Thinking about Thinking and Practices – What it Means to Reach Effective Risk Management Decisions in Banking

### *Abstract*

*It is a commonly held misbelief in risk management in banking that logics and mathematics in economics and finance serve as panacea for all the challenges risk managers face. Against the background of lurking traps on this terrain of risk management, the call for an avoidance strategy cannot be ignored. We outline five guidelines that should be met on the way towards decision-making competency in risk management: 1) Adopt intellectual modesty to come to the insight that every approach to risk management can be maladaptive. 2) Effective risk management is ascribed to well-informed decision-making where the risks are known and understood by decision-makers. 3) Understanding risks does not culminate in risk control, but creates room for more systems-oriented regulation. 4) Reaching awareness of a latent paradox: Effective risk management and mitigation can be ineffective when viewed dynamically. 5) Practical wisdom is trump for determining decision-making competency: Formal modeling is no substitute for human judgment in evaluating risks.*

### *Keywords*

Risk management; decision-making; systems movement; practical wisdom; banking

### Introduction

There is an art of which every human being should be a master, the art of reflection.[[1]](#footnote-1) Very pertinent is the question which the English poet Samuel Taylor Coleridge puts, – “If you are not a thinking man, to what purpose are you a man at all?” (Coleridge, 2015). Daniel Kahneman differentiates between “Thinking, Fast and Slow”. Yet, both instinctive and emotional thinking (what he calls fast thinking) and more deliberative, more logical or analytical thinking (what he calls slow thinking) can be superficial and quick, as well as premature and insufficient. In our time where analytical *and quick* thinking is often praised, rewarded and overrated, it might really go astray or might only be indispensable because people have begun too late to think about an issue. Thus, *deep thinking* – and, as special cases, creative or disruptive (Schumpeter) and holistic or systems thinking –, which takes time, ought to be honored. From time to time, we must step out of the stream of direct experience and our immediate responses to it. Otherwise, there is the veritable risk that one might just end up being quick on the avoidable road to doom and disaster.[[2]](#footnote-2)

By profound thinking or reflection, we are able to unmask the illusion in risk management in banking that logics and mathematics in economics and finance serve as panacea for all the challenges risk managers face. A model example of such a logician’s trap would be to use a standard risk model such as Value-at-Risk (cf. Riedel, 2013: 21; Litzenberger & Modest, 2010: 75; Jorion, 1997) for past data from an imperfect world, constituting an elusive and random sequence of events rather than a set of independent or normally distributed etc. observations, which is what many standard, i.e., probabilistic risk models demand, because many economic and financial variables and quantities look like they would possess such idealized properties. But, “resemblance to truth is not the same as truth” (Bernstein, 1996: 335). In other words, some risk analysts or ‘quants’ neglect if the assumptions, they need to establish once a certain formal modeling approach is selected and applied, are *really* satisfied in their respective real-world context (e.g., Brose et al., 2014: 369; Mikes, 2009; MacKenzie, 2006). Despite the lip service that has often been paid to more *critical* (Mikes, 2011: 240; Taleb et al., 2009; Power, 2007: 122) and *holistic* (Nario et al., 2016: 24; McNish et al., 2013; Pergler & Lamarre, 2009) risk management, especially in the aftermath of the global financial crisis, problems still abound and many more other examples of technical risk assessment’s shortcomings exist (cf. also Stulz, 2009; Hellwig, 2008: 52; Duffie, 2007; Daníelsson et al., 2001).

Thus, while it is true that limitations of formal risk modeling are not unheard of, but well-known in the literature of banking and finance, the call for an avoidance and mitigation strategy cannot longer be ignored in light of both lurking traps on the terrain of risk management as well as missing impact of previous lessons learned in economic practice. In response to that, we raise the following guiding question: How can technical or mathematical risk assessment be embedded into and controlled by judgmental practices of risk assessment to realize better and more effective risk management decisions?

