

Beat Habegger (ed.)

INTERNATIONAL HANDBOOK ON **RISK ANALYSIS AND MANAGEMENT**

PROFESSIONAL EXPERIENCES

Series Editors

Andreas Wenger, Victor Mauer, and Myriam Dunn Cavelty

Center for Security Studies, ETH Zurich

The **International Handbook on Risk Analysis and Management** is also available on the Internet in full text: www.crn.ethz.ch.

Beat Habegger (ed.)

Series Editors Andreas Wenger, Victor Mauer, and Myriam Dunn Cavelty

Center for Security Studies at ETH Zurich (Swiss Federal Institute of Technology)

© 2008 Center for Security Studies

Contact

Center for Security Studies

Seilergraben 45–49

ETH Zentrum/SEI

CH-8092 Zurich

Switzerland

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of the Center for Security Studies.

Layout and Design Fabian Furter

Fonts Adobe Garamond Pro and The Sans (Cover)

ISBN 3-905696-18-5

CONTENTS

Preface	5
Foreword	9
<i>Bengt Sundelius (Swedish Emergency Management Agency)</i>	
Introduction	
Risk Analysis and Management in a Dynamic Risk Landscape	13
<i>Beat Habegger (Center for Security Studies, ETH Zurich)</i>	
Civil Defense Organizations	
Political Risk in Civil Protection – A Practitioner’s View	35
<i>Giulio Gullotta (German Federal Office of Civil Protection and Disaster Assistance)</i>	
Analyzing Critical Dependencies in Swedish Society	51
<i>Sara Myrdal (Swedish Emergency Management Agency)</i>	
Risk Management in the Context of Switzerland’s Civil Protection Mechanism	77
<i>Stefan Brem and François D. Maridor (Swiss Federal Office for Civil Protection)</i>	

Intelligence Services, Armed Forces, and Multilateral Institutions

Intelligence and Early Detection of Threats in Switzerland <i>Matthias Klopstein (Swiss Federal Office of Police)</i>	93
Strategic Warning for Criminal Intelligence <i>Daniel R. Morris and Gregory Baudin-O'Hayon (King's College London / Criminal Intelligence Service of Canada)</i>	101
Future Analysis as an Instrument of Strategic Planning <i>Roland Kaestner (German Bundeswehr Academy)</i>	117
Early Warning and Political Risk Analysis in the Organization for Security and Co-operation in Europe (OSCE) <i>Erik Falkehed (OSCE Conflict Prevention Center)</i>	139

Financial and Insurance Businesses

Early Detection and Management of Emerging Risks in the Financial Services Industry: Lessons from Insurance Businesses <i>Bruno Käslin (Institute for Insurance Economics University of St. Gallen)</i>	155
Swiss Re Political Country Risk Rating <i>Marco Lier (Swiss Reinsurance Group)</i>	175
Political Risk and Public Policy Management at Credit Suisse <i>René P. Buholzer and Manuel Rybach (Credit Suisse)</i>	185

Conclusions

Current Practices and Future Challenges of Risk Analysis and Management <i>Beat Habegger (Center for Security Studies, ETH Zurich)</i>	203
---	-----

Annex

Glossary of Methods of Risk Analysis	217
Authors	227

FINANCIAL AND INSURANCE BUSINESSES

EARLY DETECTION AND MANAGEMENT OF EMERGING RISKS IN THE FINANCIAL SERVICES INDUSTRY: LESSONS FROM INSURANCE BUSINESSES

Bruno Käslin

.....

Organizations interact with their environment at many different levels. Therefore, surprising events or unanticipated trends in the environment can quickly lead to negative implications for a company's financial outlook. "Emerging risks", which arise from changing environmental conditions, are especially relevant for the insurance industry. We define emerging risks as new or newly occurring risks or issues with an uncertain but high damage potential. The early detection, analysis, and evaluation of emerging risks allows insurers more time to make appropriate decisions concerning the management of these risks. With adequate early-warning systems, insurance companies can react faster and make better-informed decisions in response to trends and developments. This paper describes the character of emerging risks and their implications for the insurance industry. Based on a detailed analysis of four successful implementations of emerging risk management systems in the insurance industry, four dimensions – organization, processes, culture, and information technology – are introduced to describe important strategic implications of emerging risks for the insurance industry. The research presented is a unique study as it is the first examination of emerging risk management procedures in the insurance industry.

