existing. Iterated, this produces a second kind of holistic calculus of error reduction, yields improvements in understanding how that system is arranged, its bias systems, how it normally works and its change process flows, as seen by folding in, layering up and ever reintegrating the onion.

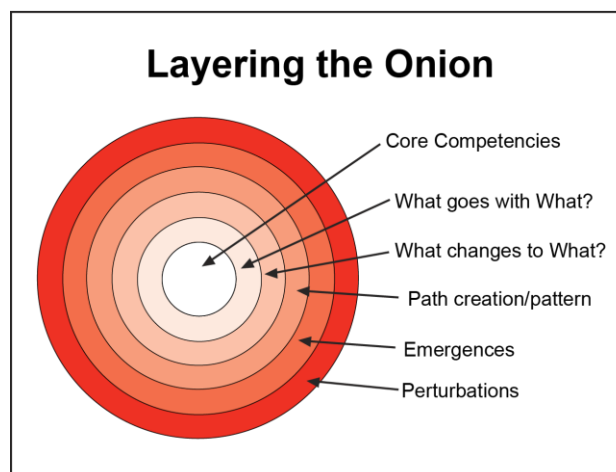


FIGURE 2

One investigative purpose is to recognize this particular “play’s” theme (idea) and its change path. At issue is one of the intelligence community’s biggest challenges, making sense of masses of information, conflicting analogies and metaphors, to understand how this particular LSLIRE will emerge, or how each individual societal system will change in this context. Kurzweil, the expert technology change forecaster, describes his multidisciplinary and experiential education as “many paths to the truth,” thereby building a belief that “there is an idea that can enable us to prevail. Furthermore, we can find that idea.”¹¹⁴ The purpose of finding the animating “idea” is to see the goals, means, potentials and likely solution patterns or paths in a particular, not general, case, which many serial stock experts and philosophers vocalized as being necessary to achieving any understanding of particular organized systems. This linkage between understanding what motivates, animates in each particular case and the plausible shape of an individual outcome is discussed in more detail around the notion, “An idea is to be the ground of the possibility of the natural product.”¹¹⁵ Another example: Adam Smith’s prevailing guide to judging animating societal change involved seeing men’s “sympathies,” which can be self-interest but, systemically in society, is not.¹¹⁶ The topic was discussed earlier, from the negative side, as a limitation of the generalizing aspect of statistical and model use in understanding particular emergences and futures, including LSLIRE’s, and as a positive discussion about experiential knowledge of the board.

A second benefit is that the more deeply, broadly and consistently over time one folds in patterns to layer the onion, the more obvious becomes any individual pattern that does not fit. They may not fit because they are wrong, your understanding is wrong or they may be a precursor of coming system change.

Learning Point: Avoid predetermining. Study what comes.

Approach 4: Consider a Preference for Qualitative Insights to See Change Lacunae¹¹⁷

In general, Goldstone begins and ends with a more quantitative, metric view of incipient precrisis pattern change recognition. Werther suggests that a qualitative, more than quantitative, *perception* best illuminates a pre-event period. He argues that as stable and well-patterned systems begin to change in important ways (as their syndrome changes), it is easier to recognize this prechange period qualitatively.

In Taleb’s turkey farm example, qualitatively new farm activities *must appear* precrisis even as most farm routines, feeding and watering the turkeys, etc., carry on. If modeling normal change (routines), you will see the routines almost unchanged. Only letting in, and then integrating, qualitatively new information, and knowing the “idea” of the turkey farm, forewarns and provides a hint about crisis timing.

As one historic example of this qualitative and idea shift, in years just prior to the outbreak of the Civil War, Tocqueville noted a higher willingness of Americans to escalate to the use of weapons against each other in domestic disputes so that “the cases of people taking justice into their hands are becoming more and more common”; of rising financial crisis, “rascality” and “monetary frauds” coupled with a weakened American justice system that “often fails to offer a sufficient guarantee to the individual such as to encourage him not to take up the task of defending himself”; and of a socio-psychological tendency such “that the Americans continue to keep themselves at a distance. ... They will end up by being drawn into battle against their will.”¹¹⁸

Approach 5: Focus on Seeing Undergirding Socio-Psychological and Style Changes

Personalities and styles—philosophies, values, traditions, customs, and individual or societal ways of doing things—are far more stable than are the typically transient external and/or internal forces. Anyone trying to shake a bad habit or form a good one understands the difficulty. When foundational psychologies, rules and ways change, systems change. “Men,” says 18th century French philosopher Montesquieu, “who are fundamentally reasonable place even their prejudices under rules.”¹¹⁹

People and societies usually respond to momentary, typical, and even longer-term change pressures via their normal biases and ways. When, why and how such normally stable qualitative psychological patterns begin to change is more illuminating, precrisis, than are metrics or variables changing. Best on the Street serial selectees Weintraub (eight recognitions) and Baugh (six recognitions) each spoke of mainstream perceptions being outdated, of mindsets changed and of changing psychologies to make correct market judgments. Vaclav Havel, in *Disturbing the Peace*, speaks intimately of shifting mass psychology in Czechoslovakia and Poland precrisis, and attributes this as a cause of the collapse of those systems and, ultimately, of the USSR. Before the American Revolution came a “revolving” of American psychologies and self-perceptions. Before a vendor immolated himself in Tunisia launching the Arab Spring came socio-psychological change.

Approach 6: Use an Understanding of How Things and Processes are Embedded

With adequate skill one can surf anywhere on a wave, but only on one’s particular wave. Kurzweil speaks of “enabling technologies and market forces” amid particular “social institutions” and “timing,” and he also uses the surfing visual to explain particular emergences in technology change.¹²⁰ Others, like Confucius and Kant, referred to string or threads as necessary to judgment.¹²¹

Learning Point: Learn the embedded architectures and ways of systems or topics of interest, and how that limits or favors options and possibilities.

Approach 7: Learn to Understand How Things and Processes are Entangled

Entanglement refers to a case where two different things, having once been one, carry prior characteristics forward in themselves, such that, though now separate, they still behave relatively similarly. A classic example is former British Commonwealth colonies that became countries, compared to non-British Commonwealth countries. It is not an accident that the United States, Canada, Australia, New Zealand and Great Britain are still similar.

Cultures, societies, families, individuals, firms, organizations and so forth are entangled systems: They always carry their legacy forward. They are not random, unconstrained or free, but are shape-shifting (morphing) specifics going into their future. Their behavior can be foreseen to a very considerable degree based on knowledge of their entanglement features and its implications. Naturally, entanglement degrades over time and differs among contexts. Nevertheless, entangled systems are hard to change, leading to the utility of the skepticism about change that is seen in leading analysts. Kant goes so far as to assert that nature, during change, makes “no leaps.”¹²² This perspective is exactly opposite Taleb’s black swan-as-jump worldview.

Learning Point: Learn the entanglement features of the systems. From what did they derive, and how does this shape them going forward?

The previous section moved readers toward better LSLIRE recognition by discussing prefatory holistic issues. The next section talks about doing better LSLIRE recognition of events most people think are black swans.

SECTION FOUR – The Better Recognition and Timing of an Emerging LSLIRE

LEARNING OBJECTIVES:

- Learn some techniques for better recognizing LSLIRE emergence.
- Learn some ways to personally gain comparative advantage from the fact that most analysts will fail to recognize an emerging LSLIRE.
- Learn why pattern-based intelligence assessment is easier than information-based intelligence assessment, especially in more complex systems.
- Learn the value of intellectual conservatism, especially as applied to proposed change agendas.

At the ‘tail’ of existing model and mainstream analyst’s capabilities, this final section discusses aspects of some new technology potentials, plus innovative ways to improve near-crisis assessment with older, more familiar technology and models where, as they are now used, “the obvious implication is model failure.”¹²³

Both technology conversations lie within the context of two approaches that do not need new, or the innovative uses of old, methods or technologies to better reduce what most people perceive to be a black swan to a more manageable LSLIRE status.

Approach 1 is incapable of understanding that which it helps recognize and time near an event emergence. Approach 2 is incapable of timing a holistically foreseen event’s emergence, but yields better path emergence and context understanding.

The two nontechnology approaches presume adequate familiarity of systems, in the senses previously discussed, and, like everything discussed, all of the approaches are to be used in a holistic, folding-in and never-done layering-of-the-onion way.

