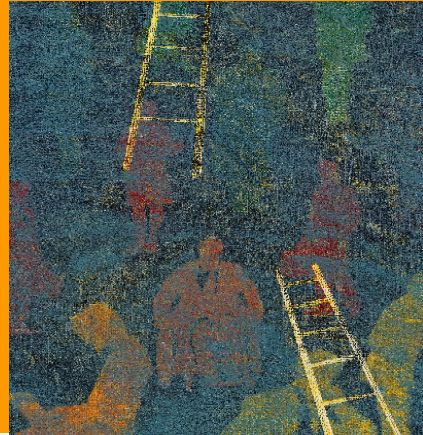


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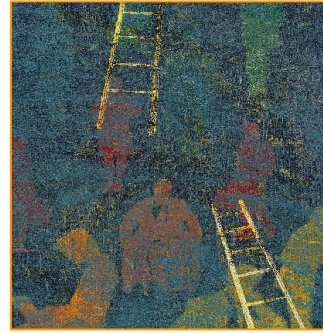


# Upgrading your risk assessment for uncertain times

Number 9 | Martin Pergler  
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# Upgrading your risk assessment for uncertain times

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## Introduction

As shock waves from the financial crisis reverberate and the pain of a global economic downturn makes its way through the economy, many companies are asking increasingly demanding questions about risk assessment. How severely will we be affected by today's situation? How can we anticipate the next round of challenges and be nimble in responding to them? Can we confidently identify and act on opportunities now, and will we be able to do so as the economy eventually recovers? What can we do to avoid being surprised by the next economic cycle?

Some companies are in active crisis-management mode, struggling to ensure the necessary short-term liquidity for survival, or dealing with huge immediate counterparty risks. Many more, while not quite in intensive care, have sustained more than their share of cuts and bruises and may be increasingly uncertain of their abilities to withstand further punishment. No matter what condition a company finds itself in, however, it is becoming very clear that these uncertain economic times are making responsiveness, flexibility, and early insight into emerging risks invaluable skills.

Is your risk assessment capability up to the challenge? Unfortunately, many companies' risk assessment approaches have proved ineffective or even harmful. They failed to consider a broad enough range of potential outcomes and provided a false sense of security. Rather than dwelling on the failures, however, this paper shall consider what can be learned from those approaches that have worked well. McKinsey's experience with companies in a variety of business sectors highlights the following six imperatives for upgrading risk assessment. These imperatives are applicable throughout the economic cycle, but are particularly important during periods of high uncertainty or economic downturn.

1. Consider "risk cascades" rather than individual risks
2. Think through the risks to your whole value chain
3. Understand your likely response and the responses of others
4. Stress-test responses with plausible extreme scenarios
5. Address the implications of risk, not just the risk map
6. Be aware of the limitations of insight.

### 1. Consider "risk cascades," rather than individual risks

The most important and difficult challenge in assessing risk is to understand how first-order, second-order, and third-order effects combine to affect the financial performance of your enterprise. We call this the "risk cascade." First-order effects are those that have a direct impact on the economics of your enterprise. Labor cost escalation, IT system failures, or new product breakthroughs are examples of first-order effects. It is easy to draw the direct link

between a risk and its impact on your company's profits. Second-order effects are those that have an indirect impact on your business. They influence another element in your industry or value chain, and thereby change the economic balance of your industry. For instance, should the factor costs of your competitors change, causing repricing in your industry, your profits will be affected indirectly even if your own costs do not change. Third-order effects are those that affect the entire economy, including your industry and your company. Examples include the effect of macroeconomic shocks on worldwide demand.

This idea of a risk cascade is particularly important during periods of instability. The current financial crisis is an excellent example. The implosion of the subprime mortgage market and the consequent bursting of the housing bubble had a direct impact on players in the real estate market. This was the first-order risk effect. However, the effects of the housing meltdown cascaded into a liquidity crisis in the financial sector, as institutions lost faith in their counterparties' balance sheets. Many otherwise robust financial institutions were driven into distress, and the cost of liquidity increased for everyone. This was the second-order effect. The combined impact of these effects on consumer spending and corporate credit-intensive business models has caused a general economic downturn, the third-order effect.

