

# INVESTIGATING THE DEVELOPMENT OF ENTERPRISE RISK MANAGEMENT IN THE INSURANCE INDUSTRY: AN EMPIRICAL STUDY OF FOUR MAJOR EUROPEAN INSURERS

**Madhusudan Acharyya<sup>1</sup>**

**Johnnie Johnson<sup>2</sup>**

## **Abstract**

The objective of this article is to report the results of a study examining the Enterprise Risk Management (hereinafter referred to as “ERM”) practiced by four European-based insurance<sup>3</sup> companies. In particular, the study explores the understanding, evolution, design, and performance of ERM in these organizations and the challenges which they face in implementing ERM. The study concludes that the level of understanding of the nature of ERM varies significantly between companies and between different parts of the same organization. In addition, whilst effective ERM requires an interdisciplinary approach, the ERM which is practiced by the European-based insurers is dominated by a single discipline.

**Key Words:** enterprise risk management, risk communication, risk measurement, interdisciplinary approach, shareholders, stakeholders

## **1. INTRODUCTION**

Enterprise Risk Management (ERM) interests a wide range of professionals including actuaries, financial managers, underwriters, accountants, internal auditors, risk managers, etc. However, current ERM solutions often do not cover all risks because they are motivated by the core professional ethics and principles of those who drive forward ERM systems. In a typical insurance company many professions need to work together to achieve the corporate objectives and they face risk (both financial and non-financial) from multiple sources. These risks affect insurance companies holistically. Consequently, they need to be managed in a holistic manner beyond disciplinary boundaries. A framework of ERM should include such an approach to risk management, which provides a common understanding across a multidisciplinary group of people. However, insurance companies often manage risks in silos, taking little or no holistic view.

---

<sup>1</sup> PhD Candidate in the Centre for Risk Research, School of Management, University of Southampton. He can be reached at M.Acharyya@soton.ac.uk.

<sup>2</sup> Professor of Decision and Risk Analysis, Centre for Risk Research, School of Management, University of Southampton. He can be reached at J.E.Johnson@soton.ac.uk.

<sup>3</sup> Insurance includes both “insurance” and “reinsurance”.

There are no studies that fully investigate the extent to which insurers manage risks in a true holistic manner and this study attempts to fill this gap by exploring the following research questions:

1. What is the understanding of the nature of ERM within the insurance industry?
2. What motivates insurance companies to develop ERM?
3. How do they structure ERM?
4. What challenges do they face in implementing ERM?
5. How do they measure the performance of ERM?

The paper is divided into six sections. Following this introduction, Section 2 describes the data and methodology used in the study. Section 3 briefly explains the traditional approach to managing risks in insurance companies and its connection with their corporate strategies. Secondly, it develops a theoretical conception of ERM based on the existing literature and, finally, various disciplinary perspectives of risk are introduced. Section 4 provides an analysis of the empirical data and attempts to answer the five research questions. This is achieved by first exploring the understanding of ERM identified amongst the staff of the four case study companies (hereinafter referred to as the "CASES"). They include one reinsurer and three primary insurers. Secondly, the driving forces for ERM are identified. Thirdly, a model of ERM, as practiced in the four case study companies, is outlined. Fourthly, the operational and technical challenges faced by the companies in implementing ERM are explored. Fifthly, means of measuring the performance of ERM in the case study companies are identified. Section 5 draws together a number of themes to emerge from the analysis of the empirical data and the literature survey. The issues discussed in this section include:

- The requirement for a broader perspective on risk in order to establish an effective ERM system.
- The merits and demerits of a behavioral perspective on risk, in contrast to the objective perspective employed by many organizations.
- The emerging role of the generalist in ERM.
- The implications of the shareholder value concept for achieving the objectives of ERM.
- The link between insurers' general management functions and their ERM systems.
- The wider role of operational risk within ERM.

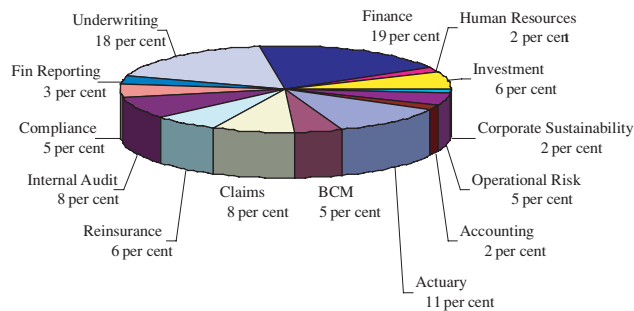
Finally, in Section 6, a brief conclusion is drawn.

## 2. RESEARCH METHODOLOGY AND DATA

The research questions were explored using a case study methodology. Risk management initiatives of four insurance companies (one re-insurer and three primary insurers) were explored. All of them are incorporated in Europe and have a global presence but their identities are not revealed here for reasons of commercial sensitivity. Prior to the collection of data an in-depth literature survey was conducted and a "theoretical framework of ERM", based on this literature review, was developed. The data for the CASES was collected mainly through semi-structured interviews of senior and middle level managers, including chief risk officers, heads of group risk management, financial risk managers, operational risk managers, investment managers, actuaries, underwriters, business continuity managers and internal auditors. Sixty two face-to-face interviews were conducted in various locations throughout Europe and Figure 1 identifies the background of the respondents in the four CASES.

As Figure 1 shows, those with a finance background dominated the respondents' list (19 per cent), followed by those involved in underwriting (18 per cent) and finally actuaries (11 per cent). In addition, the views of a range of industry observers (i.e., leading academics, risk management consultants and rating agency executives) were also sought. Moreover, the notes taken by the researcher when attending

**Figure 1**  
**Disciplinary background of respondents**



various risk management and insurance conferences/seminars both in Europe and in the U.S. in recent years provided valuable ideas to help in the analysis of data and in developing conclusions.

The data was coded by NVivo (qualitative software) and analyzed by comparing and contrasting the various respondents' views and relating them to relevant literature. However, the analysis of primary data was complicated by a wide range of conflicting opinions and the interviews could not fully cover all relevant topics with each individual respondent. Inconsistent coverage of issues between interviews made the analysis difficult. Consequently, in order to develop a comprehensive, consistent database a highly structured questionnaire was administered to the respondents of two cases. Most of the responses to the questionnaires for the other two cases were completed by the researcher using judgments based on the respective interview transcripts. This was necessary due to the low response rate from these cases. The questionnaire involved a series of Yes or No answers. The questionnaire results and individual respondents' interview data were combined to develop individual reports for the CASES. The results of the individual CASES were then compared in order to address the research questions relating to the: (i) understanding, (ii) motivation, (iii) structure, (iv) challenges in implementation, and (v) performance of ERM. The analysis results in a framework of ERM as practiced across the CASES. This is compared with the "theoretical framework of ERM" developed from the literature.

### 3. RISK MANAGEMENT IN INSURANCE COMPANIES

#### 3.1 Traditional Risk Management in Insurance Companies

Insurance, as device for treating risk, can be examined from both quantitative and qualitative standpoints. Insurance provides value to both economy and society.<sup>4</sup> Insurance companies in essence accept clients' unwanted risks, but if they do not have efficient mechanisms to manage these risks they are unlikely to be profitable or even to remain in business. However, many insurance companies have been in business for a long time and have been serving the business community and society. This suggests that they have some established and tested mechanisms to manage those risks in order to produce profit and meet the expectations of their stakeholders. The question becomes what mechanism do they use, and is that traditional mechanism obsolete?

The real source of the portfolio of risk of an insurance company is a set of insurance policies. These policies are individually risky but their combined losses are fairly predictable using actuarial techniques, such as the mechanism of diversification, the law of large numbers and placing some risks with other risk carriers (co-insurance, reinsurance, securitization, etc<sup>5</sup>).

<sup>4</sup> Diacon et al. (2005); Skipper (2005).

<sup>5</sup> Mehr & Hedges (1974).

