

An Introduction to Insurer Strategic Risk  
Topic 1: Risk Management of an Insurance Enterprise

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Originally published in a modified format in *Enterprise Risk Analysis* (Guy Carpenter & Company, LLC, 2007) pp. 144-172. Reprinted by permission of the author and the publisher.

### 1. Strategic Risk – History and Definition

The concept of strategic risk (SR) is not well defined and therefore not well understood. The problem may start because the word strategy itself is neither well defined nor well understood. The Merriam-Webster Online Dictionary provides three definitions:

- 1. (a) the science and art of employing the political, economic, psychological and military forces of a nation or group of nations to afford the maximum support to adopted policies in peace or war, (b1) the science and art of military command exercised to meet the enemy in combat under advantageous conditions, (b2) a variety of or instance of the use of strategy*
- 2. (a) a careful plan or method: a clever stratagem, (b) the art of devising or employing plans or stratagems toward a goal*
- 3. an adaptation or complex of adaptations (as of behavior, metabolism or structure) that serves or appears to serve an important function in achieving evolutionary success <foraging strategies of insects>*

Taking liberties, and with willingness to expand the military context to general organizations and corporations, the proposed unified definition of strategy is:

A science and art of planning,  
Using political, economic, psychological and organizational resources,  
To achieve major organizational goals.

This unified definition corresponds well with the definition in the report of the General Insurance Research Organization (GIRO) Working Party on “The Application of Strategic Models to Non-Life Insurance Markets” ([www.actuaries.org.uk/files/pdf/proceedings/giro2005/Massey.pdf](http://www.actuaries.org.uk/files/pdf/proceedings/giro2005/Massey.pdf)).

A strategy is a long term series of actions designed to take a company from its current state to its desired future state, and aims to provide a sustainable competitive advantage over other companies in the same market.

The GIRO Working Party goes on to clarify what strategy is not:

1. Strategy goes beyond pure business planning and, in particular, considers a wider breadth of issues. Formulating a company's strategy requires an understanding of the market it is competing in, where it sits relative to its competitors and how it will compete and outperform its rivals.
2. Strategy is also not tactics; the two are often confused. Tactics tend to be short-term measures and are described in significant detail. Strategy is broader themes/features/styles that a company may want to exploit.

Another possible source of confusion regarding strategic risk may be that two loaded terms – “strategic” and “risk” – are combined in one phrase, without clear grammatical demarcation. Reasonable people could interpret the phrase quite differently. Some of the definitions focus on strategic risk-taking – intentional risk-taking as an essential part of the company's strategic execution; others are aimed at strategic risk – unintentional risks as by-products of strategy planning or execution.

As an example, consider this definition offered by the Office of the Comptroller of Currency (OCC) in its 1998 document Emerging Market Country Products and Trading Activities:

*Strategic risk is the risk to earnings or capital arising from adverse business decisions or improper implementation of those decisions. This risk is a function of the compatibility between an organization's strategic goals, the business strategies developed to achieve those goals the resources deployed against these goals and the quality of implementation. The resources needed to carry out business strategies are both tangible and intangible. They include communication channels, operating systems, delivery networks and managerial capacities and capabilities. The definition of strategic risk focuses on more than an analysis of the written strategic plan. Its focus is on how plans, systems and implementation affect the franchise value. It also incorporates how management analyzes external factors that impact the strategic direction of the company.*

The OCC's definition is strategic risk of the second kind – unintentional risks as by-products of strategy planning or execution. Its inclusion of systems is interesting and is symptomatic of the confusion. Compare this definition with the definition of operational risk from the Basel Committee on Banking Supervision (the Committee)[2]:

*The risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. This definition includes legal risk, but excludes strategic and reputational risk.*

Note the Committee's specific exclusion of strategic risk, but its inclusion of systems failure, which the OCC included in strategic risk. This instance of overlap is

far from unique. In fact, many operational, reputational, financial and hazard risks could also potentially be of strategic origin or significance.