As an iterative learning tool, this final section revisits one of Taleb’s proclaimed black swans, 9/11, in more detail and uses a recent “market crash” (the 2007 and still ongoing financial, economic, political crisis), which many people see as a black swan,¹²⁴ but which others, including Taleb, correctly forecast. This difference of perception—black swan or LSLIRE—is exactly the point of learning better pre-event recognition.

IMPROVING RECOGNITION WITH EXISTING TECHNOLOGY THROUGH INNOVATION

Innovative analysis using old technology, as a partial crisis-recognition solution, requires a mindset shift. Yet effectiveness, at an LSLIRE (black swan) emergence, cannot be solely about the model’s outputs becoming noticeably untrustworthy values.

Some models will go crazy, like Goldman Sachs’ models showing “25 standard deviation moves, several days in a row”¹²⁵ prior to the 2007 crisis event. Others, if they are not measuring things relevant to what is

changing, are differentially, and surely relatively, unaffected by the emerging crisis. “The models ... have to be incredibly intricate and particular.”¹²⁶ This places a limit on the model use innovation described next.

Looking at the 2007 LSLIRE (black swan), Marsh and Pflleiderer argue that “the frequency of ‘black swan’ surprises in financial returns is reduced when conditional forecasts of risk are updated in a timely manner ... [and by looking at] variations over time in the intensity of ‘bursts’ of economic events and trading that affects asset price changes.”¹²⁷ With their focus on judging “*shifts* in investment risk,”¹²⁸ Marsh and Pflleiderer use of the Chicago Board Options Exchange VIX Index, as a proxy predictor of U.S. S&P Index moves, Retrospectively, they judged that VIX seems “to be attuned to rare economic disasters and ‘price in’ their risk.”¹²⁹

Notice, when reading their article, the now-familiar language recommending more frequent iteration of existing method’s output to yield a pattern, which allows optics on “variation over time in the intensity of ‘bursts’ of economic events,” “shifts,” and their linked belief that “there are in fact extant models that account much better for the extreme events in security returns observed over time than the black swan discussion might have one believe.”¹³⁰ Also note that “previously inconceivable events can become conceivable with better statistics and better research.”¹³¹

Assuming that the VIX index is a proxy in all weathers, the conclusion that updated iterations of its measures is an optics improvement is logical. It seems plausible too that better data and statistics from new technologies will further reduce black swan surprise. Both are more reasonable when “both technique and judgment play a role.”¹³²

OF NEW TECHNOLOGIES: LSLIRE INSIGHT FROM BIG, BIGGER AND BIGGEST DATA

The European Commission’s recent funding of the Living Earth Simulator—big data on technology steroids—is an example of a technology-driven effort at futures prediction and black swan reduction by attempting to model global, down to local, systems, of which project *supporter* David Lazer says, “Science is like the drunk looking for his keys under the lamppost because the light is better there.”¹³³

Modern scientific encyclopaedism started with the French Renaissance attempt to collect all knowledge, assess it using scientific methods, and then use this knowledge to improve and better manage the world. It has been failing ever since. One problem is philosophical: Do you need to know all the atoms in the stream, and all their potential interactions, to predict which way the stream is flowing, or how to change its flow? Of the “2.5 quintillion bytes of information that, IBM estimates, we generate every day,”¹³⁴ who can master them through total information approaches? The other problem is practical.

It is certain that if you measure more things with technology, more correlations will emerge. Making sense of them is another task entirely.¹³⁵

Two sense-making paths are offered by proponents of gathering and using encyclopedic data approaches to reduce surprises.

One potential solution path is project centralization and expert analysis: “Computers ... are especially bad seeing the big picture ... [because] they are too literal, unable to recognize the pattern once it’s subjected to even the slightest degree of manipulation.”¹³⁶ Who manipulates social, political, economic and other data for their self-interest, how and when? Besides LIBOR cooking and so forth, one can consider the

weatherman's inside joke that "weathermen merely forecast rain to keep everyone else off the golf course."¹³⁷ Unless one considers intention—philosophy, cognitive system, bias, etc.—used in building data, models and expert's analysis, and implications, one is missing the big picture already. Nietzsche's point that "the decisive value of an action may lie precisely in what is unintentional in it. ... The intention is only a sign and a symptom, something which still needs interpretation, and furthermore a sign which carries too many meanings and, thus, *by itself alone* means almost nothing" (emphasis added).¹³⁸

The other is not centralization: "The world is so chaotic that our best chance to make sense of it—to catch the next financial meltdown in time—is to get as many nerds poking at it as possible." Crowd sourcing or "linked-data approaches"¹³⁹ unfold new problems.

What if the world is not chaotic, but contains many entangled systems?

Perhaps, more to the point, we are solving the wrong problem with more "eyeballs that could in theory pay attention to any particular data set, thus increasing the likelihood that someone will stumble across an interesting signal."¹⁴⁰ Someone already almost always does and is almost always ignored and/or punished. More eyeballs on the problem is often not the problem. There is a still bigger problem: ignoring early warnings. Status quo opinions are hard to change. As after virtually every historic large-scale, large-impact rare event (or black swan, if you wish) that struck most people unawares, the facts about 9/11 and the contemporary 2007 (and ongoing) global LSLIRE say that regulators and their bosses mostly ignored early warnings, some quite explicit, from analysts and experts who foresaw the crisis.¹⁴¹ This tendency limits the systemic value of increasing individual recognition of emergence. We address both points later.

The above said, MIT's top-ranked Alex Pentland provides nuanced views that move at least the potential for better LSLIRE recognition and assessment forward. First, "The data is so big that any question you ask about it will usually have a statistically significant answer. This means, strangely, that the scientific method as we normally use it no longer works."¹⁴² Unfortunately for this big data insight, the scientific method as we normally use it never did work well for even normal whole system change recognition, and especially not for rare event foresight, for the simple reason that just because something formerly couldn't be measured didn't make it irrelevant. Recall Kant's, Jung's, Berlin's, Einstein's and Goethe's "beyond analysis" critique and advice: Intuition—experience and familiarity—links knowledge to understanding.

Big data is, however, very important because, being based on individual actions rather than general statistics, it promises, a la Jung, *individualized* insights into future behavior. One problem that nevertheless remains is intuiting future behavior when lacking, as Schopenhauer warned, individual and systems' *idea* understandings. Pentland says, "I saw an estimate recently that said 70 to 80 percent of the results that are found in the machine learning literature, which is a key Big Data scientific field, are probably wrong because the researchers didn't understand they were overfitting the data. They didn't have that dialogue between intuition and causal processes that generated the data. ... That's pretty bad because if you start building our world on results like that, we're going to end up with trains that crash into walls and other bad things."¹⁴³ Or missing LSLIRE (black swan) events that some people foresaw correctly. Silver writes, "In November 2007, economists in the Survey of Professional Forecasters—examining 45,000 economic-data series—foresaw less than a 1-in-500 chance of an economic meltdown as severe as the one that would begin a month later."¹⁴⁴

Within Pentland's context, "the challenge is to figure out how to analyze these connections in this deluge of data and come to new ways of building systems based on understanding these connections."¹⁴⁵ This insight

arrives once again at needing a “knowledge of the boards” kind of understanding, as Kahneman used the term.

Pentland knows about the intuition, understanding and judgment requirements that need to be applied in big data outputs, as advantageous as deeper and broader measurements of more and more may be, and that this required human task is one the machines cannot do. We arrive in the end, even with the development of better methods and more innovative use of old ones, at advantages in a human analyst’s improvement.

COMPARING THE LOGICS OF TWO BETTER RECOGNITION AND ASSESSMENT APPROACHES

The first approach relies on the fact that most mainstream analysts, like their models and methods, are steeped in normality and will fail to recognize crisis.

It was earlier shown how Goldstone and Werther focused on how using specifically arrayed multiples of models and methods that each behave and fail differently just prior to a normal-range crisis (Goldstone) or a system’s harmonic perturbation (Werther), explicitly because of their different built in perspective errors and the differing cognitive loadings. Each provided a different, hence differently wrong, view into reality and change.

The would-be successful analyst’s focus at LSLIRE emergence must shift to measuring the differential failure of mainstream analyst’s judgments.

As was already shown, each method and model will be in error. Recall too from the earlier discussion, while simultaneously folding in the insight of an Office of the Director of National Intelligence presentation that rated their analyst’s synthetic thinking ability is 1.5 on a 5.0 scale,¹⁴⁶ that we cannot count on many analysts being correct precrisis, or on discovering which one will be correct. We can count on most analysts *not* synthesizing emerging change well. They are not trying to be wrong; they just will be.