Financial institutions have four common corporate objectives: profitability, social responsibility, growth and solvency.<sup>6</sup> From the financial point of view, the maximization of shareholder value is directly linked to profitability.<sup>7</sup> However, accounting variables (e.g., earnings per share, rate of return from risky investments, etc.) do not attract the attention of shareholders unless they clearly impact the profit stream in the long term.<sup>8</sup> Indeed the long term profit is linked to the organization's economic prospects; these are not limited to financial figures, but importantly include the trusteeship between various social settings. Thus social responsibility is increasingly an important element of sustainable value creation for financial companies including insurance companies.<sup>9</sup> Growth is, to some extent, related to shareholder value, but solvency is a result of managerial preferences in terms of their ability to pay the claims of policyholders. However, from a risk management perspective one of the key objectives is maintaining solvency, which means ensuring the businesses' continued existence even in the event of surprises; and the ultimate objective of risk management is to reduce loss due to potential surprises.<sup>10</sup>

All the above suggests that achieving corporate objectives in insurance companies requires a joint initiative from both Financial Risk Management and Strategic Management.<sup>11</sup> However, as indicated later, the study finds that most risk management in insurance companies is tackled from a financial perspective. However, in treating and analyzing risk, the financial approach does not consider individuals' preferences and behavioral reactions to risk. The psychological and social approaches do utilize such behavioral aspects in analyzing risks, and, consequently, they provide important insights in examining the (theoretical) framework of ERM as expounded in the literature.

### 3.2 Theoretical Conception of ERM

The literature suggests an interdisciplinary framework of ERM, which involves both quantitative (objective) and qualitative (subjective) perspectives. Traditionally, risks in insurance companies are managed in departmental silos. While pure risk (downside risk) is the key concern of the underwriting, reinsurance and claims departments, speculative risks (associated with downside and upside risk) are of interest to the finance, treasury and investment departments. Objectivity is the main tool of technical managers (e.g., risk modelling, risk measurement, risk appetite, etc.) but subjectivity affects operational managers in the face of uncertainty. So at a theoretical level both the generalist and the specialist within the organization are exposed to risk in their functions, thus suggesting the need for a common or mutually acceptable ERM framework. Consequently, the theoretical definition of ERM (i.e., that derived from the literature) would be "management of all risks in a holistic framework". The key word in this definition is 'all risk', which stands for all insurance, financial, operational, strategic, hazard risk, etc. It thus embraces all risk from whatever source. Clearly, no individual discipline could develop such a holistic view of risk because each discipline perceives risk from a specific perspective.

### 3.3 An Interdisciplinary Perspective on Risk

All branches of mathematics view risk as an objective phenomenon which is quantifiable and risk related work in mathematics is generally initiated to achieve one or more specific target(s) and follows a very clear methodology (e.g., mathematical formula) based on certain assumptions or parameters. In contrast to this deterministic approach, all the branches of the social sciences (e.g., psychology, sociology, anthropology, economics etc.) perceive risk as a subjective phenomenon (state of mind) which may not be accurately quantifiable. Scholars who subscribe to this subjective approach argue that if the

---

<sup>6</sup> Mehr & Forbes (1973).

<sup>7</sup> Davenport & Bradley (2000); Dickinson (2001); Dickinson (2005); Lam (2003).

<sup>8</sup> Rottman (1971).

<sup>9</sup> Van den Berghe & Louche (2005); Cochran & Wood (1984); Heal (2005); McGuire et al. (1988); Wade (2003).

<sup>10</sup> Athearn (1971); Gahin (1971).

<sup>11</sup> Dickinson (1997); Miller (1992).

future is either predetermined or independent of present human activities then the term risk does not make any sense.<sup>12</sup> From this perspective the understanding of risk is fluid and, consequently, most of the work on risk in the social sciences does not target any rigid objective.<sup>13</sup> Consequently, a broader picture of risk emerges in the social sciences than that focused on by many mathematicians. However, there are differences in the subjective views of risk, even within the social sciences. Risk in the field of psychology is viewed as a behavioral and cognitive phenomenon.<sup>14</sup> In sociology, risk is viewed as a societal phenomenon.<sup>15</sup> However, in both psychology and sociology trust is considered to be an area of major significance in understanding risk perceptions and responses,<sup>16</sup> thus maintaining a relationship with emotions.<sup>17</sup> In anthropology, risk is viewed as a cultural phenomenon.<sup>18</sup> In economics, risk is a decisional phenomenon and a means of either securing wealth or avoiding loss or both.<sup>19</sup> The economic concept of risk, although based on subjective utility, is the closest to the mathematical (technical) approach.<sup>20</sup>

The conclusion which emerges from the analysis is that social scientists tend to analyze risks within a broader boundary than do mathematicians. In addition, whilst mathematicians may focus on a single goal in risk management, social actions to cope with risk include a range of objectives such as equity, fairness, flexibility and reliance.<sup>21</sup>

At the practitioner level risk is viewed from both perspectives in different functions of an insurance company.<sup>22</sup> In reality, the work of finance staff, actuaries, underwriters or investment managers include both mathematical and social science elements and trust, emotion, and attitudes play a vital role in all situations associated with achieving financial targets.

In summary, a theoretical conception of ERM considers all risks irrespective of the nature, source and size. In addition, due to risk's multi-faceted nature, an interdisciplinary team within the organizational structure is necessary to deal with the issues included in the theoretical framework.

#### 4. ENTERPRISE RISK MANAGEMENT AS PRACTICED IN THE CASES

This section analyzes the results of the empirical study in relation to each of the research questions identified above.

##### 4.1 Understanding of ERM

Analysis of the interview transcripts revealed four key concepts associated with ERM in the minds of individual members of staff of the CASES: harmonization, standardization, integration, and centralization. A narrow definition of harmonization relates to increased coordination and streamlining of the activities of different business groups. However, three underlying ideas help to conceptualize harmonization. Firstly, a common approach to planning, managing and delivering risk; secondly, bringing a balance amongst the existing tools and policies, and finally, sharing information to promote transparency and better coordination. Standardization, which is close to the concept of harmonization,

<sup>12</sup> Renn (1992).

<sup>13</sup> Zinn (2006).

<sup>14</sup> Althaus (2005); Slovic (1972); Slovic et al. (2004); Taylor-Gooby & Zinn (2006).

<sup>15</sup> Renn (2004); Taylor-Gooby & Zinn (2006); Zinn (2004b, 2006).

<sup>16</sup> Taylor-Gooby & Zinn (2006).

<sup>17</sup> Barbalet (2005).

<sup>18</sup> Masuda & Garvin (2006).

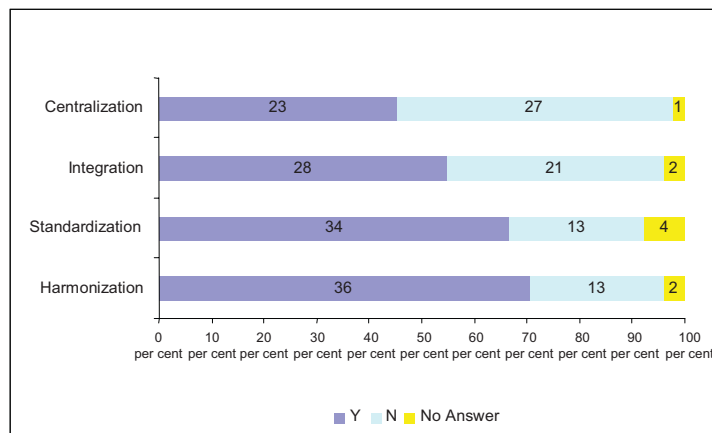
<sup>19</sup> Althaus (2005); Haynes (1895); Zinn (2004a).

<sup>20</sup> Renn (1992).

<sup>21</sup> Short (1984).

<sup>22</sup> Skipper (2005).

**Figure 2**  
**Understanding of ERM**



is seen as a technique for documenting, reviewing, and approving unique definitions, characteristics, and representations of data according to some established procedures and conventions. The conceptual foundation of integration includes the aggregation of different parts to a holistic framework. Clearly, the approach of integration involves both horizontal (across a layer of the organization) and vertical (between layers of the organization) aspects, whereas harmonization and standardization involve mostly a horizontal perspective. Finally, centralization is conceived as an act of consolidating decision-making power under central control.

Clearly, the theoretical framework for ERM suggested by the literature is most closely associated with the concept of integration. However, the questionnaire survey undertaken in the CASES revealed that staff perceived ERM rather differently.