The remainder of this article is structured as follows: The subsequent section 2 briefly reviews the relevant literature and, thereby, underlines the finding that a sufficient answer has not yet been provided to our research question. In section 3, we propose an avoidance and mitigation strategy regarding the traps for (mainly) technical risk assessment approaches by presenting six guidelines that inform decision-making competency in risk management, which in turn will be summarized in a proposition in the final section 4.

### Reviewing the relevant literature

In general terms and as the discussion in Stulz (2008) suggests, there are five types of risk management failures out of which the first three concern technical risk assessments:

1. *Failure to use suitable risk metrics*
2. *Mismeasurement of known risks*
3. *Mismeasurement stemming from overlooked risks*

*3.1) Ignored known risks (wrongly viewed as immaterial)*

*3.2) Unknown or undetected risks*

1. Failure in communicating risks to top management
2. Failure in monitoring and managing risks.

According to the failure to use suitable risk metrics, a risk metric or model does not provide the right information to senior or top management, information tailored to their needs, not because it is calculated incorrectly, but because, for example, it answers the wrong question (which is true for, e.g., Value-at-Risk; Acerbi & Tasche, 2001: 4). Accordingly, this weakness of a risk model would amount to its diminished applicability if, on the one hand, it does not pick up the (strategic) questions which guide risk management in banking. On the other hand, there might be difficulties to *interpret* model results, because it might be difficult to discern the reasoning behind the sophisticated calculations (Boatright, 2011: 8). In this case, the model is perhaps more complicated and (skill-)demanding than necessary[[3]](#footnote-3) or does not achieve highest levels of transparency in the formalizations.[[4]](#footnote-4) For instance, “due to their [structural; C.H.] complexity, analytical models are often viewed as ‘black boxes’ that emit ‘correct’ results. Models are often accepted or relied upon without sufficient understanding or checks and balances.” (Braswell & Mark, 2014: 203).

The second issue, beheld by Stulz (2008) but which we wish to understand in slight difference to him, says that risk managers could make a mistake in assessing the *likelihood* of a large loss, or they could be wrong about the *size* of the loss (the *impact*), *given* that the respective risk can be identified and quantified *ex ante*. Or they could use the wrong distribution altogether or may mismeasure the *cor-relation* across different risks or among the different positions of a bank (ibid.). The vulnerability of the bank or of a portfolio to low-probability events with extreme consequences, resulting not only from an increase of correlations (Stulz, 2008), but also from the mismeasurement, may be critical. Hence, a risk model might be poor at assessing and analyzing certain already identified possible risk events correctly in terms of likelihood and impact although they can basically be identified and quantified in advance.

Finally, third, a bank’s risk managers may either ignore a known risk, whose extent and full implications might remain unclear, “perhaps because of a mistaken assumption that it is immaterial, or because of the difficulty of incorporating it in the existing risk models” (Stulz, 2008: 62f.). Or a significant risk is “truly unknown, or at least completely unanticipated” (ibid.: 63). The corresponding weakness of a risk model would be to neglect the installation of *new* risks and some major sources of uncertainty or to be unable to assess risks meaningfully at present.[[5]](#footnote-5)

These three points by Stulz (2008) can, for now, be taken as a sufficient elaboration of deficiencies of purely or mainly quantitative approaches to risk assessment; but what is the moral of the story on the constructive side? *How should they be complemented qualitatively?* In the face of the global financial crisis that erupted in 2008, a critical finance, management and accounting society emerged that basically asks for a forward-directed practice, offering knowledge and strategic advice tailored to management needs; proving that, even without elaborate calculations, *risks can count* (i.e. matter) (Mikes, 2011: 240; Power, 2007: 122). Their proponents consider risk management to be more art than science, resisting “the urge to push metrics into carefully protected areas of judgment” (Mikes, 2011: 227). Risk figures are viewed as mere trend indicators (*calculative pragmatism*; Power, 2007), which they seek to complement, and often overwrite by practical wisdom (Schwartz & Sharpe, 2010), by senior managerial discretion, experience and judgment (Cassidy, 2010: 3; Bhidé, 2010).