## 2. Strategic Risk Management Research to Date

The first instance of the term “strategic risk management” (SRM) in scientific literature appears to be in Miller [5], “A framework for integrated risk management in international business.” Miller highlights the confusion regarding inconsistent definitions of the term “risk.” It can refer to unanticipated, negative variation in business outcome variables (i.e., effects) or to factors (external or internal) that impact on the risk experienced by the firm (i.e., actual sources of risk). Miller adopts the following usage convention:

Risk refers to unpredictability in corporate outcomes (effects); and  
Uncertainty refers to the unpredictability of environmental or organizational variables that impact corporate performance (sources).

Miller’s “strategic risk” actually refers to “strategic moves that can potentially mitigate the risks associated with the uncertainties” outlined in the previous section of his paper. Thus, what we have so far defined as strategic risks, Miller would consider strategic uncertainties – unpredictable impacts of strategies. It is a little ironic that the person credited with coining the term actually uses it in a manner quite different from that used in much of the risk management literature.

Another of the seminal papers on strategic risk is: “Toward a Contingency Model of Strategic Risk Taking,” by Baird and Thomas [1]. Like Miller, Baird and Thomas return to the origins of what science there is and find clarity and precision to be somewhat lacking. They reference a 1921 work by Knight [4] as the source for defining risk as “a condition in which the consequences of a decision and the probabilities associated with the consequences are known entities.” They differentiate this from uncertainty, in which neither consequences nor probabilities are known. They define strategic risk-taking as:

“Corporate strategic moves that cause returns to vary, that involve venturing into the unknown, and that may result in corporate ruin – moves for which the outcomes and probabilities may be only partially known and where hard-to-define goals may not be met.”

Baird and Thomas outline the following important elements of strategic risk:

- Voluntariness of exposure
- Controllability of consequences
- Discounting in time
- Discounting in space
- Knowledge of risky situation
- Magnitude of impact
- Group/individual factors

Concerns with risk have been factored into strategic decision making using several simplistic approaches:

- Obtaining more accurate forecasts

Adjusting factors empirically  
Raising thresholds for required returns  
Estimating best, probable and worst case outcomes—i.e., rudimentary scenario analysis and  
Considering selected probabilities on key factors

Slywotzky and Drzik [6] describe SRM as a means to devise and deploy a systematic approach for managing strategic risk, categorized as follows:

1. Industry – capital intensiveness, overcapacity, commoditization, deregulation, cycle volatility
2. Technology – shift, patents, obsolescence
3. Brand – erosion or collapse
4. Competitor – global rivals, gainers, unique competitors
5. Customer – priority shift, power, concentration
6. Project – failure of R&D, IT, business development or M&A
7. Stagnation – flat or declining volume, price decline, weak pipeline

Ironically, Slywotzky and Drzik list as risks what Miller would consider uncertainties or sources. Still, their contribution is valuable as a cataloguing of the major components of a strategic risk analysis.

Hertz and Thomas [3] develop the concept of SRM further to strategic risk analysis, whereby risk analysis:

“is an input for the strategy development process, aiding strategy formulation, evaluation, choice and implementation. No distinction is drawn between strategic risk analysis and strategy formulation. Instead, both are viewed as parts of an iterative, adaptive and flexible policy dialogue process.”

This definition focuses on how to make better strategy decisions and therefore would correspond closely to the strategic error concept. Hertz and Thomas' work is also valuable in providing a detailed, practical example of integration of risk analysis into a corporate strategic decision making process.

### 3. Examples of Strategic Risks for an Insurer

It is instructive to see how many of the strategic risks from Slywotzky and Drzik might impact an insurer:

Industry – capital intensiveness, overcapacity, commoditization, deregulation, cycle volatility  
Magnitude of risk: very high  
Insurance markets suffer from all of these conditions.

Technology – shift, patents, obsolescence  
Magnitude of risk: low  
Except for possible innovations in distribution for personal lines via the Internet.  
One area of potential technological innovation is data management.