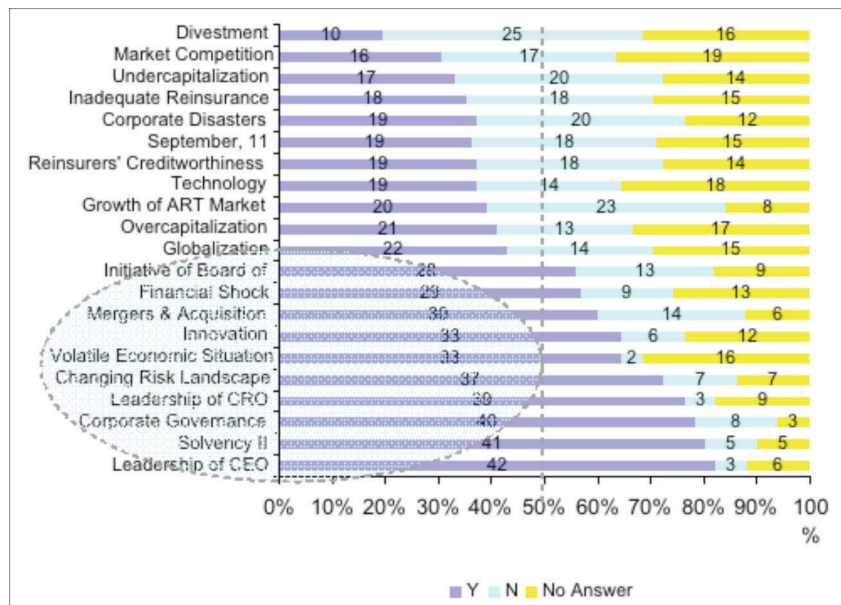
Figure 2 indicates that 36 (70 per cent) out of 51 respondents in the questionnaire survey believe that ERM is most closely associated with harmonization, 34 respondents (67 per cent) believe ERM is associated with standardization, 28 respondents (55 per cent) believe that it is associated with integration and 23 respondents (45 per cent) believe it is associated with centralization. The interview survey also identified a close relationship, in the staff's minds, between standardization and harmonization, although a striking feature of the interviews was that there is no common terminology in the understanding of ERM across disciplines. However, it is clear that any structured scientific approach towards identifying, evaluating and managing risks requires standardization. Only a common language can allow a comparison of scientific knowledge across the organization; and a common language can only be obtained through a meaningful dialogue (communication) among the stakeholders in identifying, analyzing and quantifying risks in order to avoid surprises. In the aggregated approach, the focus is on 'macro' relationships rather than on individual risk elements or individual management decisions.<sup>23</sup>

The study suggests that ERM does not emerge in organizations in a consistent pattern. For example, while one case started with ERM based on centralization, another started with ERM based on integration. It also appears that ERM is a multi-layered process, and the understanding of what it represents differs at different levels of management. For example, when ERM is regarded as centralization, each manager is seen as responsible for the risks s/he takes (i.e., risk owner) with senior management overseeing the process.<sup>24</sup> To achieve this objective, part of the ERM process involves developing

<sup>23</sup> Long et al. (1962).

<sup>24</sup> Dickinson (2001).

**Figure 3**  
**Driving forces of ERM**



a vocabulary (a common language) so that people across the organization can understand risk in the same way across different disciplines.<sup>25</sup> This introduces the need for standardization. However, senior management has a coordinating role in bringing together a harmonized or aligned framework, offsetting the duplication of risk management policies and arrangements through modifications and alterations. Integration involves consolidating all three layers (centralization, harmonization and standardization). While harmonization and standardization operate horizontally across a layer of the organization, in terms of organizational policies and resources, centralization operates vertically to control the entire ERM process. From this perspective, ERM can be defined as a four-layered process in terms of harmonization, standardization and integration and centralization.

**4.2 Motivation for ERM**

Figure 3 indicates the key driving forces for ERM as perceived by the respondents in the questionnaire survey.<sup>26</sup> It shows that 42 (82 per cent) of the respondents identified leadership of the CEO as the main driving force followed by Solvency II (proposed solvency regulation for member countries of the European Union: 41 respondents (80 per cent)) and Corporate Governance (40 respondents (78 per cent)). Leadership of the CRO and the changing risk landscape were also been identified as key driving forces by over 76 per cent of respondents. The key driving forces are now discussed in turn.

*Regulations*

Regulations primarily influence the behavior of organizations through the exercise of state power<sup>27</sup> and stability of the insurance market is a primary concern of insurance regulators.<sup>28</sup> Traditionally, insurance

<sup>25</sup> Verbrugge (2003).

<sup>26</sup> The numerical figures in the graph represent the number of respondents who indicated that the “leadership of the CEO” (for example) is a driving force for ERM (or not). Here, 42 respondents indicated it was a driving force (Y), 3 indicated it was not (N) and 6 respondents did not answer (No answer).

<sup>27</sup> Otway (1992).

<sup>28</sup> Mathur (2001); Ross (2001).

legislation is focused on managing and reducing risks arising from insurance and investment operations. The interview survey found that determining the amount of capital which is adequate to finance its total acceptable risks from economic perspective is of central concern to all questions relevant to insurers' risks. However, the research finds that management failure is the key reason for insolvency of insurers, suggesting that, to some extent, no amount of capital is adequate in the hands of inefficient management.<sup>29</sup> All these arguments identify internal control and management methods as significant elements of ERM<sup>30</sup> despite the worry of internal auditors about maintaining independency from management functions. Consequently, regulations, in terms of ensuring solvency through risk and capital management and appropriate corporate governance, are seen as the key driver towards ERM in the insurance industry.

#### *Leadership of The CEO*

Although leadership of the CEO is identified by the questionnaire survey as one of the key driving forces of ERM, the analysis of interviews suggests that two key factors (i.e. regulations and the volatile economic situation) motivated CEOs to adopt ERM. This arose because the rate of increase of uncertainty in operating the businesses has been much greater than the increase of risk management expertise in the CASES. Consequently, CEOs need to gear up the risk management in a holistic manner and to encourage other employees to follow the initiative.

In summary, regulations in terms of solvency and corporate governance are found to be key driving forces for ERM in the insurance industry. Moreover, leadership of the CEO and also the CRO (to some extent) have added further momentum to introducing and shaping ERM according to the needs of their enterprises. In today's fast changing, turbulent environment it is very important to see the big picture. In fact, it is particularly difficult to manage companies in such environments when they become very large. This requires a balanced, interdisciplinary team and a balanced portfolio of risk. Without a holistic view it is impossible to see either the big picture or the ideal shape of a balanced team.

### **4.3 The Design of ERM**

Figure 4 illustrates the key components of the ERM model and their interrelations as applied in the CASES. This emerged from analysis of the interviews conducted in the CASES.

#### *Description of The Model*

The theoretical framework of ERM indicated by the literature suggests that ERM should consider all risks. However, the CASES in practice filter these 'all risks' using an imaginary Radar Screen 1 (as seen in Figure 4). Consequently, they only capture a subset of numerically quantifiable risks, in terms of a predetermined probability of failure over a certain period of time. A subset of large risks (mostly non-quantifiable), including emergent risks (which are best described as the unknown of known risks), are not considered until the next stage of ERM.

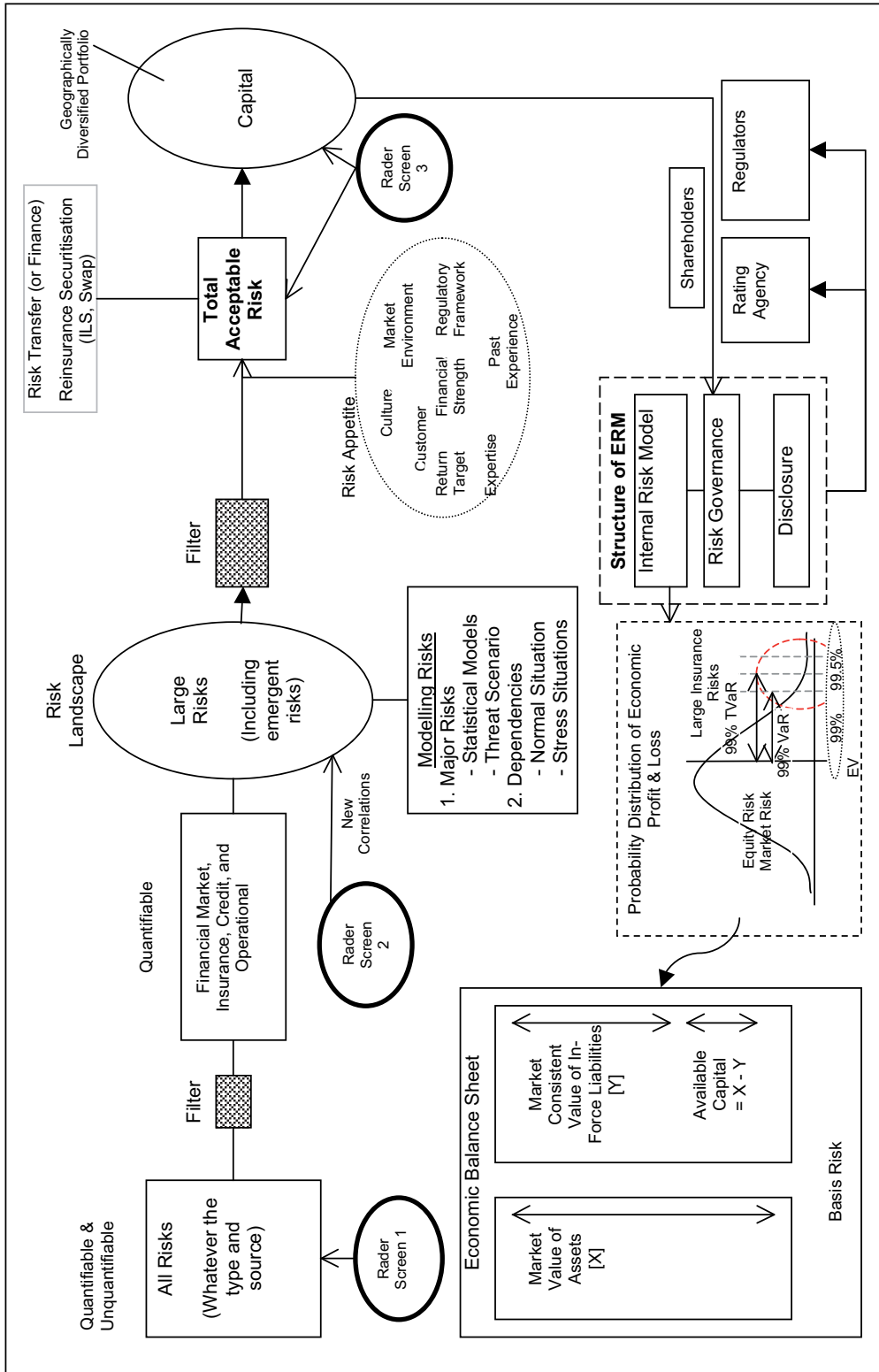
Another Radar Screen (2) operates continuously with the portfolio of quantifiable risks to calculate their potential frequency and severity using various statistical techniques. However, the volatility and dependency among them always remains a key concern. The following stage uses another filter to calculate total acceptable risks, which is linked to the risk appetite of the firm. In fact, the risk appetite is a complex issue as it includes many qualitative factors like organizational culture, customers' preference, market environment, etc. The total acceptable risks are very specific to the firm and are difficult to quantify numerically. The CASES exhibit inconsistent risk preferences. Various techniques, including both the capital and