.....

1 Introduction

A current survey on the impact of diverse trends and developments on the insurance industry shows that the topic of “emerging risks” is of great significance for insurance managers.¹ In addition, more than 40 per cent of the respondents to a recent CEO survey from PricewaterhouseCoopers stated that the greatest risks to their organization’s market value are “unknowns”.² The discourse on emerging risks has intensified recently and in many insurance firms the topic is of high priority.³ Many events (e.g., those organized by the Institute of Insurance Economics, Swiss Re, E+S Reinsurance, and Handelsblatt), research programs (e.g., the Chief Risk Officer Forum Emerging Risk Initiative),⁴ and journal articles are further evidence of the increasing interest in this topic.

2 Definition and characteristics of emerging risks

In the insurance industry, the term “emerging risks” refers to risks that are new or have not yet been discovered, which have an uncertain damage potential in the near or long-term future and thus could have serious consequences for insurers and reinsurers. According to the major reinsurers and insurers, emerging risks include phenomena such as electromagnetic fields (EMF), gene technology, nanotechnology, pervasive computing, oc-

- 1 Unpublished survey by the Institute of Insurance Economics at the University of St. Gallen (2005/2006). Survey participants included more than 250 senior management professionals in the insurance industry.
- 2 PricewaterhouseCoopers, *Uncertainty Tamed? – The Evolution of Risk Management in the Financial Services Industry* (2004), p. 3 <<http://www.pwc.com/images/gx/eng/fs/072704eiurisk.pdf>>, accessed 8 August 2007.
- 3 As Munich Re writes in the 2nd Chief Risk Officer Assembly 2006 Conference Report: “Emerging risks are by far the biggest challenge for the insurance industry.” Cf. Munich Re, *2nd CRO Assembly 2006 Conference Report* (2007), p.8 <http://www.munichre.com/publications/302-05241_en.pdf>, accessed 8 August 2007.
- 4 See <<http://www.croforum.org/emergingrisk.ecp>>.

cupational diseases such as silicosis or asbestos, pandemics, new financial distresses, or reputation risks.⁵

The danger from “traditional” risks is, almost by definition, immediately obvious and includes, for example, risks emanating from cars, bridges, or aviation; emerging risks are very different in this regard. Due to the most distinctive property of emerging risks – their novelty – it is very difficult to assess the extent of potential loss; there is no loss experience to aid an evaluation. Therefore, rating and pricing these risks is highly challenging. It may be that damage from a particular risk is already occurring, but the time delay before its effects are noticeable and measurable is so great that insurers cannot make a proper assessment until years later.

Asbestos is a near-perfect example: the insurance industry did not realize the scope of the risk posed by asbestos soon enough and is now paying a commensurately high price. Emerging risks can also have a potential for loss accumulation and/or serial loss, as well as global and multi-line implications. Therefore, when emerging risks finally do materialize, their effects can be dramatic and may even threaten a company’s solvency.

3 Driving forces behind emerging risks

Emerging risks appear with changes in the risk universe. The risk universe is expanding ever faster due to several driving forces, factors, and trends related to developments in the technological, societal, economic, and legal arenas. Among these forces are the following:

- **Technological developments** lead to innovation and create many business opportunities and the possibility of great economic wealth. However, every technology has its downside potential too, which can be triggered, for example, by design and development errors as well as by application errors.

5 Christian Lahnstein, ‘Wie gehen Versicherer mit emerging risks um?’ *Börsen-Zeitung*, February 2006, p. 1.

- Changes in **social behavior** have consequences for the risk universe. For example, people now generally live longer due to better medicines. This development has consequences for the life insurance industry. Stress at work and at home has increased, leading to greater consumption of fast food and convenience food, which may very well have implications for the health insurance industry.
- Globalization has had a huge effect on **economic development**. Global trade is rapidly expanding, creating increasing risk potential: loss potential becomes very great when people, value, and infrastructure become highly concentrated. The pursuit of economic wealth is accompanied by a higher degree of vulnerability and extreme loss potentials due to the complexity and interconnectedness of the modern economic system.⁶
- The risk universe can also be fundamentally changed by changes in the **legal framework**. New laws, unexpected court decisions, and the changing interpretation of laws can all change a risk from one that was formerly rather well known to one of suddenly alarming proportions. For the insurance industry, especially relevant developments include changes in liability law, damages law, procedural law, and insurance law.⁷

In summary, the risk universe is subject to many forces of change, and everything seems to move faster. This has some real and serious consequences for the risk universe:

- Complexity, uncertainty, and ambiguity increase.
- Conditions change more rapidly.
- Increasing vulnerability with respect to technological, social, and natural risks.