Brand – erosion or collapse

Magnitude of risk: moderate

Essentially, insurance “products” are claim checks. Therefore, it is difficult for insurers to differentiate based on product content. Either the check is good, or it isn't. Therefore, insurers often differentiate on price or services. If one interprets the insurer's “brand promise” as including a reputation for fair claims handling, then loss of this reputation through adverse press or class action suits could definitely destroy franchise value.

Competitor – global rivals, gainers, unique competitors

Magnitude of risk: moderate

Predatory pricing is a significant risk, since market share can be grabbed fairly easily by carriers willing to write the coverage at a discount to incumbent carriers.

Customer – priority shift, power, concentration

Magnitude of risk: moderate

This risk is probably a bigger issue for large commercial insurance business.

Project – failure of R&D, IT, business development or M&A

Magnitude of risk: high

Companies have a long track record of value-destroying mergers and acquisitions. They are also notoriously small investors in R&D and IT, which is ironic given the nature of the intellectual capital franchise.

Stagnation – flat or declining volume, price decline, weak pipeline

Magnitude of risk: high

This risk is highly correlated to cycle volatility management. Insurers have a difficult time redeploying their assets, since they are essentially intellectual assets with a large degree of task specificity and stickiness. Insurers also suffer from extensive reporting lags and potentially mismatched revenue and expense. It could be argued that part of the impetus driving insurers to continue to write business at inadequate prices is the need to fund current-year fixed costs (“plant” expenses).

Some other examples of strategic risks using the Slywotzky and Drzik framework are:

(Competitor) Entrance into new (or significant growth in existing) lines or territories with inadequate underwriting expertise, pricing systems, price monitoring capabilities, policy servicing capabilities, understanding of regulatory requirements, claims handling staff, etc.

(Project) Mergers or acquisitions entered into without contemplating integration costs or timelines, cultural incompatibilities, reserve deficiencies, etc.

(Competitor) Destructive competition from multiple competitors simultaneously targeting the same market segment (unilateral planning, failure to anticipate strategic changes of competitors).

(Stagnation) Flawed organizational response plans to market price cycles, including maintaining premium volume and market share during price declines, and improper performance incentives for underwriters.

Planning (particularly plan loss ratio setting) process not fully integrated to internal financial indicators, external benchmarks, which fails to update, susceptible to systematic optimism.

#### 4. Strategic Risk Management and Scenario Planning

Effective strategic risk management begins with scenario planning. Schoemaker [6] wrote a seminal paper on scenario planning, "Scenario Planning: A Tool for Strategic Thinking." He describes several key characteristics of scenario planning:

The range of future outcomes is simplified into a limited number of possible states called scenarios, each of which tells a story of how various elements might interact under certain conditions.

Scenarios are tested for internal consistency and plausibility.

The scenarios are used to explore the joint impact of various uncertainties.

Scenarios change several variables at one time, trying to capture the new states that will develop after major shocks or deviations in key variables.

Scenarios are more than just simulation output. They include subjective interpretations of factors that often cannot be explicitly modeled.

Schoemaker summarizes as follows: "In short, scenario planning attempts to capture the richness and range of possibilities, stimulating decision makers to consider changes they would otherwise ignore."

Schoemaker outlines the key steps in the scenario planning process:

1. Define the scope – time frame and scope of analysis (geographic, product segments).
2. Identify the major stakeholders – customers, suppliers, competitors, employees, shareowners and regulators.
3. Identify basic trends – include their influence on the organization.
4. Identify key uncertainties – unknown leverage points of impact.
5. Construct initial scenario themes – combine key elements.
6. Check for consistency and plausibility – are trends compatible within the chosen timeframe? Do the outcomes fit together? Are major stakeholders placed in realistic positions?
7. Develop learning scenarios – the goal is to identify themes that are strategically relevant. Naming the scenarios is also important.
8. Identify research needs – flesh out the understanding of trends and uncertainties.
9. Develop quantitative models – assess whether certain interactions should be formalized via a quantitative model.
10. Evolve toward decision scenarios – iterative process to converge to scenarios used to test strategies and generate new ideas.