<sup>29</sup> Simon et al. (2003).

<sup>30</sup> Hutter & Power (2001); Kleffner et al. (2003); Power (2005b); Selim & McNamee (1999).



**Figure 4**  
**A composite model of ERM employed by the CASES**



money markets are used to transfer and finance the total acceptable risk. A variable amount of capital is then deployed to finance these risks. These actions indicate that the cases deal with risks by first calculating and then choosing among the available and alternative risk-return combinations.<sup>31</sup> A third Radar Screen (3) comes into operation at this stage to observe the changes in the total acceptable risks, and this is then employed to adjust the amount of capital, commonly known as economic capital.<sup>32</sup> Modelling of economic capital is linked to the first pillar of the structure of ERM. The first pillar deals with the internal risk model. It includes a calculation of economic capital in terms of total acceptable risks. The second pillar includes internal control, in terms of corporate governance issues, as a process of risk reduction. The third pillar deals with the transparency of disclosure to stakeholders, in particular, regulators, rating agencies, and shareholders. The dynamic relationship between total acceptable risk and the economic capital results in an economic balance sheet. This hypothetical balance sheet provides updated information to the stakeholders about the strength of the organization, both in financial and operational terms.

All the above discussion suggests that the CASES are employing their ERM models to control risks using certain assumptions, rather than managing risk through the full utilization of resources and knowledge. The model introduces some filters (or switch-gates) built on strict parameters, which obstruct the natural flow of knowledge within the organization. Therefore, the more focus the ERM model gives towards exploiting opportunities through quantification of risk the less emphasis it has to protect the organization from intangible losses.<sup>33</sup> The model encourages the organization to take more risk without justifying the full consequences other than the financial implications and, consequently, it is unclear if the model is sufficiently capable of protecting the survival or promoting the growth of the firm.

#### *Limitations of The ERM Model Employed by The CASES*

Models can never represent the entire reality as they are based on many assumptions. The study identifies several weaknesses of the models employed by the CASES. Firstly, they ignore unquantifiable risks because of a lack of expertise in understanding or being able to handle these risk taking situations. Even within the range of quantifiable risks, the models only include large risks. Secondly, the evaluation of risk appetite presents a major concern because it excludes most subjective issues (e.g., culture, customer attitudes, trust, limitations of expertise) in calculating the total acceptable risks (risk tolerance level). Thirdly, the interests of a major group of stakeholders (i.e., managers and staff) are not considered (e.g., incentive schemes for prudent risk taking are not employed). Finally, much emphasis is given to the internal risk model rather than the risk governance framework and disclosure policy, including the establishment of an integrated model to combine these three factors (i.e., internal risk model, risk governance, and disclosure). Moreover, the model does not provide sufficient scope for incorporating cultural values in designing risk management policies and procedures. Consequently, the model employed by the CASES by no means fits with the theoretical framework of ERM suggested by the literature.

#### **4.4 Challenges in Implementing ERM**

The first part of this subsection discusses the operational challenges and the second part the technical challenges faced by the CASES in implementing ERM (as seen by the respondents).

##### *Operational Challenges*

The questionnaire survey results are summarized in Figure 5 and these show that risk communication (in the absence of a common risk language and a common risk culture) is identified as the key operational challenge by 42 of the 52 respondents (81 per cent). This is followed by risk awareness amongst middle level staff and risk communication between different disciplines; both of these were

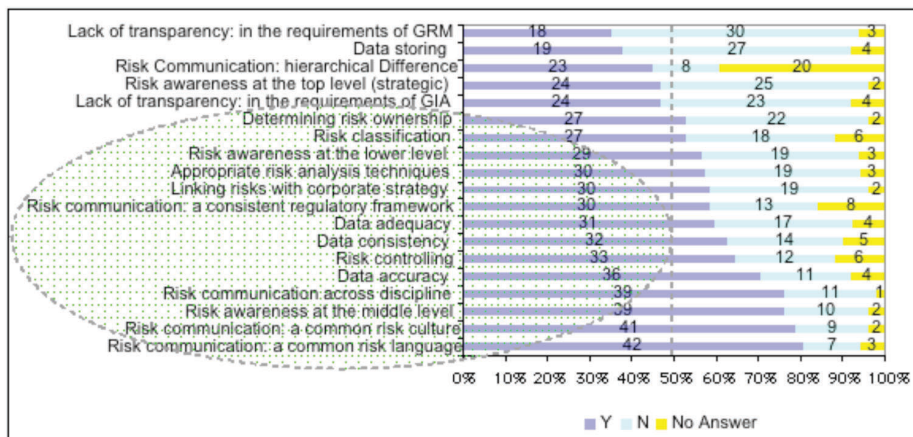
---

<sup>31</sup> March & Shapira (1987).

<sup>32</sup> Barfield & Palmer (2002); Belmont (2004).

<sup>33</sup> Hogg (2005).

**Figure 5**  
**Operational challenges in implementing ERM**



supported by 39 respondents (75 per cent). Accuracy, consistency and inadequacy of data were also identified as key challenges.

Communication is often a challenge associated with an emerging topic.<sup>34</sup> The analysis suggests that lack of understanding is a major obstacle; risk communication must be improved and conflict overcome in order for the goals of ERM to be achieved.<sup>35</sup> However, risk communication is not an isolated issue. It is essentially linked to the attitude of individuals towards risk and is subsequently linked to culture.<sup>36</sup> Moreover, all these issues are linked to the motivation of achieving risk management goals.<sup>37</sup> Furthermore, an effective risk communication system can introduce a culture of choosing good risks and rejecting bad risks at every level of the organization.<sup>38</sup>

Data was also found to be a key operational challenge. The main issue identified in the CASES regarding data is not so much with the financial variables themselves but in communicating the appropriate meaning of the variables to different staff involved in the ERM process. Nevertheless, effective communication goes beyond the boundary of providing information and involves sustainable relationships among individuals, where mutual trust and respect are essential.<sup>39</sup> In investigating the barriers to effective communication, the study discovers two important factors (i.e., individual perception and preference for risk). Additionally, the study identifies culture as a broader issue, having a close relationship with perceiving and selecting risks, choosing objectives from various alternatives, and rational decision making. However, these aspects are very specific to each organization. Nevertheless, understanding appears to be a key problem for implementing ERM. Although the literature suggests that ERM involves managing all risks, to finance staff ‘all risks’ appears to mean all financial risks (e.g., fluctuation of asset values, foreign exchange, credit risk, etc.); for insurance staff ‘all risks’ means a combination of underwriting, pricing, reinsurance, reserving, and claims risks. The study discovered a serious misunderstanding of the meaning of ‘all risks’ among staff from different disciplines. Therefore, risk communication, culture, and awareness need to be aligned through a common risk language to develop an efficient ERM system.