In section 3, we build on and extend this community’s prior work to, on the one hand, render it more accessible to risk managers, i.e. to convert their rather high-level aphorisms into calls for action. On the other hand, a partial revision, i.e. some reservations concerning the praise of judgment as an art are in order (Tetlock, 2009) since, to put it metaphorically, proponents of critical finance seem to jump from the pan of probabilistic reasoning into the fire of measurement refusal. Prior to that, the following table summarizes their insights and beliefs and provides from *this* angle a juxtaposition of quantitative risk modeling and qualitative risk analyses along different criteria.

|  |  |  |
| --- | --- | --- |
|  | *Quantitative risk modeling* | *Qualitative risk analyses* |
| Underlying worldview | Mechanical worldview and ‘analytical’approach | Complexity worldview*?*  At least, more holistic view |
| The function of risk management | Computation tool | ‘Learning machine’ |
| Span of quantitative  risk management (attempts) | Attempt to measure risks in the broad sense, e.g., as negative, rare and *uncertain* events with severe *consequences* | Measure only quantifiable risks (e.g., corresponding to the body of a return or loss distribution) |
| Tools of risk assessment / management | * Value-at-Risk * Expected Shortfall * … | * Scenario planning * Stress testing * … |
| Time perspective | Modeling based and depending on historical data | More forward-looking, risk anticipation |
| Strategic significance of risk management | Derived from the integration of risk management with planning and performance management | Derived from influencing top-level decision-making (providing a ‘strategic view‘ of risks) |
| Calculative culture | *Quantitative enthusiasm*:   * Risk numbers are deemed representative of the underlying economic reality * Emphasis on the ‘robust’ and ‘hard’ nature of modeling * *Calculative idealism*: Replacing judgmental risk assessments with risk quantification * Risk control by measurement | *Quantitative skepticism*:   * Placing a much lesser degree of trust in numbers, * seen as trend indicators only * Focus on “softer” instrumentation and envisioning risks * Emphasis on learning about the underlying risk profile from the trend signals |

### Escaping the Traps for Logicians: Towards Decision-Making Competency in Risk Management

*Follow effective action with quiet reflection.*

*From the quiet reflection will come even more effective action.*

(Peter Ferdinand Drucker, 2005)

In the densely connected and turbulent world of ours, optimization or efficiency, enabled by elegant risk models, may still be desiderata. But, ensuring effectivity or effective risk management decisions, often taken for granted once a ‘good’ model is in place or underappreciated as a minimum accomplishment, would prove to be a respectable primary goal. Informed and effective risk management, in turn, ultimately comes down to making good decisions. “Risk assessment has a decision-guiding purpose” (Taleb, 2013: 7). The output of the risk management process, where evaluating risks is the crucial step, is an array of concrete decisions, such as whether to make or to refuse a loan, whether to add capital to the firm, or how to hedge a position. What can adequate or effective risk management achieve and what will be the criteria?

In the following, we are committed to determine effective risk management in the sense of characterizing decision-making competency in a risk management context of banking, going far beyond the programmatic and biased remarks by the critical finance community. We begin with a negative answer to the foregoing question, i.e., with an aspect that does *not* qualify as a criterion for good risk management decisions.

### Every approach to risk management can be maladaptive

Effective risk management does notprovide a guarantee against failure. The employment of any, even of an entirely effective decision-supportive tool for quantitative or qualitative risk assessment and management can neither eliminate *model risk*, nor as matter of logical necessity entail good risk management decision outcomes. Risks are inevitably cohesive with undeniable uncertainty (be it measurable or not), which implies that taking and managing risks is connected with uncertain decision outcomes. The decisive point for grasping the quality of a risk management decision is then not represented by the still uncertain amount of actual profit or loss induced by that action because, at the point of decision-making, a certain chance of loss could be more than offset by a certain chance of rewards, but still failure could occur at the end. We should therefore not base our judgment on the effectiveness of risk management tools on the *ex ante* unknowable (values), which is, unfortunately, not sufficiently acknowledged in the literature and practice.[[6]](#footnote-6) For example, the mere fact that the risk management function of many banks “played an essential role in the recent financial crisis does not necessarily mean that it was at fault in any way. Some risks are worth taking, and even great risks may be rationally chosen if the [expected] returns are sufficiently high.” (Boatright, 2011: 11).