Risk cascades tend to surprise us most when they appear to behave in nonlinear ways. We are used to calculating the exact effect of a 5-percent change in driver A on driver B. Our assumption is that a 20-percent change in driver A scales as a simple proportion. But a change of \$20 per barrel in the price of oil or 200 b.p. in the spread may set off a cascade, while the \$5 or 50 b.p. change would just dissipate through the system.

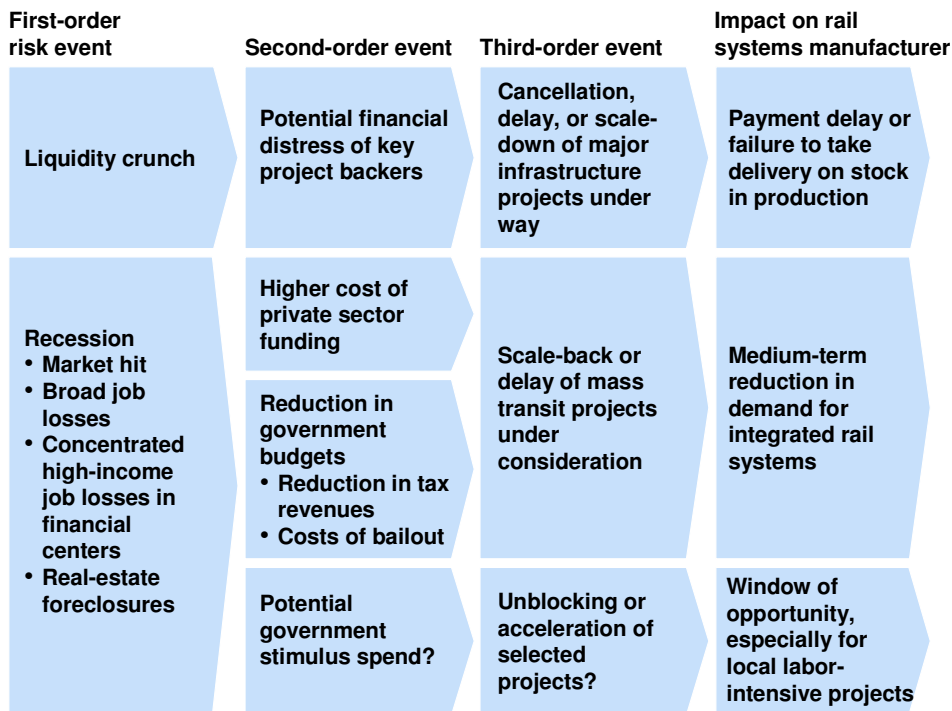
#### What to do

How should companies map risk cascades? Continue to think broadly about the range of risk events that might affect you and your industry. Then systematically identify first-, second-, and third-order effects of each risk event. In so doing, you will link some of the events into cascades, recognizing that they are likely to occur together. You will also identify risks you may have missed – second- or third-order effects in particular, where your first risk map captured only the first-order effect. Only then prioritize and quantify the risks, to ensure that you do not prematurely dismiss risks with a small first-order impact that would have much more significant second- and third-order effects.

There is no need to be rigid or dogmatic in defining first-order, second-order, and third-order effects – it is the linkages in the cascade that matter. Exhibit 1 on the following page lays out a set of current risk cascades for a rail systems manufacturer. While the second- and third-order columns are not neatly classified as microeconomic and macroeconomic effects, the idea of the risk cascade is used powerfully to think through the immediate as well as more long-term impact of the crisis.