<sup>34</sup> Nielson et al. (2005).

<sup>35</sup> Kloman (1992).

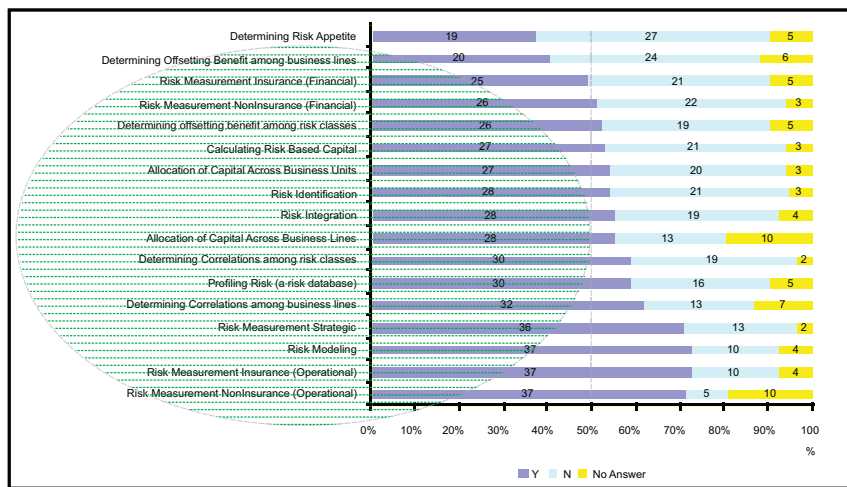
<sup>36</sup> Douglas & Wildavsky (1982); Rippl (2002); Skipper & Skipper (2001); Tansey (2004).

<sup>37</sup> Drew et al. (2006); O’Hara (2006); Osterloh & Frey (2000).

<sup>38</sup> Masuda & Garvin (2006).

<sup>39</sup> Otway (1992).

**Figure 6**  
**Technical challenges in implementing ERM**



*Technical Challenges*

The questionnaire survey results (summarized in Figure 6) indicate that measurement of operational risks and modelling of risk are the key challenges perceived by 37 (71 per cent) of the 52 respondents. Measurement of strategic risk is identified as another key technical challenge (by 69 per cent of the respondents). Furthermore, calculating correlations among business lines (62 per cent) and profiling risks and calculating correlations among risk classes (58 per cent) are also identified as important technical challenges in implementing ERM.

The challenge of measuring risks involves estimation of the probabilities of an outcome and this is difficult because of ignorance associated with the subjectivity attached to the events. However, the main concern detected from the interview survey is the calculation of economic capital while absorbing diversification benefits. This is a particularly significant issue for reinsurers as their businesses, by nature, are geographically diversified whereas the retail insurers secure diversification through large volume.

**4.5 Performance of ERM**

Although the performance of the ERM system is an important question, it has been given relatively little attention by CASES. It is evident that some key risk indicators, both in accounting and economic terms (Key Performance Indicators (KPI)), are ultimately linked to value creation and these are used by the CASES to illustrate the performance of ERM. There are three major value drivers of the insurance business: production, investment and reinsurance.<sup>40</sup> One important consideration is that value is primarily determined by economic factors and not accounting cash flows.<sup>41</sup> Clearly, such a deterministic approach to measuring the performance of ERM is risky for two primary reasons. Firstly, it ignores all soft initiatives and efforts of team members simply because they are not measurable in terms of financial figures. For example, calculating the amount of risk focuses on the frequency and severity, and this ignores numerous factors, such as organizational issues like cultural change. Secondly, there is a possibility of losing good corporate customers who believe in long term value (i.e., reputation). However, there could be an excuse for this approach on the grounds that a major part of premium comes from retail business. However, it should be remembered that in the case of failure to achieve predetermined

<sup>40</sup> Calandro & Lane (2002).

<sup>41</sup> Rogers (2002).

targets, the attitude of the retail customers is likely to change instantly, because they do not have the capability (or even intention) of looking for long-term value. If their confidence is lost (e.g., a loss of reputation) it would be very difficult to restore. However, true value (discounted cash flows) cannot be short term.<sup>42</sup> Successful implementation of ERM can introduce a culture of prompt detection of opportunities simultaneously with detection of the risk of bad outcomes.

Another issue relating to the performance of ERM involves two interrelated questions: what are the key goals of ERM and how could they be achieved? Theoretically, the ultimate goal of ERM is to help management in achieving corporate objectives.<sup>43</sup> The study suggests that if the objective is to increase only the shareholder value, then KPIs probably help to illustrate the added value in a tangible form. Nevertheless, the dilemma of value creation still remains. This is an intangible issue. The problems of measuring the performance of ERM are similar to the problems of measuring the performance of research and development (R&D). It is generally believed that risk management creates opportunities for R&D and that R&D develops new products, prices, and knowledge, and these are very difficult to cost or value. However, one key success factor is establishing a culture of facilitating a two way dialogue among the internal parties and even to some extent extending such dialogue to external parties.

In summary, the performance of ERM needs to be justified in terms of (i) how broad, deep, and resilient in terms of shared understanding the risk management culture is; (ii) how strong or efficient the two-way dialogue is (i.e., communication); and finally in terms of (iii) the nature of the organized and coordinated actions. These factors should all serve to break down disciplinary barriers.<sup>44</sup>

## 5. DISCUSSION: EMERGING THEMES FOR ERM

This section generalizes some of the issues which emerged from the above analysis, relates them to relevant literature and establishes a set of important themes associated with the development of ERM in the insurance industry.

### 5.1 A Broader Perspective of Risk

For the purpose of effective risk decision making it is important to acquire knowledge relating to (i) the nature of risk (ii) the relationship of risk to management and (iii) the ways of treating risk in an enterprise system.<sup>45</sup> Most of the people interviewed were very conscious of the treatment of risk in relation to a specific business line or segments but lacked the knowledge of the other two aspects. The primary emphasis in the CASES appears to be to use corporate finance as a device for the treatment of risk. Little attention is given to risk in a more abstract fashion. Attention is usually centered on various types of financial risks, specifically in terms of numerical figures. The strength of such a treatment of risk lies in the attention given to the range of financial risks related to the lines of business, associated with return maximization. Such an approach seems to manage corporate financial risks as core business risks and ignores other ancillary risks. In fact, the ignored risks still remain in the business and there may be a danger of paying insufficient attention to risk as a complicating factor in individual and organizational decision making. It is important to realize that any subject is better understood when it is related closely to the total complex of subjects of which it is a part. In such circumstances, effort might be made to resolve the nature and significance of risk in terms of its philosophical, psychological, and other behavioral restrictions. All these arguments indicate that the current approach in the CASES of treating risk within the narrow focus of a risk and return dichotomy is not sufficiently broad. In essence,

---

<sup>42</sup> Copeland et al. (2000).

<sup>43</sup> Dickinson (2001).

<sup>44</sup> Power (2004a).

<sup>45</sup> Long et al. (1962).

risk treatment should be considered not only in terms of devices but also in terms of relationships to economics, marketing, mathematics, finance, legal doctrines. In analyzing risks, managers in the CASES classify risks but they do not sufficiently explore them in relation to the related phenomena, thus neglecting both the ignorance and preferences of individual managers in terms of risk related decision making. Mobilizing such behavioral elements of risk could lead to a better allocation of their huge resources—including capital—while introducing an efficient knowledge sharing culture throughout the organization. Another important issue relates to the ownership of risks. The key question here is who is responsible for what risk. In this respect it would also be important to link such accountability with the measurement of individuals' performance and with the performance of ERM.

## 5.2 Behavioral phenomena associated with risk management

As indicated above, the survey suggests that economic and financial principles are not enough to solve all challenges of ERM. It is clear from the study that risk taking and management involves emotions such as anxiety, fear, stimulation and joy.<sup>46</sup> Importantly, psychology should be considered jointly with economics and financial aspects of risk.<sup>47</sup> Although managers take risks and exhibit risk preferences, the practical models of ERM, as observed in the CASES, do not recognize this. Each risk perspective is a subset of a large and complex field of uncertainty<sup>48</sup> and this prevents decision makers from seeing the big picture.<sup>49</sup> One of the roles of ERM should be to provide this larger picture.