Essentially, looking at mainstream analysts’ cognitive dissonance near crisis emergences shows the herd mindset breakdown. At a crisis boundary, increased *divergence* in their ability to see the play, or of thinking they did, and decreased self-perceived understanding of it, is brought on by 1) increasing opacity of information (to them) near an LSLIRE boundary, 2) greater model measurement meaninglessness, and 3) concomitant individual variations in each analyst’s ability to recognize that *something* is going wrong. They are unlikely to understand what is wrong when using their mainstream methods, but more begin to recognize that something is wrong.

The second approach is more internal, intuitive and intimate to the analyst, using what Kahneman and many others call building expert knowledge of the board, Berlin calls “beyond analysis” familiarity and understanding of pattern qualities “such as the pattern of each culture or human enterprise,”¹⁴⁷ and what Kant calls building judgment, which links the empirical, indeed all knowledge, to the understanding.

Says Berlin,

What makes men foolish or wise, understanding or blind, ... is the perception of those unique flavors of each situation as it is, in its specific differences—of that in it wherein it differs from

all other situations, that is, those aspects of it which makes it insusceptible to scientific treatment, because it is that element in it which no generalization, because it is a generalization, can cover.¹⁴⁸

It is no accident that serial best experts preferred qualitative, context-specific explanation while generally using models and statistics to beat everyone else at judging. Before closing the discussion with particulars about how to recognize an LSLIRE better, a few more previous insights need to be recalled with their implications.

Because a correct judgment of a coming LSLIRE is by definition outside of the mainstream, hence is normally sidelined, or worse, Pinker says, “Behavioral science is not for sissies.”¹⁴⁹

Additionally, experience shows that while most analysts are wrong and far too often regulators and societies ignore clear warning,¹⁵⁰ individuals who do foresee the old water flowing into new banks are, or can be, comparatively advantaged.

How does one gain the advantage?

LSLIRE Recognition Approach 1

The work of Park and Xie on structured bonds before and during financial crisis emergence circa 2007 provides a window into how to better recognize an LSLIRE boundary that does not depend on human, institutional or model improvement. It relies on analyst’s herd-like normal behavior and diverging error under stress.

Park and Xie used insurance companies, which are a “homogenous group in terms of financial reporting” and use mainstream financial analysis methods.¹⁵¹ The study design purpose is to reduce within group variance as a means to focusing on behavioral shifts around an emerging crisis, the 2007 financial event. The conclusion of their study on structured bond-rating behavior noticed that “the market makers and analysts had informational problems during the unstable economic period” (2005-08), but not before.¹⁵² They noticed that “the market [meaning analysts] did not view structured bonds as opaque assets before 2005.”¹⁵³ As a result, analyst ratings diverged significantly (their normal herd-like behavior declined) after 2005, as they could all no longer see the same play. Said otherwise, as analysts with homogenous reporting requirements increasingly could not see the information clearly (due to opaqueness after 2005), they began to judge information in different ways, so their herd-like ratings *agreement* began to fracture measurably at a statistically significant level.

This is an empirical, but analyst-focused, analog to the Gladstone and Werther notion that arrays of (or in-folded) groups of different models and methods, qualitative and quantitative, fail differently prior to a normal-range crisis event (Werther, system shift) because of their different built-in errors and cognitions. There is an advantage.

The critical difference between normal range crisis recognition and rare event recognition, is that at LSLIRE (black swan) emergence, one cannot use models sensibly, or to triangulate, because some spew nonsense (what does one make of 25 standard deviations over several days?), others vary unaccountably from their prior individual norms (given a near certainty of secretive crisis-induced numbers cooking by unknown self-interested internal actors), and/or are clueless about any change at their probability tail. There is going to be a lot of initial confusion about the meaning of individual models outputs at their respective

statistical tails, not about the fact that analysts will be confused and break herd-like consensus early in the process of LSLIRE change.

The parallel idea that mainstream analysts as a group will fail differently due to their rising cognitive dissonance facilitated by early-in-the-crisis rising information opacity, conforms to the empirical evidence leading up from 2005 toward the 2007 event.

While rising analyst dissonance also comports with observations that multiples of mainstream models act oddly just precrisis—Marsh and Pfeiderer note the 2007-08 crisis boundary in their example¹⁵⁴—an analyst focus within homogenous organizations appears as an even earlier warning tool. Many single experts, with *their* examples, such as housing, warned very early too but were, like single datum, ignored. It is harder for wise people interested in gaining comparative advantage to ignore analyst herd breakup.

As with the folding-in, integration and iterative synthetic rethinking of holistic assessment in normal-time futures forecasting, the more industry mainstream analyst dissonances and model disturbances one notices, the more consideration of emerging system path deviation—LSLIRE—ought to accumulate.

Using *knowable* certainty of error creatively, we have an LSLIRE timing tool. More to the point, with recognition, even if nobody knows *what* is coming, a black swan is reduced to a theoretically, practically knowable and now researchable LSLIRE status.

Like economists who predicted 10 of the last two recessions, one could even be totally wrong in that no LSLIRE (black swan) at all emerges, in which case you will still have been aware of the rising potential. Part of survival is situational awareness, which includes, at a sane, reasonable level, foreseeing what might happen even if it does not.

Learning Point: Mainstream analysts' failure dynamics teach you how to time the emergence of an LSLIRE.

Seeing emergence and entanglement internally needs other tools.

LSLIRE Recognition and Assessment Approach 2

The above methods tell you nothing useful for increasing understanding. They help a perceptive, pattern-synthesizing analyst recognize that *something* very unusual is happening and help in timing its emergence in empirically and statistically measurable kinds of ways, but if understanding remains lacking, Milner's headline—"Trying to Spot Black Swans Offers No Protection From Risk"—is correct.

A companion approach that can lead to the understanding of what is happening, why it is happening and how it is happening must deal with the perception of internals, particularly changing internals, and is the realm of tracing ideas and their implications within changing contexts.

In speaking of the Arab Spring, Israeli Consul General Daniel Kutner began, "Our methods worked until they didn't."¹⁵⁵ The lesson was that up to the point of the rare and definitely large-scale, large-impact event's emergence boundary, Israeli analysts, or for that matter, government leaders in the places about to fall into crisis, read the situation as containable, as it previously had been, based on their assessment methods' outputs. Was there increased Israeli and Middle East analysts' and political risk model dissonance

prior to the Arab Spring? Would a focus on rising analyst dissonance, informational problems, and herd breakup have provided early warning? It is an interesting question.

SOME TRICKS OF THE TRADE FOR HOLISTIC ASSESSMENT, PROFILING OF SYSTEM'S CHANGE PROCESSES AND ITS HARMONIES (EMERGENCE/ENTANGLEMENT) IN LSLIRES

Many classic thinking traditions focus on how *idea and intention*, whether individual, organizational or societal, are advantaged and constrained by contextually specific fit and fitness within their changing environment. The summary point, from quite conservative thinkers, is given by F. A. Hayek's observation that the first person ascending a mountain may go by whatever route seems best, but each subsequent person encounters an established path that advantages ascent, and with increasing usage becomes a way. This path, for good or ill, becomes the tradition and norm for that society, is customarily and often legally constrained, and thus changes only with difficulty, and incrementally.

Learning Point: Ideas, goals and the constrained ways of normally achieving them are as important to understanding as facts and figures.

A societal construction is only partially logical in an objective reasoning sense, but the behavior of it, and within it, is contextually reasonable and habitual. A descriptor for this logic is legacy moving forward; another is embeddedness becoming emergence. A Bostonian version of the concept is that its tangle of roads was designed by cows. Once designed, that is subsequently where the people went. Every society, organization and person has its accreted cow paths, and then travels on them, reshaping them over time.

Learning Point: You, and your enemy, can know what your system will do.

Seen from an informational perspective, more complex systems are *harder* to understand than simpler ones because there is more information within the former to be *known*. Seen from a patternist and holistic change process perspective, more complex systems are *easier* to change profile and understand because they have more interlocking parts and processes, hence more recursive features. That makes them harder to change. Because more complex systems' legacies are harder to change, and are more incremental whenever they do shift, including in an LSLIRE aftermath, *patterns* are *easier* to predict at system-response level.