6 Matthias Haller, 'Erübrigt sich angesichts der Globalisierung der Risiko-Dialog?' in Peter Gomez, Günter Müller-Stewens, and Johannes Rüegg-Stürm (eds.), *Entwicklungsperspektiven einer integrierten Managementlehre* (Bern: Haupt, 1999), pp. 99ff.

7 A good overview of liability trends and developments is found in Tom Baker, 'Insuring Liability Risks', *The Geneva Papers on Risk and Insurance*, 29 (January 2004), pp. 87–106.

- Risks are difficult to discover and assess and often manifest themselves before adequate preparations can be made.
- Damage potential is bigger, possibly even catastrophic.
- The risks have linked physical, social, and economic effects.

4 Consequences for the insurance sector

An insurance company's business model generally consists of accumulating money (premiums) by agreeing in advance to pay financial compensation to the policyholder if a pre-specified uncertain event occurs. The fixed payments the insurer agrees to make are often uncertain in their scope and timing.⁸ Emerging trends, developments, and changes in the risk universe can have an enormous impact on the insurance business:

- Policies can span decades (e.g., life insurance policies); thus, intervening events or issues can have consequences that were completely unforeseen at the time the policy was written.
- Over time, general trends and developments can become emerging risks and, possibly, actually manifest themselves as risks even later. This process may be very slow and the level of uncertainty very high. Often, it is hard to discover, let alone evaluate, these risks.
- Obviously, insurance companies do not have extensive (or even any) loss statistics for emerging risks. This is a challenge because the traditional method of setting rates is based on statistical data.
- Another problem is that emerging risks are often already covered by the insurance portfolio because, previously, they were not known to be emerging risks or, indeed, any sort of risk at all. Nevertheless, claims associated with these risks have to be paid, even though the premiums paid for them are now known to be inadequate.

8 Swiss Re, *The Risk Landscape of the Future* (2004), p. 7 <<http://www.swissre.com>>, accessed 8 August 2007.

- For emerging risks, causation, as well as the actual consequences for the insurer, may not be clearly defined. In particular, causal relationships cannot always be verified.
- Even after emerging risks have been identified and evaluated, their actual effect on the insurer is still difficult to ascertain with any degree of certainty. Which of the risks will materialize? Which of the risks will have the most significant consequences for the insurer? What is the probability of occurrence? How quickly will the risk materialize?
- Emerging risks of global scope – such as pandemics – can have extreme consequences for the insurance industry, especially when different geographic regions, many industries, or several insurance lines of businesses are exposed to a single risk. In this situation, one of the fundamental principles of the insurance business – diversification – will be of no use at all and may even aggravate the situation.

To successfully overcome these challenges, insurers need an effective way of dealing with emerging risks. An early-warning system is a good start, and can help insurers avoid risks, reduce surprise, and win a little extra time for planning and implementing appropriate action. An early-warning system starts with the basic premise that in reality, emerging risks are not complete surprises – it is usually possible to detect a “weak signal” of an emerging development. These weak signals need to be anticipated, analyzed, and evaluated so that appropriate communication, mitigation, and product development measures can be taken. In the insurance industry, such early-warning systems are widely used, but are rarely formalized or standardized. A more systematic approach to early detection and the handling of new trends and developments could be of great benefit to insurers:

- It may prevent surprises: anticipation of imminent developments can promote action and solutions in advance, leading to stability and protection of the balance sheet, thus helping to maximize shareholder value.

- It provides more time for strategic maneuvers: an insurer who has had time for thorough planning and implementation of countermeasures against hazardous risks will gain a competitive advantage, because the company will have been able to take advantage of new opportunities in terms of relevant and timely products and services.
- It can lead to more effective, more efficient management. In particular, if a standardized procedure is in place to deal with emerging risks, resources can be used most efficiently; knowledge can be processed and managed, instead of being relegated to a “data dump”; information can be transmitted quickly and appropriately to partners and customers; duplication of effort will be avoided – in short, the firm will be working at peak efficiency to deal with the emerging risk, thus ensuring its survival, possibly even its increased prosperity.