## 5.3 Specialist versus Generalist

The interview survey in the CASES discovered the distinction between the specialist and the generalist as a key issue in promoting ERM. The key criticism is that specialists (e.g., actuaries, financial managers, etc.) are often blinded by the perceived wisdom of their discipline and fail to realize the benefits of a broader perspective. Moreover, specialists tend to be overconfident and rigid in their views even when dealing with conflicting opinions from specialists in other disciplines.<sup>50</sup> Consequently, one of the many demerits of such a one sighted view is that it may not consider subjective risks if it focuses on objective risk. Traditionally, financial specialists and actuaries tend to solve problems based on their professional background, principles, and training. However, specialists placed in the position of CRO are compelled to see the broader picture of risk which is often beyond their professional boundaries.<sup>51</sup> For instance, actuaries who are expert in working with historical data are often unaware of the principles of other subjects such as organizational behavior. However, ERM should integrate financial risks with operational and strategic risks. Fortunately, there is evidence that individual professions are beginning to realize their limitations.<sup>52</sup> The study identifies that effective communication across disciplines is the core requirement to dealing with a wider community of stakeholders when implementing ERM.<sup>53</sup> All these arguments suggest the need for a person, or a group of people, who can see the holistic picture of risk within and outside of the organization. Unfortunately, often only one person has such an opportunity, and that is the CEO; this is why the CEO is the ultimate CRO. Consequently, the CRO in effect represents the CEO within the management hierarchy to look after risk and its holistic management. Such responsibilities establish the ideal CRO as a strategist having knowledge of all risks, irrespective of source and type.<sup>54</sup>

Essentially, the educational system in universities and professional institutes is built on silos like finance, actuarial science, organizational behavior, etc., and there is little scope to produce such a

<sup>46</sup> March & Shapira (1987).

<sup>47</sup> Shanteau (2000).

<sup>48</sup> Kloman (2003); Ward & Chapman (2003).

<sup>49</sup> Slovic et al. (2004).

<sup>50</sup> Otway (1992).

<sup>51</sup> Dickinson (2001); Dickinson (2005); Liebenberg & Hoyt (2003).

<sup>52</sup> James (1968); Wang (2004).

<sup>53</sup> Nielson et al. (2005).

<sup>54</sup> Hood (1996); Power (2005a).

multidimensional person with interdisciplinary knowledge. Essentially, the CRO (either a person or a unit) must deal with a body of interdisciplinary knowledge. Practically, many of the problems faced by the CRO are not technical, but procedural, involving communications, coordination and control.<sup>55</sup> Therefore the role of a CRO is closely related to each layer of ERM (i.e., harmonization, standardization, integration, and centralization) as discussed earlier. However, the current practice in the CASES does not support this approach. Rather, the CASES appear to employ a silo type risk management and try to practice ERM within the broader scope of a specific disciplinary silo. In summary, risk management academics have ignored the literature of management, but the literature of management has ignored risk management.<sup>56</sup> In fact, the various disciplines, while contributing on ERM, bring their own silo-type histories and believe themselves to be the most important perspective. Consequently, they each attempt to take control.<sup>57</sup> As a result, communication between the generalist and specialists does not enable them to connect effectively with, or to alter, each other's opinions.<sup>58</sup> However, the study suggests that CROs should have an interdisciplinary background and they should reflect a broad body of knowledge.<sup>59</sup> This requires the active support of a group of interdisciplinary staff. To achieve this objective, there is a growing argument among the respondents of the survey to merge the role of the CRO with the Group Risk Committee, on which is represented key staff from different departments (and, hopefully, disciplines) of the organization.

#### 5.4 Shareholder Value Versus Stakeholders' Interest

The study revealed that maximization of shareholder value (in line with enterprise value: the discounted value of net cash flow) coupled with maintaining liquidity and solvency is the primary goal of ERM in the CASES. If the ERM model is built on the framework of corporate risk management which suggests that shareholders (in their capacity as owners) are only providers of capital, this should ensure that the maximum sustainable return is the primary function of ERM. From a corporate finance perspective, risk management is central to creating shareholder value. This is because risk information, based on economic capital, is a required input for accurate capital budgeting, capital structuring, capital allocation, and risk adjusted performance calculations.<sup>60</sup> Within this perception, the satisfaction of policyholders is maintained simply in terms of the fulfillment of contractual obligations. Further, it involves ensuring a certain minimal level of cash flow to preserve the targeted credit rating. However, such a narrow focus on shareholder value under ERM is questionable when the objective is to serve a broader group of stakeholders.

The current economic situation has led to shareholders' faith in organizations to be progressively weakened by corporate crises and scandals, and it is now generally agreed that the generation of economic value is a necessary, but not a sole element for running a business.<sup>61</sup> In addition it is observed that although the risk management efforts of the CASES are based on the Modern Finance Theory they principally oppose the Modigliani and Miller irrelevance propositions, which assume that a company's initiative in risk management is not a value adding function.<sup>62</sup> This tension is given some relief from the finance literature, since it indicates that increasing shareholder value does not conflict with the long term interest of other stakeholders.<sup>63</sup> However, a further area of conflict arises from corporate finance: namely, one concept focuses on the capital market through financial economists' theories based on efficient market assumptions<sup>64</sup> whereas another focuses on corporate social responsibility through stakeholder theory based on culture and ethics.<sup>65</sup>

<sup>55</sup> Aabo et al. (2005); Denenberg & Ferrari (1966); Lee & Shimpi (2005); Power (2005a); Stahel (2005).

<sup>56</sup> Denenberg & Ferrari (1966).

<sup>57</sup> Kloman (1992).

<sup>58</sup> Skipper (2005).

<sup>59</sup> Ward (2001).

<sup>60</sup> Belmont (2004).

<sup>61</sup> Marsiglia & Falautano (2005).

<sup>62</sup> Verbrugge (2003).

<sup>63</sup> Copeland et al. (2000).

<sup>64</sup> Prahalad (1994).

<sup>65</sup> Drew et al. (2006); Gamble & Kelly (2001); Omran et al. (2002); Smith (2003).

All the above arguments suggest a conflicting outlook amongst staff from various disciplines concerning the objectives of ERM. An embracing objective to overcome these conflicts is necessary and this points to the “interest of stakeholders” as the ultimate objective for ERM.

### 5.5 ERM is a General Risk Management Function

In insurance organizations risk management is a part of general management<sup>66</sup> and should maximize the efficiency of productivity.<sup>67</sup> However, productivity is only a by-product of scientific risk management, but the immediate goal of risk management is to ensure the security of the firm.<sup>68</sup> Due to the involvement of the finance profession in risk management, the speculative element (embodying possible gain and loss) has become a prominent feature of ERM decision making. However, the recent focus on operational risk has brought the pure risk (focussing on potential losses) purpose of risk management more fully into the picture. All of these findings indicate that risk management must be embedded into the strategic decision making process. However, this can only be achieved by bringing ERM into line with general management functions, where risk management remains at the core of more general management.<sup>69</sup> Consequently, to achieve this, risk management needs contributions from a range of disciplines.<sup>70</sup>

### 5.6 Operational Risks

The survey of the CASES confirms that operational risk (e.g., human error, fraud, systems failure, etc.) is a major risk to insurers’ operations.<sup>71</sup> The study discovers two important aspects of operational risk (i.e., bad luck and bad housekeeping), and the focus of the management of the operational risk in the CASES is to establish sound housekeeping. Operational risks are found to be context driven and embedded in management culture, organizational structure, and the desires of those who manage risk. It is felt that the management of operational risks does not explicitly drive value of the organization. However, it obviously provides competitive advantage. The study reveals that providing incentives to individual employees (or business units/departments) in reporting operational risks is an important aspect of developing a database and also for its effective management.<sup>72</sup> However, the key challenge is managers’ intentional avoidance of responsibility through delegating this to others. The success of operational risk management depends on the reporting arrangements in place and the capability of the organization in building and maintaining “trust” of all employees within the organization. The study of the CASES identifies that the consequences of large operational risk can be devastating (e.g., loss of reputation) and this often remains hidden because of the lack of effective communication.<sup>73</sup>

## 6. CONCLUSION

ERM is an emerging topic but is beginning to mature as a result of initiatives from at least two perspectives: a finance-driven shareholder value model and a compliance-driven risk governance model.<sup>74</sup> The literature suggests that ERM is an interdisciplinary subject and needs to be handled from a variety of disciplinary perspectives (e.g., finance, economics, psychology and philosophy, etc). However, the research concludes that ERM, as currently practiced by insurance companies, still remains a subject of a single discipline (finance). However, the study identifies two key principles of effective ERM in

<sup>66</sup> Crockford (1976); Drucker (1974).