As a visual, think about normal pattern predictability, and about changing the direction, once seen, of an ocean liner versus kayak. Which is more predictable once you know the path it is on? What is more unpredictable in terms of internal processes, the ocean liner (for example, the U.S. Army or GE) or the kayaker (Joe's hot dog stand)? The bigger and more complex a system is, the more predictable internally and externally once a pattern is set. This is why Tocqueville spoke of old water flowing within new banks after the French revolution (he saw France's essential cow paths before and after revolutionary change). It takes a long time to change a society, or a large organization, which is why effecting even desired reform is so difficult.

Learning Point: “Big picture” patterned response reliability is counterintuitive to information-based predictive notions in complex adaptive systems.

An intelligence system based on making sense of information gets more confused as systems get relatively more complex. Intelligence based upon learning a system’s ways, patterns, change processes, legacies and embedded-to-emergent and entangled-to-emergent change dynamics gets less confused as systems get relatively more complex. This is why serial stock market experts are patternists; it is easier. Taleb’s Extremistan is a more common feature of change in simpler systems. This is how and why Taleb misjudges Extremistan’s importance as a relevant condition of complex, well-embedded, human-involved, societal systems. They tend, even post-crisis, to travel on cow paths.

Learning Point: Information-based intelligence is often different and more confusing than pattern-based, change profiling-based holistic intelligence.

Knowing the interaction of ideas, goals, capacities, ways and their resilience profiles, yields system-specific insight about how and why certain outcomes are more likely than others, and permits seeing, via pattern shifts, how a system is changing but not when.¹⁵⁶ In judging, each patterned subsystem of a system can be treated as a system, and their normal interactions and change processes can be change profiled (but not intricately modeled) and then seen whole as a normalized syndrome.

Recognizing an arising LSLIRE-scale syndrome shift involves knowing a system’s normal subsystem harmonies and disharmonies and then noticing the *quality* of the pattern shift.¹⁵⁷ The subsystem change can presage the syndrome shift.

As a visual, a known healthy person normally behaves as one syndrome (as *this* healthy person), but with just one subsystem beginning to shift (an oncoming illness, say), the behavior of the whole system will shift and we can foresee, through learning and experience, a new future syndrome of it even though *this* system (person) has no prior experience of it. A syndrome shift’s recognition can be obvious before the exact cause is known, but once it is known, the emerging syndrome shift can also be change profiled several iterations out based on pattern recognition, analogy and experience/intuition.

As a matter of such syndrome futures, it matters whether the diagnosis is one of cancer, liver failure, heart disease or any other disease, but all instances have understandable subsequent change-profile paths broadly knowable through contextually shaped analogy.

Learning Point: Prefer intellectual conservatism as a default pathway position; adjust as more is contextually learned.

A river, or society, can be entered anywhere and still its direction of flow becomes obvious. Well before the 2007 financial crisis, many analysts voiced concerns about the future of the United States that were centered on the limitations of having large debt. Bin Laden saw the same thing, and as we will see, specifically targeted that.

Learning Point: Gain any entry.

The best cognitive grounding for LSLIRE recognition and for seeing downstream implications is social psychology, comparative philosophy and history, not economics.

Learning Point: Learn humanity in its reasons, ways and forms.

Profiling systems and their changes is a complicated subject, but an absolutely necessary LSLIRE ability. In every technical method discussed, the qualities of intuition based on prior learning and experience, insight, iterative integration to see patterns, judgment and whole-system synthesis are known to be necessary to transition from information to knowledge to understanding, and to foresee emerging embedded and entangled factors in specific contexts of syndrome change. The closing example is given because Taleb said, recall, that had 9/11 been *conceivable*, it would not have happened. But it did happen, many conceived some elements, but none more completely, so far as is known, than former soldier, then security expert, Rick Rescorla. He foresaw both the earlier truck attack on the World Trade Center and the later 9/11 aircraft attack, trained his client to evacuate and died helping it happen. The closing example means no insensitivity to anyone, but hopes to show some emergent patterns that made Rescorla's achievement conceivable. Here was no "empty suit."

HOLISTICALLY PARSING 9/11

Osama bin Laden expressed concern, on Aug. 3, 1995, that his country's leader had "drowned the country in a sea of debt,"¹⁵⁸ and repeated many times into the late 1990s and early 2000s that economic weakness leads to decay and instability.¹⁵⁹

He said on Aug. 23, 1996, that terror and ambush are valid techniques,¹⁶⁰ and said on Feb. 23, 1998, that a tactic against the enemy is to "plunder their money."¹⁶¹ On May 28, 1998, he drew a parallel between fighting the United States to Russia's experience in Afghanistan as leading to its economic and political collapse, lauded terror as sometimes commendable, mentioned the World Trade Center as a target, said that the jihadists of the 1993 truck bomb attack on the WTC "went on to fight then in the USA itself."¹⁶²

On Oct. 21, 2001, bin Laden again drew a USA-USSR bankruptcy and collapse parallel; on Dec. 26, 2001, he again mentioned the economy as a primary target; and on Feb. 16, 2003, he said that the United States rested on a "frail foundation." On Oct. 29, 2004, he admitted that the idea for the WTC attack came in response to events in the Middle East, and that, based on experience against the former USSR, "We are continuing in the same policy—to make America bleed profusely to the point of bankruptcy."¹⁶³ Thus, he argued for hitting the U.S. economy "by all possible means," because the "economy can easily collapse. The very flaws of the ... fiscal system are becoming its noose." He also said that once stuck long-term in foreign entanglements such as Afghanistan and Iraq, the United States will focus domestically because, "If their economy is destroyed, they will be occupied with their own affairs. ... In summary, America is a great country which possessed tremendous military might and a wide ranging economy, but all this is based on a frail foundation, and it is possible to target this frail foundation ... to make America bleed profusely to the point of bankruptcy."¹⁶⁴

Inconceivable? Black Swan? Apparently 9/11 was not inconceivable to bin Laden, nor to Rescorla, a true master of his craft.

CLOSING COMMENTS

The philosophical and cognitive position here is that humans are not so much, as black swan-guided thinking says, dependent upon luck while living in a universe beyond their ability to understand or to forecast. It says that technology and modeling are invaluable complements to building the best theory and practice of LSLIRE recognition and assessment, and to the management of downstream implications. It says that machines are a valued complement to a more than adequate complex human nature, rather than a replacement for it. And it says that learning, experience, intuition and judgment matters.

Imperfect though knowledge and understanding may be, every reasonably competent person negotiates life daily and forecasts reasonably well in their familiar environment. Why should better black swan to large-scale, large-impact, rare-event recognition and forecasting be any different?

GLOSSARY OF TERMS¹⁶⁵

2007 Crisis: Commonly referred to as the 2008 crisis, but since this essay speaks of emergence and since the crisis was clearly evident in 2007 (earlier to the prescient) with near-event trigger indicators, the earlier date is used to denote its emergence.

Analysis: “Separation of the whole into its component parts; an examination of a complex, its elements, and their relations; the identification or separation of ingredients in a substance; a statement of the constituents of a mixture; a method of philosophy of resolving complex expressions into simpler ones.”
Note: It is easy to see that analysis is the opposite of integration and synthesis.

Atomism: “A doctrine that the universe is composed of simple indivisible minute particles.” Note: In the sense used herein, this is counter to views that focus on the interdependencies and interconnectedness of things and processes.

Big Data: Generally, data sets or streams so large and complex that they are difficult, or impossible, to adequately handle using existing technologies. Note: Big data can be seen as a solution set under the rubric *total information systems*, a form of Encyclopaedism.

Black Swan (alternative definitions): A black swan, as Taleb defines it in his prologue (xvii-xviii), is 1) an outlier event, which 2) carries extreme impact and 3) “makes us concoct explanations for its occurrence after the fact.” Elsewhere, Taleb says it is unpredictable, which is why people concoct explanations later. Other people use the term in many and various ways, to enfold events missed by most people because they are rare, missed by computer models and/or experts, and to include events they simply seem personally to have misunderstood. For example, see Investopedia’s entries, “Definition of ‘Black Swan’: An event or occurrence that deviates beyond what is normally expected of a situation and that would be extremely difficult to predict,” and “Investopedia explains ‘Black Swan’: Black swan events are typically random and unexpected. For example, the previously successful hedge fund Long Term Capital Management (LTCM) was driven into the ground as a result of the ripple effect caused by the Russian government’s debt default. The Russian government’s default represents a black swan event because none of LTCM’s computer models could have predicted this event and its subsequent effects.”