5 Empirical examination of systematic handling of emerging risks in the insurance industry

This study focuses on how the insurance industry deals with emerging risks. The research framework is illustrated in Figure 1 (on p. 162). First, the organizational dimension of handling emerging risks was analyzed. Second, the processes of managing emerging risks were examined, including the identification, analysis, evaluation, and implementation of emerging risks in the insurance business. The third step consisted of looking at the systems, tools, and information technology chosen for managing emerging risks. Last, but not least, the cultural aspects of managing emerging risks were explored.

The empirical analysis is based on a thorough examination of four companies in the insurance industry: two insurance and two reinsurance companies. The analysis was based on expert interviews. Since there is very little literature covering these topics, the analysis is descriptive. The following sections detail results from the data analysis.

Culture, Attitudes, Behaviors

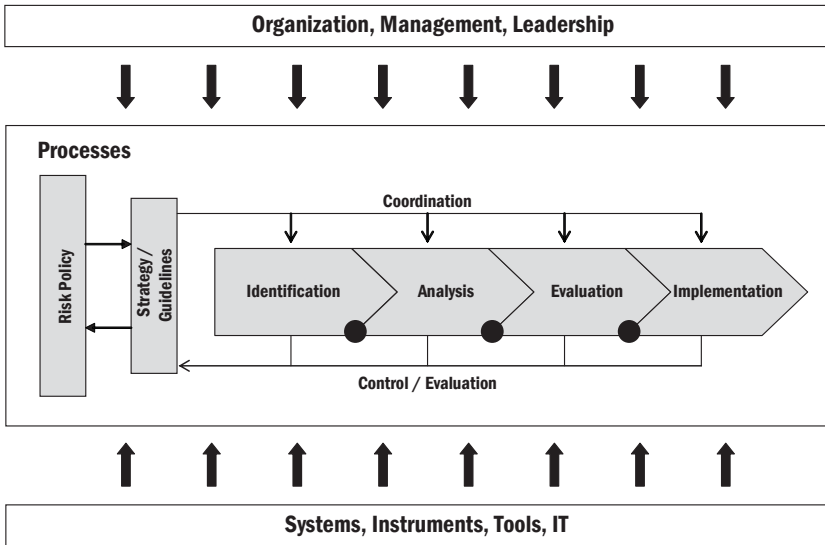


Figure 1: Research framework

5.1 Organization of emerging risk management in the insurance industry

The majority of the examined firms use a structured and coordinated approach. In all four firms, there is a high-ranking committee (e.g., the group risk committee, the group underwriting committee, etc.) or single person (e.g., the chief risk officer, the group chief underwriting officer, etc.) that sets the strategy and issues guidelines for managing emerging risks.

Within the boundaries of the strategy, the units responsible for overall business operations work to detect emerging risk signals early on and implement the insights derived from analysis and evaluation of emerging risks into their business units/countries. The firms' emerging risk management activities are usually coordinated via a centralized project team/department or, alternatively, the responsibility is decentralized through an internal network at the business-unit level.

The majority of the examined firms analyze the implications of emerging risks not only at a business-unit level, but also holistically. They use models to analyze the effects of certain potential threats on the firm's assets and liabilities and implement countermeasures as soon as feasible. The responsibility for those measures is distributed in various ways; sometimes, it lies with the emerging risk management team, sometimes with the department of the chief risk officer, and so forth.

All the project teams responsible for managing emerging risks are interdisciplinary and heterogeneous, thus combining different cultural and functional backgrounds, geographic regions, and expertise, which facilitates a global and holistic view of emerging risks.

Some of the firms have a very structured and formalized process for managing emerging risks. The workflows are defined, every process step is clearly documented, and competencies are specified. There are clear personal/time guidelines and control/reporting procedures that enable top management to view the actual emerging risk landscape at all times. At other firms, the process of managing emerging risks is deliberately less structured, with more leeway allowed in searching for the best organizational solution on a case-by-case basis. The information flows are still structured, but there is room for "customized" solutions. Some insurance firms have no formalized or holistic early-warning systems for detecting emerging risks, but this does not mean that these firms are not concerned with the issue.