## Exhibit 1

### Risk cascade map example – rail systems manufacturer



## 2. Think through the risks to your whole value chain

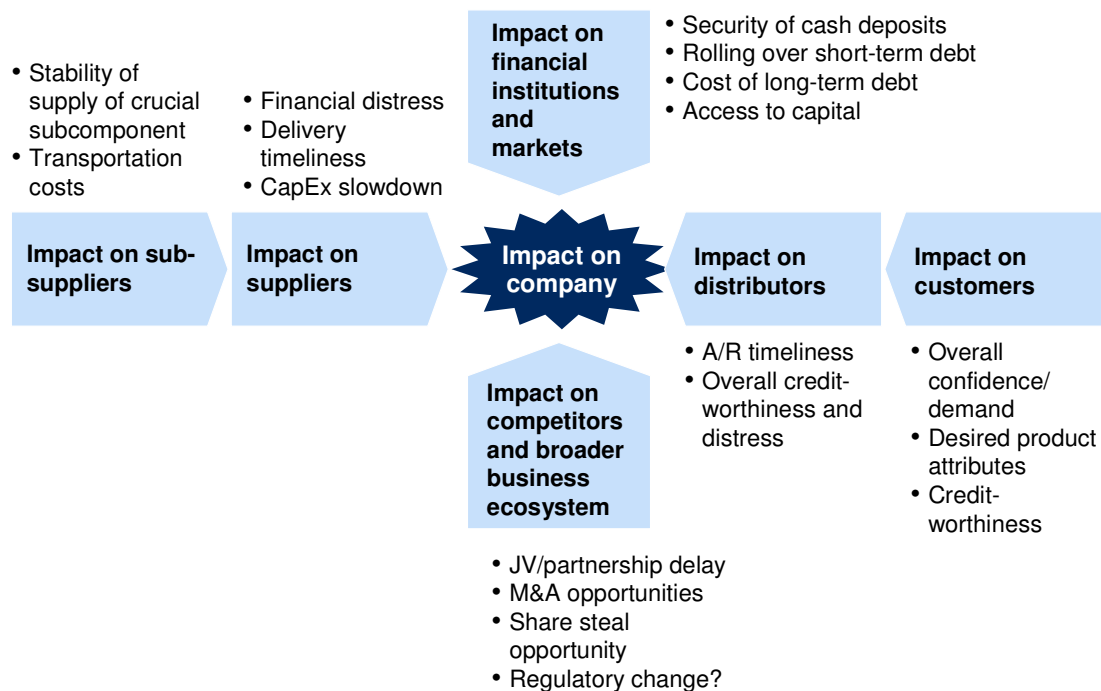
In times of stability and economic growth, limiting your risk assessment to the perimeter of your own business is deceptively easy. You can take contractual relationships at face value, and assume the primary risks are those that will affect what is not “protected” by contract. In uncertain times and economic crises, however, risks cascade along value chains and distress at one link in the chain can quickly propagate, regardless of what is on paper.

During the recent building boom, for example, one company discovered that its investment in resilience by not sole-sourcing an important component (thereby giving up a volume discount) was not helpful. It turned out all three of its component suppliers themselves sourced a crucial part from the same subsupplier, which had a catastrophic plant failure. Further examples can be found in the experience of many companies that are only now waking up to the significant counterparty risks they are facing with their biggest customers or distributors, which may need to renegotiate agreements or may be unable to deliver sales as expected. Exhibit 2 on the next page illustrates the types of effects that might propagate in this way through the value chain.

## Exhibit 2

### Impact cascades through the whole value chain

SIMPLIFIED  
EXAMPLE



This type of indirect exposure occurs for continuous financial risks as well as risk events. Many companies have been whip-sawed by their foreign exchange exposure in recent years, as forex rates have become more volatile and moved significantly as a consequence of other risk events. (Risk cascades in action again!) In particular, many companies correctly understood their “nominal” forex exposure based on their direct fund flows by currency. But they failed to think through their full economic exposure as suppliers renegotiated contracts due to their own forex exposure, and as end-user prices in different markets were forced to move as well.

#### What to do

As part of assessing your own risks, think through the key risks for each player in your whole value chain from end to end. Just as you consider which of your own risks are most significant in aggregate across your business portfolio, consider which are the priority risks in your whole business ecosystem. Then consider in particular which of these risks, while affecting you indirectly for the most part, are yet concentrated enough to require your own targeted response.

Exhibit 3 shows how a company involved in managing major projects evaluated the risks related to three suppliers of an important component. The example pre-dates the current crisis, illustrating the kind of end-to-end risk awareness that should be maintained throughout the economic cycle.

### Exhibit 3

#### Qualitative mapping of supplier risks

SIMPLIFIED  
EXAMPLE

	Supplier A	Supplier B	Supplier C
<b>1 Gap in key competencies</b>			
1.1 Engineering/component design	Low	Low	Med
1.2 Risk management/estimation	Med	Low	Med
1.3 Project management	Low	Low	High
<b>2 Insufficient access to critical fabrication capacity/materials</b>			
2.1 Casting (runner/blades)	Med	Med	Low
2.2 Specialized steel (runner, rotor)	Med	Med	Med
<b>3 Structural supplier risks</b>			
3.1 Financial stability	Low	Med	High
3.2 Number of dependencies/interfaces	Low	Med	High
<b>4 Relationship risks</b>			
4.1 Adaptability of specifications	Low	Med	High
4.2 Importance of client to supplier	Low	High	High
4.3 Alignment with client processes	Low	Med	Med

### 3. Understand your and others' likely responses

Management reacts to changing business conditions. Truly understanding your risk exposure requires thinking about not only what might happen, but also how your company and its competitors will respond. It is the degree and timing of the response that determines your true residual risk exposure.