See <http://www.investopedia.com/terms/b/blackswan.asp#ixzz1sDPxi1aO>.

It is the clarification of these definition points and their respective practice implications, and the reduction of Taleb’s own black swan examples to a foreseeable (foreseen) event status, that is a theme of this essay. To see things as unforeseeable, hence subject only to retrospective prediction, is to overstate the matter (another theme) that wrongly shapes professional practice (another essay theme).

Cognitive (cognition): “To come to know; the act or process of knowing including both awareness and judgment.” Note: Differentiated herein from understanding, in the sense Kant, Berlin and others use that term. Second, cognitive systems—systems of knowing—are tied to methodological systems of awareness, and in this essay are tied to the idea that each method contains biases, hence gives cognitively biased awareness and judgment, hence similarly *delimited* knowledge. Each science is thus a system of bias. For example, a chemistry-based method yields chemistry-type answers and a physics method yields physics-type answers. Integrative, synthetic or holistic methods thus use and layer multiple cognitive stances.

Confessional: Referring to a social science approach, stemming from the 19th century problem of state building, and state maintenance, which looked at modern state systems through a religious affiliation lens. It was particularly focused on the known instabilities of political systems with differing religious communities within the same boundaries: Catholic-Protestant in Ireland, Hindu-Moslem-Sikh-etc. in India, Catholic-Muslim-Orthodox in Yugoslavia, Muslim-Christian-Jewish in the Middle East, sectarian divisions of all these religions and so forth.

Consociational (consociate; consociationalism): “Association in fellowship or alliance.” Note: As used herein, consociationalism refers to formal power-sharing arrangements among disparate, usually hostile, religious, ethnic, linguistic and national groups placed within one state boundary. For example, Switzerland (German, French, Italian, Romansh), Belgium (Flemish, Walloon), and many similar systems such as mid 20th century Lebanon, are consociational: associations in alliance. These normally, if they work at all, have formal constitutional and administrative power-sharing arrangements based on the prominent fracture lines within that society. Of course, if one group has more children than another (relative population grows), power must shift, or else.

Dissonance: “A mingling of discordant sounds; a lack of agreement; discord.” Note: A musical metaphor useful in describing a growing separation of analyst agreement (herd behavior), hence a statistically measurable tool for gaining insight into rising confusion.

Embedded: “To enclose closely in a matrix; to make something an integral part of; to surround closely.” Note: As used herein, the opposite of an atomist view, holding that things and processes are shaped by their contexts. They are, in some sense, un-free, constrained by their surroundings, integral to wholes. One can say, for example, that individuals are embedded in their particular societal and other systems.

Emergence (emerge; emergent): “To rise from or as if from an enveloping fluid; to become manifest; to come into being through evolution.” Note: Tied to the concept of embeddedness, and again, the opposite of the atomist view. Being enclosed and integral to a specific enfolding context, things emerge into *their* future in constrained, shaped (but not determined), hence relatively foreseeable, ways.

Encyclopaedism (encyclopedia; encyclopedic): “A work that contains information on all branches of knowledge.” Note: Tied to Enlightenment efforts, mostly in France by scientific rationalist and deists, to assemble all knowledge in one place, then use experts to effectively and efficiently manage society. It had a heavily arithmetic flavor. An early form of “total information systems” thinking that is eerily reminiscent of some current “big data” rationalist, technologist and scientific management claims of it being a superior way to manage society. Failed then from lack of understanding of complex systems, and from various, including administrative management, problems.

Entangled (entanglement): “The condition of being deeply involved; ensnared.” Note: As used herein, the concept of entanglement borrows from the physics notion that two things, having once been one, will behave similarly though now separate. In one version, the Einstein-quantum mechanics debate over “spooky action at a distance” defines the entanglement concept. It is used more gently in this essay to describe the legacy-moving-forward aspect, hence similar emergence characteristics (futures), of once-one societal systems, such that while now separate, they retain similar (embedded, emergent) behaviors to environmental stressors, internal procedures, mindsets, etc., and yield foreseeable future choices under, naturally, their now differing contexts. Over time, logically, entangled systems degrade, morph and separate to become more independent syndromes of their former oneness.

Extremistan: Taleb's term for the world of the extreme, where black swan effects lie. Also used as a mindset construction for people's perception of the world.

Fit (fitness): "Adapted to an end or design; appropriate; suitable; to be in harmony or accord." Note: Tied to the economic and business usages of that term—and opposed to the atomist notion—of being embedded in, emergent with and entangled with, one's context, prior choices and situations. The idea is that a fitted individual, firm or organization is a contextually constrained one, hence a reasonably predictable one.

Hellenic (Hellenism): "Relating to Greek history or thought after Alexander the Great." Note: Post unification, in other words. Tied to cognitive and mindset shifts after the decline of the ancient, independent Greek societies, which Nietzsche (*The Birth of Tragedy from the Spirit of Music*) and others have discussed.

Holistic (holism): "Emphasizing the organic or functional relation between parts and wholes—rather than atomistic." Note: Determinist mindsets, referring rather to the syndrome characteristics of complex adaptive systems, are explicitly rejected in this essay. This essay deals only in foreseeing human-involved, not nature-type (hurricanes, earthquakes, etc.), systems.

Integrate: "To form into a whole; unite." Note: This is not synonymous with synthesis as a way of knowing, but is the reverse of analysis (to take apart and examine parts).

Intuition (technical usage of): "immediate apprehension"; "a direct perception of truth, fact, etc, independent of any reasoning process"; "the quality or ability of having such direct perception or quick insight." Webster's Encyclopedic Unabridged Dictionary of the English Language: New Deluxe Edition. 2001. San Diego, CA: Thunder Bay Press. 1002.

LIBOR: London Inter-Bank Offered Rate. Used to set benchmark interest rates globally. The numbers were "creatively" constructed, one could say, by banks from around 2007.

Mediocristan: The universe of conventional affairs and thinking where, according to Taleb, most people intellectually live.

Model: "A miniature representation of something; a description or analogy used to help visualize something ... that cannot be directly observed; a system of postulates, data and inferences, presented as a mathematical description of an entity or state of affairs." Note: The point is made that arithmetic models, being composed of postulates, representations, analogies, inferences and so forth made by biased people who create them, are no more or less scientific or accurate than nonarithmetic ways of knowing. The goal is best practice use of all-biased tools within particular grounds of knowing and understanding.

Patternism (patternist): The idea that focusing on patterns of information is how complex systems are to be best understood. The essay quotes Ray Kurzweil on this point, which has been made from ancient times to the present. It is easy to see how this fits into embedded, emergent, entangled, integrative, synthetic and syncretic thought.

Phalange (Phalanx): Refers to generally Spanish or Lebanese fascist organizations.

Recursive thinking: Technically, thinking that takes itself into consideration. More generally, circular thinking, as in having a feedback loop, from a basis of understood fact or logic, in that it continually revisits itself to test, retest and retest again appropriateness. This concept is used to layer the onion, to attain ever-deeper integration and synthesis in a changing situation, and to continually test appropriateness as new knowledge is added.

Syncretism (syncretic): “The fusion of two or more originally different inflectional forms; the combination of different forms of belief or practice.” Note: The emphasis is on forms becoming fused. This kind of thinking is used in religious studies to explain the fusion of forms of belief to shape a new form of belief. Think synthesis, but of forms.

Syndrome: “Combination; a group of signs and symptoms that occur together and characterize a particular abnormality [or particular normality].” Note: Used by Adam Przeworski and Henry Teune to describe the stable to shifting state of a complex adaptive system, in the sense that the system does not change entirely, but rather morphs from one syndrome (adaptation, fit) to another, with mostly the same component things still internal, though their meanings, usages and behaviors may change.

Synthesize (synthesis): “The composition or combination of parts or elements so as to form a whole; the combining of often diverse conceptions into a coherent whole; the complex so formed.” Note: As used here, synthetic activity is the cognitive-philosophical, knowledge and understanding-based formation of a new ideational whole. This is more than just mechanically putting things together—to integrate—where deep understanding may, or may not, have advanced to see the systemic whole.

Total information systems: Refers to modern, technologically enabled, attempts to gather up all information. Note the upgraded version of Encyclopaedism as a task.