In summary, there appears to be a general trend in the insurance industry toward network-based early-detection systems for emerging risks (see Figure 2 on p. 164). All the examined firms use internal and external personal networks to gather information regarding emerging risks. The personal networks converge on a "big radar screen" that covers the entire emerging risk landscape.

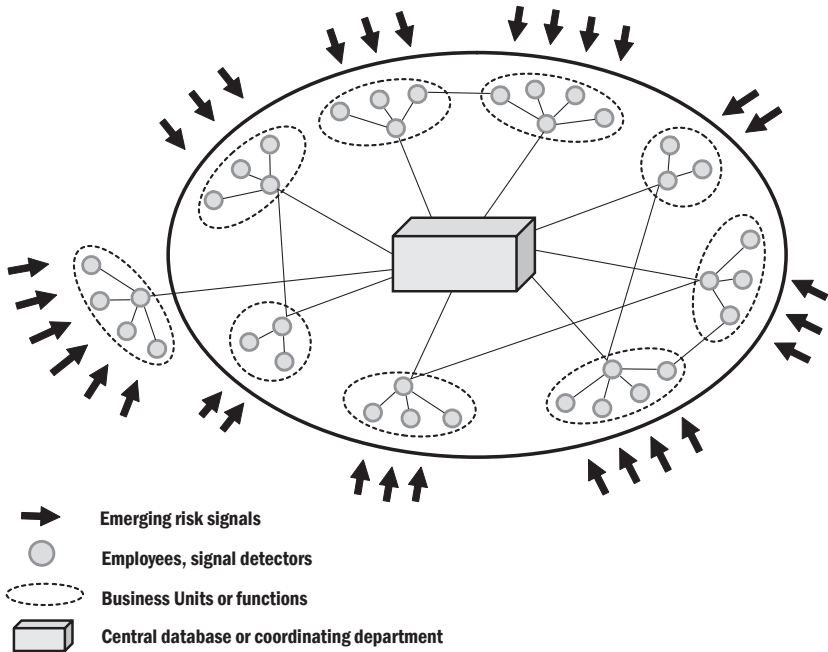


Figure 2: Network-based early-warning system for emerging risks

5.2 Processes of emerging risk management in the insurance industry

Detection and identification of emerging risks

Analysis of the case studies shows very clearly that the identification of emerging risks is based on many inputs from many different sources:

- All the examined firms state that a **broad employee base** is integrated in the process of identifying new risks. These employees are a valuable source of information, as they are generally very experienced in the insurance field and have day-to-day contact with the market and customers, thus putting them on the front line for picking up signals of new risks.
- Some firms deploy **specific groups** for the management of emerging risks, thus centrally coordinating identification activities. The

firm might create an interdisciplinary team for this task consisting of employees from different departments, who, in addition to their “normal” job, are, so to speak, integrated into the group.

- All firms have established specific channels for **involving customers** in the process of identifying emerging risks, e.g., customer feedback possibilities, customer dialog programs, or special events.
- Information regarding future risks is also provided by **industrial bodies** such as the Chief Risk Officer Emerging Risks Initiative.⁹
- It is striking that all firms purchase external knowledge and know-how through **cooperation with external experts**. The extent of this cooperation varies, however.

Analysis of emerging risks

The degree to which insurers are affected by the issues that have been identified varies. Therefore, an assessment of whether the company is likely to be affected by the emerging risk needs to be carried out in an initial **screening process**. The basis of the screening process is often an unevaluated list of all emerging risks.

The companies employ diverse **tools, methods, and aids** in the scientific analysis of emerging risks. Most of the firms examined work with watchlists to which they add all emerging risks to be analyzed. They also constantly update the list with new information. This produces an overview of relevant and less relevant risks. One of the examined firms also links its watchlist to a risk radar, resulting in a graphic representation of all emerging risks.

As the **result of this analytical process**, all the firms create a position paper in which all the information is presented in a condensed form and fully formulated. This paper is usually divided into three parts: a *neutral* section containing scientific background information, a *risk-oriented*

9 This initiative is a good example of an industry-shared early-warning system serving the needs of a number of firms. As part of the initiative, the firms meet periodically and exchange information about newly identified risks, including the presentation of position papers reflecting their current opinions. See <<http://www.croforum.org/emergingisc.ecp>>.

section, setting out firm-specific relevance as well as the impact on the industry more generally, and, finally, a *recommendations* section, which makes proposals for the future handling of the emerging risk and serves as the foundation for further decisionmaking. One company additionally records each emerging risk in a progress database, transparently indicating the status of the risk, previous work done, implemented solutions, and expert opinions solicited.