## 5. Scenario Planning – Insurance Example

Clearly, scenario planning represents a significant departure from typical industry planning practice. However, an insurer could implement a rudimentary form of scenario planning. The prerequisite leap would involve moving from one detailed but almost certainly wrong plan to a set of less detailed plans based on key scenarios. Scenario planning is a first-order approximation of the range of possible states of the world.

The best place to try scenario planning at an insurer would be in the process used to determine the plan portfolio mix, defined as the planned combinations of written premium and corresponding written loss ratios by line of business. Loss ratio will be a function of price level. We will assume the company can accurately monitor price changes on renewal business.

### 5.1 Traditional Unilateral Planning Approach

A traditional insurer planning exercise begins by defining key plan components (by line of business):

- Base loss ratio
- Cost trend
- Price change
- Target premium volume
- Loss ratio

This plan is built upon “plan estimates,” which arguably should be unbiased, realistic expectations but may be more optimistic due to the pressing need to meet overall corporate profit or premium volume targets. Once developed and presented to senior management, “the plan” can often take on a life of its own. Managers are reluctant to deviate from plan, despite market conditions. Underwriting units want to “make their plan numbers,” by any means necessary, which creates pressure to book plan targets despite market realities. What may have initially been intended as a summary of bottom-up, reality-based figures can become an institutionalized fiction that requires enormous energy to maintain against the inevitable tide of financial reality.

To demonstrate the risk to the organization of the traditional planning approach, we will isolate our focus on one line of business (LOB):

Base loss ratio	80%
Cost trend	6%
Price change	0%
Target premium volume	\$100M
Plan loss ratio	$84.8\% = 80\% * (1.06)$

With the best of intentions, it is likely that regardless of how the underwriting year plays out, the message to ownership and the initial financials will be very close to these figures. For example, if actual price change is -10 percent, the following may still occur:

Recorded price change	0%
Written premium volume	\$100M
Recorded loss ratio	84.8% (based on 0% price change)
Actual loss ratio	94.2% = 84.8% / (1.0 – 10%)

Not only will the company now have an unforeseen reserve deficit, it may have an overall portfolio mix that is not what it intended. In other words, had the leadership known at planning time that this LOB would be priced at a 94.2 percent loss ratio, it may have wanted far less volume – perhaps \$50 million rather than \$100 million. It may even have issued an edict to hold price and let premium volume fall where it may. However, without having thought through the possibilities, whatever responses they ended up with were an aggregate result of various bottom-up decisions. The commitment to one (and only one) plan leads to organizational inertia, inflexibility that is unrealistic and potentially detrimental to the firm.

## 5.2 Basic Scenario Planning (SP) Example

Consider the planning for our LOB under SP. The single point estimate for price change would be expanded as follows:

<u>Scenario</u>	<u>Price Change</u>	<u>Likelihood</u>
Optimistic	+5%	10%
Realistic	0%	50%
Pessimistic	-10%	40%

SP requires the firm to decide in advance:

The possible range of outcomes or scenarios, with relative likelihood; and  
Its responses should each scenario come to pass.

The (controllable) decision variables are price change and premium volume. They are interlinked, of course, by the demand curve. For example, the firm could produce something like this:

<u>Price Change</u>	<u>Likelihood</u>	<u>Response Plans</u>
+5%	10%	\$150M @ +5% (ride the wave)
0%	50%	\$100M @ 0% (as expected)
-10%	40%	\$50M @ -10% (bail out)

The three response plans would need to be laid out in enough detail to give them sufficient operational weight to drive decision making and behavior. That is, the firm would produce a “set of optional plans,” one of which would be activated based on how market conditions play out. In concert with this, the firm would need market monitors to assess which scenario appears to be playing out.

Several advantages are gained from this small change:

The company thinks through responses beforehand. They can prescreen and agree on the best response. They can also save time during crises by having strategic action plans laid out and ready for use.

Organizational inertia is reduced, because a degree of flexibility is now built into the system. The unrealistic urge to “make the numbers” at all costs is reduced.

The resulting portfolio mix is tailored to the market realities that emerge.