¹ Buddhist, Hindu and other holistic traditions, for example, place fundamental emphasis on mind and particular consequence in actions and their results.

² See Steven Pinker, *The Blank Slate: The Modern Denial of Human Nature* (New York: Penguin Books, 2003), 1-102.

³ Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970).

⁴ Carl Jung, *The Undiscovered Self*, trans. R. F. C. Hull (New York: A Mentor Book, New American Library, Penguin Books, 1958).

⁵ Frans Valk, “Really Out There: Lessons from the Nonfinancial Industry on the Evaluation and Treatment of Extreme Events,” (panel discussion, Casualty Actuarial Society’s 2012 Enterprise Risk Management Symposium, Washington, D.C., April 20, 2012).

⁶ Kevin Madigan, “A Healthy Skepticism Toward Model,” *Actuarial Review* 39, no. 1 (February 2012): <http://www.casact.org/newsletter/index.cfm?fa=viewart&id=6301>.

⁷ *Ibid.*

⁸ Guntram Werther, “Holistic Integrative Analysis of international Change: A Commentary on Teaching Emergent Futures,” (a joint publication of the Office of the Director of National Intelligence, the U.S. Army War College Center for Strategic Leadership and the National Intelligence University) *The Proteus Monograph Series* 1, no. 3 (January 2008).

⁹ *Ibid.*, 65-71.

¹⁰ Adam Przeworski and Henry Teune, *The Logic of Comparative Social Inquiry* (Malabar, Florida: Robert E. Krieger Publishing Co., 1982), 10-13, 29.

¹¹ Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology* (London: Penguin Books, 2006), 5-6.

¹² Werther, “Holistic Integrative Analysis”; Guntram Werther, “Profiling ‘Change Processes’ as a Strategic Analysis Tool,” *Competitive Intelligence Magazine* 3, no. 1 (January-March 2000): 19-22.

¹³ Aristotle, *The Ethics of Aristotle: The Nicomachean Ethics*, trans. J. A. K. Thomson (New York: Penguin Books, 1983): 65.

¹⁴ Howard Gardner, *Five Minds for the Future* (Boston: Harvard Business School Press, 2006).

- ¹⁵ Werther, "Holistic Integrative Analysis," 1.
- ¹⁶ Guntram Werther, "Beyond the Blocking Tree: Improving Performance in Future-Oriented Analysis," *Competitive Intelligence Magazine* 3, no. 4 (October-December 2000): 41.
- ¹⁷ Brian Hershberg, "What Makes a Great Stock Analyst? After Two Decades of our Best on the Street Survey, Some Qualities Stand Out," *The Wall Street Journal: The Journal Report* (May 10, 2012): C7-C16.
- ¹⁸ Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Straus and Giroux, 2011).
- ¹⁹ *Ibid.*, 11.
- ²⁰ Moses Maimonides, *The Guide for the Perplexed*, trans. M. Friedländer (New York: Dover Publications, 1956).
- ²¹ Confucius, *The Analects*, trans. Raymond Dawson (Oxford: Oxford University Press, 1993), 60; Immanuel Kant, *Critique of Judgment*, trans. J. H. Bernard (Mineola, New York: Dover, 2005), 16. One version of Kant's guiding thread argument is, "This harmony of nature with our cognitive faculty is presupposed *a priori* by the Judgment, on behalf of its reflections upon nature in accordance with its empirical laws; whilst the Understanding at the same time cognises it objectively as contingent, and it is only the Judgment that ascribes it to nature as a transcendental purposiveness (in relation to the cognitive faculty of the subject). For without this presupposition, we should have no order of nature in accordance with empirical laws, and consequently no guiding thread for an experience ordered by these in all their variety, or for an investigation of them."
- ²² Hershberg, "What Makes a Great Stock Analyst?"
- ²³ Jung, *The Undiscovered Self*, 19.
- ²⁴ Sir Isaiah Berlin, *The Sense of Reality: Studies in Ideas and Their History*, ed. Henry Hardy (New York: Farrar, Straus, and Giroux, 1997), 46.
- ²⁵ Walter Isaacson, *Einstein: His Life and Universe* (New York: Simon and Schuster, 2007).
- ²⁶ Kant, *Critique of Judgment*, 38.
- ²⁷ Werther, "Beyond the Blocking Tree," 41.
- ²⁸ Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2007), xvii-xviii.
- ²⁹ *Financial Times Lexicon*, s.v. "black swan," <http://lexicon.ft.com/Term?term=black-swan>.
- ³⁰ Taleb, *The Black Swan*, xviii.
- ³¹ Hedge Fund Marketing Alliance, "Black Swan Hedge Funds Grow in Popularity," (September 19, 2011), <http://www.hedgefundmarketing.org/black-swan-hedge-funds-grow-in-popularity/>.
- ³² Black Swan Advisors. http://blackswansa.com/index.php/base/qualified_purchaser. Downloaded on April 16, 2012.
- ³³ Wikipedia, s.v. "The Black Swan (Taleb book): Sales," [http://en.wikipedia.org/wiki/The_Black_Swan_\(Taleb_book\)#Sales](http://en.wikipedia.org/wiki/The_Black_Swan_(Taleb_book)#Sales).
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- ³⁵ Kahneman, *Thinking Fast and Slow*, 14, 75.
- ³⁶ David Aldous, book review of *The Black Swan: The Impact of the Highly Improbable*, by Nassim Nicholas Taleb. (January 2009), <http://www.stat.berkeley.edu/~aldous/157/Books/taleb.html>.
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- ³⁸ Brian Milner, "Trying to Spot Black Swans Offers No Protection From Risk." *The Globe and Mail* (June 3, 2012), <http://license.icopyright.net/user/viewFreeUse.act?fuid=MTY0NDI0OTM%3D>.
- ³⁹ Nicholas Taleb. "Stabilization Won't Save Us" *The New York Times*, December 24, 2012, A19.
- ⁴⁰ Aldous, *The Black Swan* book review.
- ⁴¹ Bernard Knox, *Backing Into The Future: The Classical Tradition and Its Renewal* (New York: W.W. Norton, 1994), 19-20).
- ⁴² David Lindberg, *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 B.C. to A.D. 1450* (Chicago: University of Chicago Press, 1992), 23-24.
- ⁴³ Taleb grounds his thinking in the atomism of "überphilosopher Bertrand Russell."
- ⁴⁴ Knox, *Backing Into The Future*, 19-20.
- ⁴⁵ Taleb, *The Black Swan*, xxi.
- ⁴⁶ *Ibid.*
- ⁴⁷ Hershberg, "What Makes a Great Stock Analyst?" C7.
- ⁴⁸ Taleb, *The Black Swan*, xxiv.
- ⁴⁹ Nilsson and Westerström, "Black Swans," 4-7; Taleb, *The Black Swan*, xviii-xxi, xxiv, xxxvii, 18, 35, 61.
- ⁵⁰ Milner, "Trying to Spot Black Swans," 2.
- ⁵¹ Taleb, *The Black Swan*, 44-50.
- ⁵² *Ibid.*, xxi.
- ⁵³ *Ibid.*, 17.
- ⁵⁴ Milner, "Trying to Spot Black Swans," 2.
- ⁵⁵ *Ibid.*
- ⁵⁶ Taleb, *The Black Swan*, xxi.
- ⁵⁷ *Ibid.*, 44.
- ⁵⁸ Alexis de Tocqueville, *Tocqueville on America After 1840: Letters and Other Writings*, ed. and trans. Aurelian Craiutu and Jeremy Jennings (Cambridge: Cambridge University Press, 2009), 337.
- ⁵⁹ Alexis de Tocqueville, *The Ancient Regime and The Revolution*, trans. Gerald Bevan (London and New York: Penguin Books, 2008), 34.
- ⁶⁰ *Ibid.*, 9-10.
- ⁶¹ Taleb, *The Black Swan*, 3-21.
- ⁶² *Ibid.*, xix.

⁶³ The Department of Homeland Security now honors Rick Rescorla for his post-event resilience, but not so publicly for his prescience about the two coming attacks on the World Trade Center, both of which the intelligence community apparently missed. See *Wikipedia*, s.v. "Rick Rescorla"; See *The Rick Rescorla National Award for Resilience*, <http://www.dhs.gov/files/programs/rick-rescorla-national-award-for-resilience.shtm>.

⁶⁴ Aldous, *The Black Swan* book review.

⁶⁵ Ibid.

⁶⁶ Nilsson and Westerström, "Black Swans," 4.