The process of analyzing emerging risks can be very intensive in terms of time and resources used, and the utility of the end results are often uncertain, as no one knows exactly if, when, or how an emerging risk will become a reality. The risks are thus monitored and reevaluated whenever new facts, reactions, or information become available. In some cases, this may stretch over a period of years or even decades, for example, if a new technology emerges that seems very promising, but for which it is not yet known where and how it will be used, what sort of danger it might give rise to, and so forth. However, the analysis of emerging risks is a crucial step toward understanding the nature of the risk, and possibly crucial for the future of the firm, and much depends on the quality of the analysis.

Evaluation and quantification of emerging risks

It is necessary to separate out those emerging risks that represent the greatest and most damaging impact. The basis for this sorting is careful qualitative and, if possible, quantitative assessment. All the companies examined regard this step as very important, since it is the foundation for further measures. Moreover, it focuses complete attention and all resources on a few individual risks.

The assessment of the company's exposure to an emerging risk is a difficult task that is generally made on the basis of expert knowledge, knowledge of the market, long-term professional experience, and gut feeling. Usually, experts from the departments of underwriting, product development, claims management, the legal department, and risk management are consulted.

With regard to **relevance determination**, a large number of criteria are considered. The following is a list of criteria most often considered in emerging risk assessment.

- Driver of the risk (natural hazards; technological, social, political, or economic developments).
- Type of damage (environmental, personal, assets, financial resources).
- Damage potential (of the individual business units and/or the entire portfolio), cumulative damage potential, serial damage potential.
- Probability of occurrence.
- Latency period of the occurrence.
- Affected lines of business, countries, and insurance classes.
- Demonstrability.
- Coverage aspects.
- Potential to be influenced.
- Awareness of the risk by competitors, customers, and society.

Various filter criteria are used at different levels of the organization. At the business-lines level, insurance criteria tend to be applied, whereas at the company level, both insurance and strategic aspects, such as cumulative damage potential, risk to the firm's financial stability, and robustness of the strategy in light of the emerging risk, are considered.

The companies often illustrate the potential threat of a risk by using graphical, symbolic, or mathematical **tools**. In the mathematical system, a figure is assigned to each evaluation criterion. Adding up the figures produces a sum that in itself is not very informative, but when examined in the context of the whole emerging risk portfolio makes possible an objective comparison. Using a traffic-light system to sort the risks (red, orange, or green) provides a simple, yet effective, guide to the urgency of the emerging risk. Another type of risk assessment consists in listing different concepts and grading them according to their level of severity.

Charting the estimated effect thus creates a profile for each emerging risk, which can be compared with other profiles. Classic risk maps, of the type long used in risk management, are also common. So-called cobweb diagrams, where, for example, six criteria are represented, are also used. The concepts are distributed in the diagram and provided with an axis, resulting in different gradations, with the middle corresponding to a low value and the values increasing toward the edges. The emerging risks are then inserted, together with the related points of intersection, creating a surface that indicates a visible exposure trend.

Operational and strategic measures

Transferring the results from the analysis and evaluation of the emerging risks to the operational divisions, to product development, and to risk management is a major step in managing emerging risks.

In the area of **risk control**, specific measures can be taken at two levels: insurance measures at the business-lines level; portfolio/strategy-oriented measures at the whole-company level. The insurance measures that can be implemented are quite similar across all four of the studied firms, and include the following:

- Adjustment of contractual terms taking into account the new risk situation (higher retentions, lower limits for the risk, limitation of the amounts covered, change of the trigger of “loss occurring” to “claims made,” specific formulations for exclusions).
- Charging additional premiums for taking on the greater risk.
- Offering repurchase possibilities with conditions that better reflect the risk situation.
- Alteration of the target market or target product strategy; in extreme cases, exit from a market or withdrawal of the product.
- Better risk segmentation of customers.
- Sending out newsletters or bulletins to make the policyholders aware of the risk.

- Improving customer risk management.
- Developing and introducing group-wide best-practice applications and underwriting methods so that the risks are better evaluated and quantified and an appropriate price calculated.