<sup>67</sup> Mehr & Hedges (1963).

<sup>68</sup> Gahin (1971).

<sup>69</sup> Crockford (1976); Haller (1978); Mehr & Hedges (1963).

<sup>70</sup> Haimes et al. (2002); Ward (2003).

<sup>71</sup> Dickinson (2001).

<sup>72</sup> Besley & Ghatak (2005).

<sup>73</sup> Argent (2005); Drzik (2005); Gray & Densten (2005); Power (2005b); Schwamm (2005).

<sup>74</sup> Dickinson (2001); Dickinson (2005); Lam (2003); Power (2004b).



insurance companies: (i) ERM should ensure continuous solvency of insurers, even at the moment of crisis; (ii) ERM should encourage organizations to accept more risks consciously in achieving their corporate goals. However, the picture of ERM which emerges from the research does not deny rationality, but views ERM in terms of market and regulatory pressure, which the study suggests is a momentary phenomena of time. Above all, the study suggests that a complete, effective ERM system for insurance companies needs a certain degree of interdisciplinary treatment, as the theoretical framework suggests.

The article aimed to answer five research questions and the in-depth analysis of the CASES reveals the following:

1. There exists an inconsistent understanding of ERM within insurance companies. Most companies believe ERM involves the management of “all risks” but the definition of “all risks” varies significantly from one company to another and from one discipline/profession to another within a company.
2. The study identified a range of interrelated motivators for developing ERM in insurance companies. The most important of these appears to be regulations (solvency and corporate governance), and the leadership of CEO. However, market competition and the size of the organizations (large, which needs to control) influence both regulations and the actions of the CEO. Consequently, the ultimate driver of ERM might be the growing size of the organization and the market competition. Whilst competition influences organizations to consider short term strategy (binding them to take more risks), regulations intend to ensure the capacity of the insurers to maintain the promises they have made to their consumers.<sup>75</sup> However, regulations stimulate ERM of CASES because without the influence of regulations they might not have developed ERM or at least not in such a speedy manner.
3. The design of ERM is very company specific and depends on many factors (i.e., the business model in terms of type of business, geographical presence, etc.). It also depends on the risk appetite of the organization, which includes both qualitative and quantitative elements.
4. Communication and cultural barriers are the key operational challenges to implementing ERM. Moreover, risk measurement and inadequate data are the key technical challenges to the effective implementation of ERM.
5. The CASES have not found effective means of measuring the performance of ERM, and whether the performance of ERM is measured *ex-ante* or *ex-post* remains a key issue for organizations.

In summary, the case studies revealed a number of differences between the models of ERM suggested by the literature and those currently in place in leading insurance companies. In particular, the literature suggests that ERM is an interdisciplinary subject<sup>76</sup> and requires the joint application of mathematics, social sciences, and law. More specifically it requires the joint effort of financial risk management and strategic management,<sup>77</sup> which are emerging in the convergence of shareholder value models and risk governance models towards corporate reputation management. However, this approach is far from the reality of the ERM practiced in the CASES.

## ACKNOWLEDGEMENT

The authors gratefully acknowledge the contribution of the four case study companies; in particular for allowing their staff to provide interviews. In addition, the authors wish to thank anonymous industry observers for their views on the topics.

---

<sup>75</sup> Farny (1990); Mehr & Hedges (1973).

<sup>76</sup> Althaus (2005); Selim & McNamee (1999).

<sup>77</sup> Dickinson (1997).

## BIBLIOGRAPHY

Aabo, T., Fraser, J.R.S., & Simkins, B.J. (2005) 'The Rise and Evolution of the Chief Risk Officer: Enterprise Risk Management at Hydro One', *Journal of Applied Corporate Finance* **17**(3): 62–75.

Althaus, C.E. (2005) 'A Disciplinary Perspective on the Epistemological Status of Risk', *Risk Analysis* **25**(2): 567–588.

Argent, P.A. (2005) 'The challenge of protecting reputation', *Financial Times*, London, 30 September, pp. 2–3.

Athearn, J.L. (1971) 'What is Risk?', *The Journal of Risk and Insurance*, **38**(4): 639–645.

Barbalet, J. (2005) *Trust and Uncertainty: the emotional basis of rationality*, paper presented at SCARR Network Trust Conference, London, 12 December.

Barfield, R., & Palmer, A. (2002) *Economic Capital: At the heart of managing risk and value*, Executive e-briefing, New York: PriceWaterHouseCoopers & EIU, Jan–Feb.

Belmont, D.P. (2004) *Value Added Risk Management in Financial Institutions*, Singapore: John Wiley & Sons (Asia) Pte Ltd.

Berghe, L. van den, & Louche, C. (2005) 'The Link Between Corporate Governance and Corporate Social Responsibility in Insurance', *The Geneva Papers on Risk and Insurance: Issues and Practice* **30**(3): 425–442.

Besley, T., & Ghatak, M. (2005) 'Incentives, risk and accountability in organizations', in Hutter, B., & Power, M. (Eds) *Organizational Encounters with Risk*, Cambridge: Cambridge University Press, pp. 149–166.

Calandro, J., & Lane, S. (2002) 'The Insurance Performance Measure: Bringing Value to the Insurance Industry', *Journal of Applied Corporate Finance* **14**(4): 94–99.

Cochran, P.L., & Wood, R.A. (1984) 'Corporate Social Responsibility and Financial Performance', *The Academy of Management Journal* **27**(1): 42–56.

Copeland, T., Koller, T., & Murrin, J. (2000) 'Valuing Insurance Companies', *Balance Sheet* **8**(6): 36–46.

Crockford, G.N. (1976) 'The Changing face of Risk Management', *The Geneva Papers on Risk and Insurance: Issues and Practice* **1**(2): 10–15.

Davenport, E., & Bradley, M. (2000) *Enterprise Risk Management: a consultative perspective*, Casualty Actuarial Society, Discussion Paper, Program on Insurance in the Next Century. Accessed on [www.casact.org/pubs](http://www.casact.org/pubs)

Denenberg, H.S., & Ferrari, J.R. (1966) 'New Perspectives on Risk Management: The Search for Principles', *The Journal of Risk and Insurance* **33**(4): 647–661.

Diacon, S., O'Brien, C. & Blake, A. (2005) *The Economic Value of General Insurance*, Association of British Insurers, Accessed on [www.abi.org.uk/generalinsurance](http://www.abi.org.uk/generalinsurance).

Dickinson, G. (2001) 'Enterprise Risk Management: Its Origins and Conceptual Foundation', *The Geneva Papers on Risk and Insurance: Issues and Practice* **26**(3): 360–366.

- Dickinson, G. (2005) 'The evolution of enterprise risk management', in Taplin, R. (Ed) *Risk Management and Innovation in Japan, Britain and the USA*, London: Routledge, pp. 150–161.
- Dickinson, G.M. (1997) 'Integrating Insurance and Hedging Decisions into the Overall Risk Management of the Firm', *Singapore International Insurance and Actuarial Journal* **1**(Inaugural Issue): 161–173.
- Douglas, M., & Wildavsky, A. (1982) *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers*, Berkeley: University of California Press.
- Drew, S.A., Kelley, P.C., & Kendrick, T. (2006) 'CLASS: Five elements of corporate governance to manage strategic risk', *Business Horizons* **49**(2): 127–138.
- Drucker, P.F. (1974) *Management: Tasks, Responsibilities, Practices*, London: William Heinemann Ltd.
- Drzik, J. (2005) 'New Directions in Risk Management', *Journal of Financial Econometrics* **3**(1): 26–36.
- Farny, D. (1990) 'Fourth Geneva Lecture: Corporate Strategy of European Insurers', *The Geneva Papers on Risk and Insurance: Issues and Practice* **57**(Oct.): 372–389.
- Gahin, F.S. (1971) 'Review of the Literature on Risk Management', *The Journal of Risk and Insurance* **38**(2): 309–313.
- Gamble, A., & Kelly, G. (2001) 'Shareholder Value and the Stakeholder Debate in the UK', *Corporate Governance: An International Review* **9**(2): 110–117.
- Gray, J.H., & Densten, I.L. (2005) 'Towards an Integrative Model of Organizational Culture and Knowledge Management', *International Journal of Organizational Behavior* **9**(2): 594–603.
- Haimes, Y.Y., Kaplan, S., & Lambert, J.K. (2002) 'Risk Filtering, Ranking, and Management Framework Using Hierarchical Holographic Modelling', *Risk Analysis* **22**(2): 383–379.
- Haller, M. (1978) 'New Dimensions of Risk: Consequences for Management', *The Geneva Papers on Risk and Insurance: Issues & Practice* **7**: 3–15.
- Haynes, J. (1895) 'Risk as an Economic Factor', *The Quarterly Journal of Economics* **IX**(4): 409–449.
- Heal, G. (2005) 'Corporate Social Responsibility: An Economic and Financial Framework', *The Geneva Papers on Risk and Insurance: Issues and Practice* **30**(3): 387–409.
- Hogg, M.R. (2005) 'Intangible assets, risk management and insurance', in TAPLIN, R. (Ed) *Risk management and innovation in Japan, Britain and the United States*, London: Routledge, pp. 45–75
- Hood, C. (1996) 'Control Over Bureaucracy: Cultural Theory and Institutional Variety', *Journal of Public Policy* **15**(3): 207–230.
- Hutter, B., & Power, M. (2001) 'Risk Management and Business Regulation', in Pickford, J. (Ed) *Mastering Risk: Concepts*, London: Financial Times Prentice Hall, pp. 165–168.
- James, H. (1968) 'New Perspectives on Risk Management: Comments', *The Journal of Risk and Insurance* **35**(4): 607–610.