⁶⁷ See, as a partial example: Book review of *The Black Swan*, *Forex Blog*, February 7, 2011, <http://www.earnforex.com/blog/2011/02/book-review-the-black-swan-nassim-nicholas-taleb/>; Andrew Gelman, "Nassim Taleb's *The Black Swan*," (blog), April 9, 2007, http://andrewgelman.com/2007/04/nassim_talebs_t/; Giles Foden, "Stuck in Mediocrity: Nassim Nicholas Taleb's *The Black Swan* leaves Giles Foden Feeling Underwhelmed by its Theories of Improbability," *The Guardian*. (May 11, 2007), <http://www.guardian.co.uk/books/2007/may/12/society>; Tyler Cowen, "Nobody Expects the Spanish Inquisition—Or Do They?: A Look at Nassim Taleb's *The Black Swan*," *Slate* (June 13, 2007), http://www.slate.com/articles/arts/books/2007/06/nobody_expects_the_spanish_inquisition_or_do_they.html; Dana Aspach, book review of *The Black Swan*, "The Black Swan is a Must Read Book," *About.com*, <http://moneyover55.about.com/od/bookreviews/a/theblackswanbookreview.htm>; Gregg Easterbrook, "Possibly Maybe," *New York Times*, April 22, 2007, <http://www.nytimes.com/2007/04/22/books/review/Easterbrook.t.html?pagewanted=all>; Eric Falkenstein, "Review of Taleb's *The Black Swan*," March 13, 2009, <http://falkenblog.blogspot.com/2009/03/review-of-talebs-black-swan.html>; Will Davies, "All in a Flap: Beware Unknown Unknowns," *The Oxonian Review of Books* 6, no. 3 (summer 2007), <http://www.oxonianreview.org/issues/6-3/6-3davies.htm>; Greg Linster, book review of *The Black Swan*, *Coffee Theory* (blog), October 27, 2010, <http://coffeetheory.com/2010/10/27/book-review-the-black-swan/>; Larry Prusak, "The Black Swan," *HBR Blog Network*, *Harvard Business Review*, June 14, 2007, http://blogs.hbr.org/prusak/2007/06/the_black_swan_1.html; Jack Uldrich, "Foolish Book Review: *The Black Swan*," *Fool.com*, August 10, 2007, <http://www.fool.com/investing/general/2007/08/10/foolish-book-review-the-black-swan.aspx>.

⁶⁸ Peter Westfall and Joseph M. Hilbe, "The Black Swan: Praise and Criticism," *The American Statistician* 61, no. 3 (August 2007): 193-94; Robert Lund, "Revenge of the White Swan," *The American Statistician* 61, no. 3 (August 2007): 189-92; Aaron Brown, "Strong Language on Black Swans," *The American Statistician* 61, no. 3 (August 2007): 195-97.

⁶⁹ Taleb, Nassim Nicholas, "The Black Swan: Quotes & Warnings that the Imbeciles Chose to Ignore," <http://fooledbyrandomness.com/imbeciles.htm>.

⁷⁰ Taleb, *The Black Swan*, 40.

⁷¹ *Stanford Encyclopedia of Philosophy*, s.v. "Russell's Logical Atomism," <http://plato.stanford.edu/entries/logical-atomism/>; Bertrand Russell, *The Principles of Mathematics* (New York and London: W. W. Norton Co., 1964); Bertrand Russell, *Introduction to Mathematical Philosophy* (New York: Simon and Schuster, 1971).

⁷² Kant, *Critique of Judgment*, 24-27.

⁷³ Arthur Schopenhauer. 1969., *The World as Will and Representation* (Vol. 1), trans. E. F. J. Payne (New York: Dover Publications), 141.

⁷⁴ *Quotes4all.et*, s.v. "Johann Wolfgang von Goethe," <http://quotes4all.net/johann%20wolfgang%20von%20goethe.html>.

⁷⁵ Within the philosophical and religious thinking traditions about complexity and change, any of the major Eastern religions and philosophies yield a more contextually nuanced and holistic interpretation of change than does atomism. In the Western traditions, one might nominate pre- and Germanic Romantic thinking traditions that, from Schopenhauer on forward, doubted the explanatory power of the more arithmetic tendencies of the British-American science efforts, or even the conservative and anti-Enlightenment traditions that took a more holistic, skeptical of human agency. Einstein, perhaps surprisingly to many, had deep philosophical learning, and is variously quoted as doubtful about mathematics as explanation of the real world. See <http://www.spaceandmotion.com/mathematical-physics/famous-mathematics-quotes.htm>.

⁷⁶ Taleb, *The Black Swan*, 40.

⁷⁷ Note: See http://en.wikipedia.org/wiki/Jeff_Cooper; Originally developed by the U.S. Marine Corps, later adapted by John Dean "Jeff" Cooper to code mindset in peril conditions, the color code system, in its various versions is: Living in green (or white) involves being unaware, unprepared and exhibiting naive trust. Living in red is too exhausting; nobody can be in crisis (active peril response) mode all the time. Living in yellow is doable in the long term and is a contextually sophisticated "watch your blind spot" mindset. Living in orange is when a specific peril is identified.

⁷⁸ Taleb, *The Black Swan*, 44.

⁷⁹ Ibid., 4, 7.

⁸⁰ The purpose is showing that even a brief, time-budgeted reading from superficial sources would cast into doubt that Lebanon was a "paradise." Advanced reading destroys that claim utterly.

⁸¹ My sources are the BBC, various online encyclopedias, and prior readings into the theory and practice of consociational and confessional systems. Detailed histories of Lebanon will, of course, provide more information.

⁸² Geoffrey Wheatcroft, "A World in Denial of What it Knows," *The New York Times*, December 31, 2011.

⁸³ Christopher Catherwood, *Churchill's Folly: How Winston Churchill Created Modern Iraq* (New York: Carroll & Graf Publishers, 2004); David Fromkin, *A Peace to End All Peace: The Fall of the Ottoman Empire and the Creation of the Middle East* (New York: Avon Books, 1989).

⁸⁴ The author warned in a Fortune 100/500 corporate lecture far prior to 2007, and also in an Office of the Director of National Intelligence-funded futures-forecasting project submitted in 2007-early 2008, that globalization was about to have a bad time. Contact Proteus Futures Group Executive Director Col. William Wimbish III and Proteus Futures Group Program Manager Col. John Auger for bona fides.

⁸⁵ Ibid.

⁸⁶ Ibid.