In recent years, a number of commodity processors have overestimated their exposure to volatile input costs by neglecting to consider their ability to pass through cost increases to their own customers. They hedged some of the input cost increases, but were able to realize extra profit by also increasing prices. In doing this, however, they went beyond neutralizing their exposure – they over-hedged, and a part of their profit came from an implicit bet on increasing input costs. When input costs began to drop, they were stuck with high locked-in input costs, yet competitive dynamics required reducing prices back down, as if they were not hedged.



The over-hedging was accidental, a result of inaccurate assessments of the true level of commodity price risk given the price pass-through.

In another situation, a metals processor performed a high-level risk assessment which correctly noted the industry's standard practice of passing through metals cost changes to customers. The assessment, however, overlooked a huge risk exposure from the timing gaps between signing a contract, purchasing the raw material, and liquidating the remaining scrap after processing. It turned out that the natural volatility of metals prices could effectively wipe out the fairly small processing margin during the couple of months of the timing mismatch.

Competitive dynamics are also important. Airlines, for example, are discovering that their net fuel price exposure is quite different on different routes in their network. The variability is caused by varying levels of competitiveness in local markets, and the presence in some markets of price-setting low-cost carriers with locked-in, fully hedged fuel spend. When fuel prices were going up, the level of fuel cost pain was therefore highly dependent on the specifics of each route network. Now, when fuel prices are going down, some airlines are discovering that by over-hedging at a high level, they locked in a poor cost position which competitors are able to exploit.

#### What to do

When sizing risks you have identified along the value chain, make an explicit point of asking a few key questions:

- Could we pass this risk on to our customers? Are we doing so already, and if so, with what timing delay?
- How would our competitors react in this situation?
- In the case of a specific risk event, how would we naturally respond? Are we correctly assessing our level of residual risk exposure, after the response?

## 4. Stress-test strategy with plausible extreme scenarios

Much company strategy gets stuck in a no-man's land: on the one side are random downside or upside scenarios, whose very randomness invites incredulity; on the other side are overly simplistic quantitative models that fail to anticipate "fat tails" and "regime changes." The way out of this trap involves stress-testing strategy with a small number of unlikely but plausible and coherent macro-economic scenarios. What would happen if . . . a severe economic crisis hit, as bad as anything seen in the past 30 years? energy prices tripled, or fell to the levels seen 5 years ago? a number of bad things struck as a "perfect storm," all at once? What would have to be true for such scenarios actually to come to pass?

The goal of this exercise is not to produce crystal-ball-like predictions, or obsessively to calculate the exact likelihood of this or that event occurring or the precise correctness of the supporting assumptions. Rather the exercise is meant to stretch the thinking about consequences, about how to prepare for them, and about what early warning indicators should be sensibly tracked.

### What to do

Further discussion and instructions on this type of strategic stress-testing can be found in our previous Risk Working Paper (No. 8), “Shaping Strategy in a Highly Uncertain Macro-Economic Environment,” by Natalie Davis, Stephan Görner, and Ezra Greenberg. The approaches there described are particularly powerful when combined with the risk cascade thinking described in this paper. This involves deliberately choosing a broad enough range of scenarios to cover those situations where new second- and third-order effects become relevant, where new value chain effects are likely to come into play, or where different market responses are likely to occur.

## 5. Address the implications of risk, not just the risk map

Far too many risk-assessment efforts generate multi-dimensional risk heat maps that no one can operationalize into specific actions, or detailed black-box-like probability distributions whose true meaning is mostly mysterious. Optimal risk assessment is not designed around a single end product, but as a process for naturally fostering discussions about implications and actions. It is meant to encourage the asking of key questions, which can lead to crucial insights. What early warning signs should you be watching out for? What can you do to improve responsiveness or resilience? What risks are worth mitigating? What risks require extra attention and planning? What risks highlight blind spots in a business plan, and so attract the further attention needed to gain comfort in advance of a decision?