### 5.3 Model Expansion

Expanding the example, the firm would develop a combined scenario set including all lines of business. A great deal of coordination would be required by the corporate planning team to craft the LOB perspectives into credible, internally consistent corporate scenario sets. Of particular interest is the inclusion of co-movement potential (e.g., market shocks, multiline price deterioration). The response plans will also be more politically charged, as limited underwriting capacity must be allotted across the organization. While this capacity allotment will be difficult, it is better for the organization to go through this during a scenario planning process than in the heat of a market crisis.

## 6. Advanced Scenario Planning and Enterprise Risk Modeling

Scenarios are really manually constructed equivalents to generated simulations from an ERM model. Over time, as firms grow more comfortable and skilled in their modeling efforts, their ERM models should produce rich, credible sets of scenarios. The scenarios, in turn, open up the possibility of dynamic strategy testing. That is, the firm can use its ERM model to determine the most effective decision making approach, where effectiveness can be tested across a broad spectrum of simulated scenarios. This use of ERM modeling represents proactive strategic risk mitigation, even strategic reward maximization.

There are examples of such strategy testing in asset risk management. Asset strategies are tested by simulating the returns of portfolios selected by different strategies. Each strategy is represented as a set of asset selection rules. These rules are repeatedly applied to “rebalance” the portfolio in response to the environment changes as the simulated scenario progresses. Examples of rebalancing activities might include selling bonds that have matured, reducing allocation to an asset class that has appreciated in value relative to other classes or buying more taxable or tax-exempt investments in response to portfolio tax position. This process is repeated for each strategy, for each scenario. The “best” portfolio is the one whose distribution of total returns is valued most highly. The evaluation can be based on both reward goals and risk constraints.

The first step in strategy testing is the capture and encoding of essential environmental variables necessary to determine the “state of the world” and, therefore, ultimately used to select the course of action.

Users must also define performance quality in terms of desirable goals (e.g., net income, economic value) and undesirable downside constraints (e.g., maximum tail-value-at-risk).

Finally, the user must specify action rules that describe portfolio responses to market environment changes. As an example, a strategy to “hold price” would respond to

market price decreases by holding firm to price and losing substantial premium volume and market share. Another strategy example might be the allocation of underwriting capacity based on anticipated price adequacy levels. The key is to express these responses as a set of mathematical rules that the simulation model can convert into portfolio changes.

## 7. Agent-Based Modeling and Strategic Interaction Effects

The process just described represents unilateral strategy testing – testing of one market participant’s strategic actions in a static market environment. There is another dimension of strategic risk that cannot be captured in such an approach – the risk of negative impacts due to the interaction effects of many market participants executing their strategies simultaneously.

Capturing the dynamics of simultaneous action requires agent-based modeling (ABM). ABM is a method for studying systems composed of interacting “agents” – independent entities capable of assessing the environment, selecting courses of action and effecting change on the environment based on those selected courses. Complex systems also have what are called “emergent properties” – qualities or characteristics that arise from the interactions of the agents. Typically, one cannot predict these properties simply by aggregating the properties of the individual member agents.

The real quantum leap in strategic risk assessment comes from modeling strategic interaction effects in a simulated insurance market populated with “insurer agents” following various strategies. Some could be disciplined technical pricers, while others could chase market share. The user could then test the likely impact on the market, and on its own results, of following various strategies. This exercise goes farther than previous strategic risk assessments by including the interaction effects of multiple agents competing.

As an example, a user might plan (in isolation) to target a market segment identified (using public information) as profitable. It could develop detailed plans of how much premium it will write at what profitable loss ratio. Such a plan sounds viable in principle and looks good on paper. However, it may fail to factor in the possibility that many competitors have come to the same conclusion regarding this market segment (as the information is public). If all these competitors commit to growth in that segment, the competition will lead to price decreases that (ironically) undermine the profitability that made the segment attractive in the first place.

## 8. Conclusions

What we have outlined here is the beginning of strategic risk management for insurers. Clearly, there is significant organizational learning and change required, as well as education of key stakeholders regarding the new landscape. However, it is our contention that this effort will be rewarded with superior operating performance.

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