### Effective risk management is ascribed to well-informed decision-making where the risks are known and understood by decision-makers

Nevertheless, it is evident from recent financial crises that risk managers often do not understand the risk they are taking and, therefore, make decisions that not only turn out badly in terms of outcomes, but are procedurally unwarranted at the time of decision-making. In simpler words, to judge the quality of processes only by outcomes in a stochastic world is nonsense. Instead, risk management should enable *well-informed decision-making*, which is not a trivial matter to describe. The decisive point for grasping the quality of a risk management decision is, thus, represented by the degree of which decision-makers *know and understand* the risks associated with possible outcomes of the firm’s strategy before they make decisions to commit the firm’s capital(Stulz, 2008: 60).

### Understanding risks does not culminate in risk control, but creates room for more systems-oriented regulation

Control presupposes a high degree of knowledge of possible future disturbances in the system and requires a very rapid and prescient intervention, i.e., before the disturbance actually occurs. However, this requirement may hardly be met by banks or organizations, which are incorporated in an extremely dynamic, organized and complex environment. Furthermore, isolating the firm from the outside to ward off disturbances is also only possible to a very limited extent because, otherwise, it loses its integrability into the environment and, therefore, its viability. Thus, the more complex the environment, the less promising is a risk management approach that sees its role in the direct control of the individual system elements. Often this provokes a vicious circle: the less it is feasible for a risk manager to really steer and determine what is happening, the more he intervenes in the system in a commanding and after control striving way, in the vain attempt to finally transfer the situation into a manageable one for all times. What is needed is a change in perspective: A bank is not primarily subject to exogenous control but it regulates and steers itself to a great extent. And not the individual activities of elements, but the structure of systems ought to be put at the center of attention; a transition from control (attempts) to regulation is a *sine qua non* for absorbing and coping with complexity, which is to create an interplay of complexity reduction and complexity increase (Ulrich & Probst, 1990: 63f.). In other words, “most of the complexity absorption takes place within the systems, not be-tween them. These forces of self-organization must be purposefully leveraged.” (Schwaninger, 2009: 16)..

### True decision-making competency involves modesty: insights into the limits and limitations of methods

Intellectual modesty follows from personal reflectiveness, which has, for example, the following facets:

* using numerical *and* symbolic models of risk boldly to estimate values without being overly impressed by mathematics;
* opening the black boxes of risk modeling and global finance in order to fully understand the premises and conclusions of mathematical theorems;
* not expecting more from risk management than it can deliver;
* questioning not only alleged solutions to (the seemingly right) problems, but also whether we deal with the right problems at all.

### A latent paradox: (Apparently) effective risk management and mitigation turn out to be ineffective

Effective risk management is not only incapable of providing a guarantee against failure, but, counter-intuitively, effective quantitative or technical risk assessments might even be a source of new risk as soon as it is perceived as advantageous by (sufficiently many) risk managers or experts.

In general, “stability is destabilizing” (Minsky, 1986/2008), relative tranquility encourages more risk-taking; notably technical risk evaluations constitute legitimization strategies for justifying the creation of ubiquitous risks and lure people into accepting threats to their lives and livelihoods that they would not accept on the basis of their intuitive feelings (Renn, 2008: xiv; Mayo & Hollander, 1991). Tools of risk measurement cater to our tendency to understate uncertainty and complexity in order to offer an illusion of understanding the world. It is an unpleasant but inevitable fact that theoretically beneficial model properties (model level) do not necessarily lead to practical enhancements in larger concrete systems: “Many academics imagine that one beautiful day we will find the ‘right’ model. But there is no right model, because the world changes in response to the ones we use.” (Derman & Wilmott, 2009; cf. for theoretical background also Leonard, 2010; Dacey, 1976).