The path to a deeper understanding of a company’s risk exposure furthermore involves the recognition that some risks or uncertainties actually present opportunities, rather than just a downside threat. Inquire into the risks of which your company may be the natural owner and could therefore exploit. What must be clarified to understand whether now is the time to move on such potential opportunities? What changes should you make to your project portfolio or financing strategy?

### What to do

The key is to turn risk management into a dialogue. Our previous Risk Working Paper (No. 1), “The Risk Revolution” by Kevin Buehler, Andrew Freeman, and Ron Hulme (also published as “Owning the Right Risks” in *Harvard Business Review*, September 2008), presents a five-part framework for fostering the risk-management dialogue on a company-wide level. Several mindset changes are at the heart of this process, no matter how widely or deeply it is engaged:

#### From . . .

- Risk management as a separate modeling-intensive exercise
- Risk assessment owned by a specialized risk group
- Success means sleeping well at night

#### To . . .

- Risk management as a conversation-intensive part of strategic planning
- Risk assessment owned by management teams
- Success means adapting to the environment and capturing opportunities

## 6. Be aware of the limitations of insight

The carnage in the economy in recent months – and the dimensions of the government bailouts that have been necessary to maintain any semblance of order – make it clear that many financial institutions and corporations were misguided in believing that their risk assessments were sound and thorough. Predictably, voices can now be heard asserting the prevalence of “fat tail events” and the impossibility of ever being able to predict “the unknown unknowns.” These skeptical voices proclaim the end of risk management as we know it, implying that the lesson is one of greater corporate humility and financial and strategic conservatism. For some companies, especially those that made huge but ill-considered bets on their prowess in predicting risk, this is in fact the lesson, or rather, an important part of the lesson. But for many other companies, which are primarily seeking to continue to execute on and tweak a working business model, the implied lesson dangerously oversimplifies the problem.

The skeptics mentioned above focus on the presence of “unknown unknowns,” surprises we can never even hope to predict – as opposed to “known unknowns,” the uncertainties we at least know are out there. (Nicholas Nassim Taleb named the unknown unknowns “black swans” in his popular book of that title.) The skeptics assert that the existence of these *unknown unknowns* means that the risk assessment war can never be won. There is some truth in their interpretation, especially if you accept the mindsets listed in the “From . . .” column in the table on the previous page. In our opinion, however, of equal importance is that companies maximize their ability to manage their *known unknowns*. The imperatives discussed in this paper strive to help in this regard.

Understanding known unknowns better does not mean, however, that the unknown unknowns have been reduced. Any risk taxonomies or risk models are only as good as their ingoing assumptions, an idea that is well explored in “Probabilistic Modeling as an Exploratory Decision-Making Tool” (Risk Working Paper No. 6, by Martin Pergler and Andrew Freeman). Any analysis of risk cascades and risks throughout the value chain will depend highly on the dynamics considered, and will invariably turn out in retrospect to have missed a few important ones.

### What to do

Highlight big assumptions and simplifications, and discuss them with decision makers rather than hiding them in appendices of reports. Wherever possible, frame your conclusions as “what do we need to believe?” and “what do we need to watch out for?”, rather than “there is a 90 percent likelihood that reality will fall within this range.” Allow yourself time to reflect on the assumptions, and to discuss them with others in the organization. Connect to primary sources – the people within your organization closest to the issue – rather than with filtered and refined consensus estimates bubbling up through the hierarchy. Also, ensure a mix of pessimists and optimists in the discussions. Finally, recognize that *unknown unknowns* will always be out there, and that the best risk assessment approach does not strive to identify all of them in advance. Instead, it asks whether you are resilient and responsive enough to turn them into *known unknowns* once they begin to make their presence felt.

\* \* \*

We have highlighted these “six imperatives” for risk assessment in the context of the current economic downturn, since they are particularly important for upgrading risk assessment capabilities to manage through the crisis. We strongly believe, however, that these imperatives are in fact the building blocks for risk assessment throughout the economic cycle, not only in bad times. They may offer some comfort to companies currently struggling just to survive the immediate turmoil. But those companies that are able to apply these imperatives will be better prepared to handle the ongoing economic roller-coaster ride, better able to profit from arising opportunities, and better positioned when the next upturn comes.

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