Some of the examined companies look at emerging risks in relation to the whole portfolio and the overall strategy of the company. Reinsurers are especially concerned with protecting themselves against cumulative and latent risks. In this respect, all companies emphasize that they want to avoid unpredictable, ruinous cumulative claims. This is why they all believe that cumulative control is one of the important functions in general risk management.

All the companies stress the importance of **product development** in relation to emerging risks. Only two companies, however, systematically link the risks examined to potential market opportunities. These departments have the responsibility to develop and implement products before their competitors do. However, this is far from easy. Rating – a subject emphasized by all four companies – is a major challenge. As no data, no statistics, and only limited experience exist, the exposure rating must be used as the basis for premium calculation. Calculating the necessary reserve capital for emerging risks is also problematic. A further challenge has to do with uncertain market acceptance. If entry into the market with a new set of products (e.g., exclusion of a risk with the simultaneous possibility of repurchase by means of a new product) occurs too early, there is a high probability that the product will not achieve the desired level of market acceptance. Thus, most insurers emphasize that product development aimed at controlling emerging risks will meet with success only if customers and regulatory bodies are involved in the problem-solving process.

In addition to the insurance measures and those taken at the overall-portfolio level, insurers can also counteract emerging risks through the use of **internal information measures** (e.g., policy guidelines for underwriters, underwriting warnings, distribution of position papers), training measures (integration of the emerging risks in training, hold-

ing workshops, presentations at employee events), and consulting and communication measures (e-mail, person-to-personal, publications, a database, an intranet). All these methods educate employees on how to handle these topics on an everyday basis or explain how they can access more information.

Only two of the companies studied have a system for **systematic controlling/reporting** of the measures being taken in regard to emerging risks. In both firms, the market departments keep a record of the measures taken, and the measures are checked regularly and systematically to gauge effects. On the basis of this, the measures are either retained, abolished, tightened up, or watered down. In one company, the emerging risks are also incorporated into the annual risk report, which lays out the risk landscape for the management board.

A crucial component of successfully introducing new products and new risk management measures is **external communication**. In this context, the companies all emphasize that every effort must be made to maintain a dialog with customers, authorities, regulatory agencies, investors, and other stakeholders. Timely communication is essential to maintaining the risk dialog with stakeholders and actively influencing opinion. This is another area where all four companies have the same goal, but approach it from different avenues. The many methods of external communication employed include: publishing in various formats (academic journals, specialist and other magazines, newspapers, the internet, etc.); presentations at seminars, workshops, meetings, or conferences; workshops and bilateral talks on individual emerging risks; interfacing with the media on topics of concern; and lobbying at the national level.

5.3 Information systems to support the management of emerging risks

Various tools are employed in support of the management of emerging risks and the operations undertaken in response to them. There are also systems for the recording, administration, and communication of such risks.

Two of the studied companies use central databases in an effort to simplify the management of emerging risks. In addition to the database,

the firms maintain pages on their intranets that are devoted to emerging risks. These pages primarily serve information and communication functions. Sophisticated technical research tools that automatically browse the internet for information are not broadly employed yet by the insurance companies we studied.

In short, current technology is not being fully exploited yet, and a great deal of reliance is placed on personal networks. Although this is a workable system, to be effective, a network structure is required within the company, and employees need to know who is responsible for dealing with emerging risks.

5.4 Future-oriented risk culture

The organizational culture is of great significance in the context of emerging risks. All the companies examined emphasize that cultural values within the firm are crucial to the successful operation of an early-warning system for emerging risks. One of the most important determining factors here – according to the companies examined – is an open risk culture within the company and accordingly appropriate treatment of stakeholders. All the companies emphasize that risk is their main business and that, therefore, the proactive and farsighted handling of this “raw material” is of great importance. Handling emerging risks in a professional and efficient manner is seen as an integral part of the business, sometimes even to the extent of determining its sustainability.

Another important factor in firmly embedding the early-warning system within the company is that the system must be promoted as being of high importance. In each of the companies studied here, high-level personnel actively promote emerging risks as an important challenge. The involvement of top-level management in the topic is seen as essential by many of our interviewees. In the absence of such high-level interest, the management of emerging risks is relegated to the periphery, which could lead to a dangerous situation.