The conclusion here is twofold:

First, we conjecture that, in the economic practice, *prudence* is a virtue, prudence in acting is a domi-nant strategy and that most successful risk managers excel since, in the face of fallible models combined with possibly harmful dynamics, they manage to keep *exposure* very low. Risk management should be about lessening the impact of what we don’t understand (Taleb et al., 2009: 78). When we recognize that designing and employing risk models has enormous effects on banks, other users, and the economy in toto, many of them beyond our comprehension, we ought to make sure that a given strategy, however good it may look *ex ante*, will not bring about unacceptable losses if events do not unfold according to plan A or B. Likewise, we ought to pay attention to possible warning signs of financial turmoil (e.g., excess leverage, lack of transparency, hubris, funding mismatches, …) and adopt a complexity worldview to not see single ‘deterministic’ causes, but many insignificant inputs or stochastic causal intertwinings (for the latter, cf. Pearl, 2000): e.g., for a financial crisis, that may be amplified and may accumulate over time to reach a tipping point and cause a catastrophic event.

Second, no single model outcome can capture complex risks comprehensively, but we can still have a handle on them so long as we use a variety of decisional tools and risk indicators and so long as we can have an *open mind*.

### Practical Wisdom is trump for determining decision-making competency: Formal modeling is no substitute for human judgment in evaluating risks

While risk models and their technical sophistication might sometimes overwhelm the human capability to comprehend them, they also satisfy our ingrained human desire to simplify by squeezing into one single model output matters that are too rich to be described by it. We like simplicity, but we like to recall that it is our models that are complicated or (in better cases) simple (i.e., not more complicated than necessary) and their result which can (but should not) be simplistic, not the world, which is complex.

What would there be to do if some factors just *cannot* be reasonably considered in a risk model? Where should we draw the demarcation line between a legitimate reduction, a reasonable abstraction and a naïve reductionism, a blind oversimplification? Metaphorically speaking, do mathematical models strip actual events to the bones or cut away vital parts of their anatomy? It appears that such questions have been disregarded too much for too long and, instead, it has been pointed to the practicality of sacrificing reality for elegance. On the other hand, a critical question is also whether it is more arbitrary to quantify imperfectly (but have the qualitative risk factors counted) or not to quantify such items at all (and have them possibly ignored).

Purely technical answers are incomplete and unsatisfying. Reductionisms should not be accepted as they are guilty of imposing untenable a priori metaphysics on the world and on science. In a risk management context, the decision-maker thus needs to know not just the output of a formal risk model, which is only an intermediate result in a risk assessment process, but also an appropriate amount of information surrounding it. Because what is (apparently) not measurable and cannot be expressed in mathematical form could disappear from sight, and a dominant pursuit of accuracy would entail that small parts were taken out of larger contexts in order to capture a simplified picture and single relationships accurately.

On the decision level, risk managers should profit from their experience in the financial arena, not in the sense of involving an obscurantist intuitionism or a mechanical and uncritical application of habits of thought to fields different from those in which they have been formed; but experience that sensitizes them for what should be formally modeled, and how, as well as experience that has taught them to be very humble in applying mathematics to real systems, and to be extremely wary of ambitious theories, which are in the end trying to model human behavior. Rather than simply navigating the rules and incentives established by others, risk managers are encouraged to identify and cultivate their practical wisdom. Our technical risk evaluations eventually face the tribunal of reflectivity and such practical wisdom. In other, context-related words, practical wisdom comes down to

* disclosing the abstraction and reduction (or reductionism?) process of risk modeling in its com-prehensive extent and manifestation;
* risk professionals focusing on qualitative managerial judgments about investment or risk strategies, market conditions etc. which are valuable inputs into risk management processes (at best, integrated in a systematic, consistent fashion with quantitative tools); because not everything that is germane to risk assessment might be captured in formal models and, in particular, risk measurement should succeed a non-formal heuristic reasoning to facilitate a clear, transparent and steered formalization of risks;
* disciplining or challenging, at the same time, intuition because the quality of an intuitive judgment requires an assessment of the regularity in the domain and the predictability of the environment;
* reaching a so-called *reflective equilibrium* (Rawls, 1971; Goodman, 1955)[[7]](#footnote-7), in the most general sense the end-point of a deliberative process in which we reflect on and revise our beliefs about an area of inquiry; the inquiry might be the broad question, “how to manage extreme and systemic risks effectively?” or it might be much more specific;
* bringing holistic and systems thinking in line with holistic and systemic action, which requires us to treat the tackling of open-loop thinking as a permanent and perennial task;
* …