- ⁸⁷ Jon Hilsenrath and Tom Lauricella, "Stock Rally Snags on Gloom: China Cuts Rates, but Investors Worry About Limits of Central-Bank Actions," *Wall Street Journal* (Friday, June 8, 2012): A1.
- ⁸⁸ *Ibid.*
- ⁸⁹ *Ibid.*, A6.
- ⁹⁰ Madigan, "A Healthy Skepticism," 3.
- ⁹¹ Allan Murray, "Man or Machine? Ray Kurzweil on How Long it Will be Before Computers Can Do Everything the Brain Can Do," *The Wall Street Journal* (June 29, 2012): C12. See also Kurzweil, *The Singularity is Near*.
- ⁹² Jenny Strasburg and Jacob Bunge, "Loss Swamps Trading Firm: Knight Capital Searches for Partner as Tab for Computer Glitch Hits \$440 Million," *Wall Street Journal* (August 3, 2012): 1; Nathaniel Popper, "Trading Surge Shakes Markets as Stocks Zigzag: Rogue Algorithm Cited—Incident Adds to Doubts About Superfast Computer Trades," *New York Times* (August 2, 2012): B7.
- ⁹³ Hershberg, "What Makes a Great Stock Analyst?"
- ⁹⁴ Bob Tita, "Best on the Street: General Industries—Mark Weintraub," *Wall Street Journal: The Journal Report* (May 10, 2012).
- ⁹⁵ Hershberg, "What Makes a Great Stock Analyst?"
- ⁹⁶ *Ibid.*
- ⁹⁷ Leslie Scism, "Best on the Street: Insurance: Life—Bob Glasspiegel," *Wall Street Journal: The Journal Report* (May 10, 2012).
- ⁹⁸ Dawn Wotapka, "Best on the Street: Home Construction & Furnishings—John A. Baugh," *Wall Street Journal: The Journal Report* (May 10, 2012).
- ⁹⁹ Russell Adams, "Best on the Street: Advertising and Publishing—William Bird," *Wall Street Journal: The Journal Report* (May 10, 2012).
- ¹⁰⁰ Brian Hershberg, "Best on the Street: Electronic & Electric Equipment—Jed Dorsheimer," *Wall Street Journal: The Journal Report* (May 10, 2012).
- ¹⁰¹ Dan Fitzpatrick, "Where are They Now? Mike Mayo: A Banking Gadfly Stays in The Game," *The Wall Street Journal* (May 10, 2012).
- ¹⁰² Aristotle, *The Ethics of Aristotle*, 65-66, 76-77.
- ¹⁰³ Hershberg, "What Makes a Great Stock Analyst?" C7.
- ¹⁰⁴ Kahneman, *Thinking Fast and Slow*, 11.
- ¹⁰⁵ Brooke Masters, Caroline Binham and Kara Scannell, "Barclays Fined a Record £290M," *Financial Times* (June 27, 2012), <http://www.ft.com/cms/s/0/2a4479f8-c030-11e1-9867-00144feabdc0.html>; Max Colchester and Jean Eaglesham, "Libor Process Under Review," *The Wall Street Journal* (June 29, 2012): C1.
- ¹⁰⁶ Isaacson, *Einstein*, 81, 113.
- ¹⁰⁷ Kahneman, *Thinking Fast and Slow*.
- ¹⁰⁸ Berlin, *The Sense of Reality*, 21-25, 33-37, 50-51, 57-65.
- ¹⁰⁹ *Ibid.*, 45-46.
- ¹¹⁰ Werther, "Holistic Integrative Analysis," 1.
- ¹¹¹ Jack A. Goldstone, "Using Quantitative and Qualitative Models to Forecast Instability," United States Institute of Peace, Special Report 204 (March 2008).
- ¹¹² Werther, "Holistic Integrative Analysis."
- ¹¹³ Goldstone, "Using Quantitative and Qualitative," 15.
- ¹¹⁴ Kurzweil, *The Singularity is Near*, 1-3.
- ¹¹⁵ Kant, *Critique of Judgment*, 163-166.
- ¹¹⁶ Werther, "Holistic Integrative Analysis," 23-24.
- ¹¹⁷ Lacunae, often an anatomical term, is here used to refer to blank spaces, missing parts or discontinuities in data or understandings about a system.
- ¹¹⁸ Tocqueville, *Tocqueville on America*, 257, 261, 283, 286, 337.
- ¹¹⁹ Werther, "Holistic Integrative Analysis," 16.
- ¹²⁰ Kurzweil, *The Singularity is Near*, 3-5.
- ¹²¹ Kant, *Critique of Judgment*, 16, 174, 176.
- ¹²² *Ibid.*, 14.
- ¹²³ Terry Marsh and Paul Pfeiderer, "Financial Modeling and the Crisis I: 'Black Swans,'" (May 26, 2011): 1.
- ¹²⁴ Gregory Skidmore, "Current Financial Crisis is a Black Swan," Seeking Alpha, October 6, 2008, <http://seekingalpha.com/article/98669-current-financial-crisis-is-a-black-swan>; Astrid Illgner, Juhani Platt, and Brandon Taylor, "Black Swans, Crisis Economics, and Globalization: A Critical Appraisal," *New Voices in Public Policy* V (winter 2010/2011); Laurence Siegal, "Black Swan or Black Turkey?: The State of Economic Knowledge and the Crash of 2007-2009," *Financial Analysts Journal* (July/August 2010), <http://www.scribd.com/doc/33471547/Black-Turkeys-not-Black-Swans>; Milner, "Trying to Spot Black Swans"; *HubPages*, "What is a Black Swan Event?" last updated November 1, 2010, <http://era9000.hubpages.com/hub/What-is-a-Black-Swan-Event>.
- ¹²⁵ Marsh and Pfeiderer, "Financial Modeling," 1. Full quote: "As Goldman Sachs' chief Financial Officer famously lamented in August 2007: 'We were seeing things that were 25 standard deviation moves, several days in a row.'"
- ¹²⁶ David Weinberger, "The Machine That Would Predict the Future," *Scientific American* (December 2011), 55.
- ¹²⁷ Marsh and Pfeiderer, "Financial Modeling," 9.
- ¹²⁸ *Ibid.*, 1.
- ¹²⁹ *Ibid.*
- ¹³⁰ *Ibid.*, 3.
- ¹³¹ *Ibid.*, 9.
- ¹³² *Ibid.*, 2.

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- ¹³⁴ Nate Silver, "The Weatherman Is Not a Moron." *The New York Times* (September 7, 2012), 1, <http://www.nytimes.com/2012/09/09/magazine/the-weatherman-is-not-a-moron.html>.
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- ¹³⁶ *Ibid.*, 6.
- ¹³⁷ *Ibid.*, 2.
- ¹³⁸ Friedrich Nietzsche, *Jenseits von Gut und Böse* (Stuttgart, Germany: Alfred Kröner Verlag, 1953), Part II, Section 32, 44.
- ¹³⁹ Weinberger, "The Machine," 57.
- ¹⁴⁰ *Ibid.*
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- ¹⁴² Alex Pentland, "Reinventing Society in the Wake of Big Data," Edge.com, August 30, 2012, <http://www.edge.org/conversation/reinventing-society-in-the-wake-of-big-data>.
- ¹⁴³ *Ibid.*
- ¹⁴⁴ Silver, "The Weatherman," 2.
- ¹⁴⁵ Pentland, "Reinventing Society."
- ¹⁴⁶ Recall also the cognitive work on synthesis thinking in Gardner's *Five Minds for the Future*.
- ¹⁴⁷ Berlin, *The Sense of Reality*. See pages 15-23 and 32-52 for a fine comparison between formal scientific knowing and "beyond analysis" kinds of knowing.
- ¹⁴⁸ *Ibid.*, 24.
- ¹⁴⁹ Pinker, *The Blank Slate*, 121. See also the classic Kuhn, *The Structure of Scientific Revolutions*. There are many other works on authority and punishment of dissent in human affairs. Indeed, the philosophy of knowing, and the history of ideas has that insight as one of its main themes over the centuries.
- ¹⁵⁰ For the ongoing global financial and economic crises, see, as examples, *Report to Fannie Mae Regarding Shareholder Complaints by Mr. Nye Lavalle*, OCJ Case No. 5595, May 19, 2006; judgments from 2005 onward by professor Nouriel Roubini that U.S. home process were riding a speculative wave; warnings to U.S. and other regulators from at least 2008 that LIBOR was being manipulated.
- ¹⁵¹ Sojung Park and Xiaoging Xie, "The Opaqueness of Structured Bonds: Evidence from the U.S. Insurance Industry" (delivered at the Fox School of Business, March 25, 2011), 7.
- ¹⁵² *Ibid.*, 27.
- ¹⁵³ *Ibid.*, 25.
- ¹⁵⁴ Marsh and Pfeleiderer, "Financial Modeling," 4-9.
- ¹⁵⁵ Daniel Kutner, ("The Middle East in Transition: Stability, Peace and Economis," lecture presented at the, Fox School of Business, Temple University, Philadelphia, April 1, 2011).
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- ¹⁵⁷ Przeworski and Teune, *The Logic*, 12-13, 29.
- ¹⁵⁸ Brad Berner, *Jihad: Bin Laden in his Own Words—Declarations, Interviews, and Speeches* (BookSurge LLC, 2006), 18-27, especially pages 23 and 25.
- ¹⁵⁹ *Ibid.*, 40, 42, 48, 49, 56, 57, 80, 105, 118-119, 169, 171, 176, 201.
- ¹⁶⁰ *Ibid.*, 55, 64, 66.
- ¹⁶¹ *Ibid.*, 80.
- ¹⁶² *Ibid.*, 81, 82, 86, 92, 96.
- ¹⁶³ *Ibid.*, 105, 115, 118-119, 169, 171, 176, 201, 306-10.
- ¹⁶⁴ *Ibid.*, 23, 118-119, 169, 171, 215, 225, 339.
- ¹⁶⁵ Source, unless otherwise noted, is the *Merriam Webster 7th New Collegiate Dictionary*, (Springfield, Mass.: G. & C. Merriam Co, 1972). Exact definitions are in quotation marks. Names of famous people are not included in the glossary on the assumption that readers can easily find, for example, Sir Isaiah Berlin or Carl Jung.