Despite the active support of top management, the companies have found it difficult to involve the desired (i.e., the maximum) number of employees in the emerging risk process. Financial incentives have failed

at several firms, and these firms are now exploring other incentives in an attempt to involve as many employees as possible in the process. Some methods being tried include encouraging the recognition of employees' diligence by third parties, involving employees in the production of publications, listing productive employees on the intranet, and so forth. There are some employees who participate in the early-warning process simply out of a personal interest. In the case of decision-makers and those employees closely integrated in the emerging risk process, three of the firms have set out concerns about emerging risks as part of a target agreement process, and participants are evaluated on the basis of performance.

To make sure that information about emerging risks is disseminated across the entire organization, the companies regularly hold internal briefings, dispatch e-mails to interested persons, place information on the intranet, and exchange information personally or via internal brochures. Formal and informal networks are believed to be of great importance in this context. However, once again, the four companies display a wide range of behavior in this regard: one of the firms packs as many topics about emerging risk as possible into workshops, meetings, "knowledge fairs", or further training seminars; other companies do nothing of this nature.

The firms' openness toward new topics is made obvious by the way they distribute information externally. All the companies are extremely open in sharing knowledge they have gained about emerging risks. To this end, they send out publications and provide briefings on their own internet pages. Moreover, they regularly participate in stakeholder dialogs, appear at events, and hold workshops, meetings, and conferences. All the companies have their own methods of presenting research results to the public and engaging in the exchange of opinion. And, as previously mentioned, each of the four companies cooperates in various initiatives, and each is a member of the Chief Risk Officer Forum Emerging Risk Initiative.

From the cultural perspective, however, there are still many hurdles to overcome in dealing with emerging risks. Some representatives of

the insurance sector say that their companies are characterized by adoption of a short-to-medium term view of business; long-term issues are not a priority. A similar phenomenon can be found in the case of non-measurables, a category that certainly includes emerging risk. Senior management often has but one question: “What is the monetary benefit?” However, the greatest achievement of a good early-warning management system is the prevention of as many kinds of damage as possible. Unfortunately, phenomena that have *not* happened are very hard to value in monetary terms. This is why some companies cannot even imagine instituting an emerging risk department – such a department does not bring money *in*, it only(!) prevents money from going *out*. A further obstacle to the institution of a successful early-warning system arises from the “silo” way of thinking that takes place in some companies, meaning that they are reluctant, or unable due to the corporate culture, to share knowledge, either between their own departments, or with “outsiders” (i.e., policyholders). This is a case where short-term security measures can result in long-term vulnerability.

6 Conclusions

Emerging risks may have great damage potential, are hard to observe, and are difficult to manage. A proactive handling of such risks is therefore crucial for insurance companies. In this study, we have examined four firms doing business in the insurance sector. Our main focus was on the organization, the process, the supporting systems, and the cultural aspects of handling emerging risks.

The study revealed that in the insurance industry, emerging risks are increasingly viewed as an integral part of the risk landscape. The fact that all four of the examined firms employ dedicated staff for the management of emerging risks is evidence that insurance companies have changed their attitude toward risk management from one of “wait and see” to an actively future-oriented approach.

The operational management of emerging risks offers many challenges. To be successful, insurance companies need to establish an effective early-warning system to detect, monitor, analyze, and evaluate future risks. Reliance on many risk experts, both inside and outside the company, is necessary. However, it is only when the findings are translated into action – risk control, communication, and product development measures – that danger will be avoided. Risk control measures can often be implemented very quickly, and damage can thus be minimized; taking advantage of opportunities revealed by a new risk situation, and thus profiting in a substantial way from the early-warning system, takes a little more time.

When an early-warning system fails, it is often the case that the fault lies not with “hard factors” such as processes, systems, and structures, but with “soft factors” such as behaviors, attitudes, and other cultural aspects. Transforming employees into effective elements of an early-warning system takes time and effort, and it is essential that top-level managers demonstrate in a very tangible way how important such work is. One step in this direction is to integrate emerging risk topics into as many contexts as possible – internal presentations, trainings, workshops, talks, and so forth – until the very concept of emerging risk becomes an integral part of every employee’s functioning. When this occurs, accompanied by appropriate methods of educating and informing stakeholders as well, the company will be viewed as a competent, credible, far-sighted, and caring insurer – all of which can only add to its prosperity.