Practical wisdom helps raise awareness of how to interpret the results gained by means of risk models and how to embed them in the larger risk management process.

### Conclusion

Despite the progress made by those more operationalizable guidelines compared to the prior work by the critical finance community, it is still a long way from here to a sustainable solution to both theoretical and practical risk management issues and failures. Much remains to be done, but the path forward to new horizons continues: “No matter how efficient school training may be, it would only produce stagnation, orthodoxy, and rigid pedantry if there were no uncommon men pushing forward beyond the wisdom of their tutors” (von Mises, 1957/2005: 175). For now, the subsequent proposition synthesizes our tentative insights on effective risk management and decision-making competency.

*Proposition: Effective risk management can be characterized in the sense of*

*decision-making competency. In demarcation to ineffective risk management as well as*

*in addition to the previous findings by the critical finance community,*

*decision-making competency and effective risk management*

*have the following features (among others):*

* *realizing that every approach to risk management can be inappropriate*
* *understanding and knowing risks*
* *creating room for more systems-oriented regulation in lieu of risk control*
* *being intellectually modest and perceiving limits and limitations of methods*
* *using effective risk modeling approaches that enlarge the realm of known risks*
* *cultivating prudence as a successful strategy in risk management*
* *fostering practical wisdom*.

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### Conflict of Interest

The authors declare that they have no conflict of interest.

1. Wilhelm von Humboldt jotted down a few aphorisms which, posthumously, his editors put under the heading “About Thinking and Speaking”. The first three aphorisms deal with reflection, “the essence of thinking”, and the second stands out: “In order to reflect, the mind must stand still for a moment in its progressive activity, must grasp as a unit what was just presented, and thus posit it as object against itself” (cited in von Glaserfeld, 1995: 90). [↑](#footnote-ref-1)
2. In the less drastic and sharp words of Zaleznik (2004): Managers “instinctively try to resolve problems quickly – sometimes before they fully understand a problem’s significance”. [↑](#footnote-ref-2)
3. As Einstein is supposed to have said when asked how complex a theory or a model should be: “Everything should be made as simple as possible, but not simpler.” [↑](#footnote-ref-3)
4. However, one should not disregard that results of mathematical finance are based on centuries of development in mathematical logic and that the conditions under which certain (very) precise conclusions hold are an integral and crucial part of any theorem. Therefore, from a more technical, methodological point of view, another reading of the fact that non-suitable risk metrics have been used might be provided: “The Crisis saw numerous examples where ‘practice’ fully misunderstood the conditions under which some mathematical concepts or results could be applied” (Das et al., 2013: 702; cf. also Angius et al., 2011: 2). As a result, another important lesson to be learned is to always understand in detail the premises and conclusions of a mathematical theorem (see section 3.4.). [↑](#footnote-ref-4)
5. Some experts (e.g., Kuritzkes & Schürmann, 2010: 104) would probably like to add a further category of *un-knowable* risks. However, by definition, little can be done to learn about or manage the unknowable. [↑](#footnote-ref-5)
6. For example, Williams (2010: 107) writes naively: “Lehman traders took on risk with each trade every day. At day’s end, these bets showed up on the firm’s profit and loss (P&L) statement as either profit or loss. This provided immediate feedback on whether risk was appropriately managed or not.” [↑](#footnote-ref-6)
7. Even though in substance the reflective equilibrium *idea* is central to Goodman’s work, the *term* was made prominent by Rawls. Cf. <https://plato.stanford.edu/entries/reflective-equilibrium/>. [↑](#footnote-ref-7)