- Kleffner, A.E., Lee, R.B., & McGannon, B. (2003) 'Stronger Corporate Governance and its Implications on Risk Management', *Ivey Business Journal*, May/June.
- Kloman, F. (2003) 'Using scenarios', *Risk Management Reports* 30(4).
- Kloman, H.F. (1992) 'Rethinking Risk Management', *The Geneva Papers on Risk and Insurance: Issues and Practice* 64: 3–15.
- Lam, J. (2003) *Enterprise Risk Management: from Incentives to Controls*, Hoboken, NJ: John Wiley & Sons Inc.
- Lee, C.R., & Shimpi, P. (2005) 'The Chief Risk Officer: What Does It look Like and How Do You Get There?', *Risk Management Magazine* 52(9).
- Liebenberg, A., & Hoyt, R. (2003) 'The Determinants of Enterprise Risk Management: Evidence From the Appointment of Chief Risk Officers', *Risk Management & Insurance Review* 6(1): 37–52.
- Long, H.D., Hedgea, J.E., & Beadles, W.T. (1962) 'Curricular Concepts in Risk and Insurance', *The Journal of Insurance* 29(2): 256–264.
- March, J.G., Shapira, Z. (1987) 'Managerial Perspectives on Risk and Risk Taking', *Management Science* 33(11): 1404–1418.
- Marsiglia, E., & Falautano, I. (2005) 'Corporate Social Responsibility and Sustainability Challenges for a Bancassurance Company', *The Geneva Papers on Risk and Insurance: Issues and Practice* 30(3): 485–497.
- Masuda, J.R., Garvin, T. (2006) 'Place, Culture, and the Social Amplification of Risk', *Risk Analysis* 26(2): 437–454.
- Mathur, S.K. (2001) 'Insurance Regulation: Some Issues', *The Geneva Papers on Risk and Insurance* 26(1): 54–70.
- Mcguire, J.B., Sundgren, A., & Schneeweis, T. (1988) 'Corporate Social Responsibility and Firm Financial Performance', *The Academy of Management Journal* 31(4): 854–872.
- Mehr, R.I., & Forbes, S.W. (1973) 'The Risk Management Decision in the Total Business Setting', *The Journal of Risk and Insurance* 40(3): 389–401.
- Mehr, R.I., & Hedges, B.A. (1963) *Risk Management in the Business Enterprise*, Homewood: IL: Richard D. Irwin, Inc.
- Mehr, R.I., & Hedges, B.A. (1974) *Risk Management: Concepts and Applications*, New York: McGraw-Hill Education.
- Miller, K.D. (1992) 'A Framework for Integrated Risk Management in International Business', *Journal of International Business Studies* 3(2): 311–331.
- Nielson, N.L., Kleffner, A.E., & Lee, R.B. (2005) 'The Evolution of the Role of Risk Communication in Effective Risk Management', *Risk Management & Insurance Review* 8(2): 279–289.
- O'hara, B.M. (2006) 'Risk and Value: Changing Perceptions and Cultural Challenges for the Property and Casualty Industry', *The Geneva Paper on Risk and Insurance: Issues & Practice* 31(1): 83–87.

- Omran, M., Atrill, P., & Pointon, J. (2002) 'Shareholders Versus Stakeholders: Corporate Mission Statements and Investor Returns', *Business Ethics: A European Review* **11**(4): 318–326.
- Osterloh, M., & FREY, B.S. (2000) 'Motivation, Knowledge Transfer, and Organizational Forms', *Organization Science* **11**(5): 538–550.
- Otway, H. (1992) 'Public, Wisdom, Expert Fallibility: Toward a Contextual Theory of Risk', in Krinsky, S., & Golding, D. (Eds) *Social Theories of Risk*, Westport: CT: Praeger Publishers, pp. 215–228.
- Power, M. (2004a) *Risk Management for Everything: Rethinking the Politics of Uncertainty*, London: Demos.
- Power, M. (2004b) 'Enterprise Risk Management and the organization of uncertainty in financial institutions', in Cetina-Knorr, K., & Preda, A. (Eds) *The Sociology of Financial Markets*, Oxford: Oxford University Press, pp. 250–268.
- Power, M. (2005a) 'Organizational responses to risk: the rise of the chief risk officer', in Hutter, B., & Power, M. (Eds) *Organizational Encounters with Risk*, Cambridge: Cambridge University Press, pp. 132–148.
- Power, M. (2005b) 'The invention of operational risk', *Review of International Political Economy* **12**(4): 577–599.
- Prahalad, C.K. (1994) 'Corporate Governance or Corporate Value Added?: Rethinking the Primacy of Shareholder Value', *Journal of Applied Corporate Finance* **6**(4): 40–50.
- Renn, O. (1992) 'Concepts of Risk: A Classification', in Krinsky, S., & Golding, D. (Eds) *Social Theories of Risk*, Westport: CT: Praeger Publishers, pp. 53–79.
- Renn, O. (2004) 'Perception of Risks', *The Geneva Papers on Risk and Insurance Issues & Practice* **29**(1): 102–114(13).
- Rippl, S. (2002) 'Cultural Theory and Risk Perception: A Proposal for a Better Measurement', *Journal of Risk Research* **5**(2): 147–165.
- Rogers, J. (2002) *Strategy, Value and Risk: The Real Option Approach*, Basingstoke: Palgrave Macmillan.
- Ross, S.A. (2001) 'Financial Regulation in the New Millennium', *The Geneva Papers on Risk and Insurance* **26**(1): 8–16.
- Rottman, D.L. (1971) 'Corporate Risk Manager's Contribution to Profit: Comment', *The Journal of Risk and Insurance* **38**(2): 299–302.
- Schwamm, H. (2005) 'Reputation Risk: The biggest risk banks and insurance companies face today', *The Geneva Association Risk Management Newsletter* **38**(November), pp. 5–7.
- Selim, G., & Mcnamee, D. (1999) 'The Risk Management and Internal Auditing Relationship: Developing and Validating a Model', *International Journal of Auditing* **3**(3): 159–174.
- Shanteau, J. (2000) 'Psychological perspectives on risk management', in GREEN, B. (Ed) *Risk Behavior and Risk Management in Business Life*, London: Kluwer Academic Publishers, pp. 17–19.

- Short, J.F. (1984) 'The Social Fabric at Risk: Toward the Social Transformation of Risk Analysis', *American Sociological Review* **49**(6): 711–725.
- Simon, A., Sharma, P., & William, M. (2003) *Lessons about Risk: Analysing the Casual Chain of Insurance Company Failure*, London: Financial Services Authority.
- Skipper, H.D. (2005) 'Why Do They Dislike Us?', *The Geneva Association Newsletter – Insurance Economics* **52**, pp. 1–3.
- Skipper, H.D., & Skipper, T.C. (2001) 'The Importance of Culture in Risk and Insurance', in Kielholz, W., & Liedtke, P.M. (Eds) *Strategic Issues in Insurance: Essays in Honour of Orio Giarini*, Geneva: The Geneva Association, pp. 133–147.
- Slovic, P. (1972) 'Psychological Study of Human Judgement: Implications for Investment Decision Making', *The Journal of Finance* **27**(4): 779–799.
- Slovic, P., Finucane, M., Peters, E., & Macgregor, D.G. (2004) 'Risk as Analysis and Risk as Feelings: Some Thoughts about Affect, Reason, Risk, and Rationality', *Risk Analysis* **24**(2): 311–322.
- Smith, R. (2003) 'Audit committees combined code guidance', *Financial Reporting Council*, pp. 1–52.
- Stahel, W.R. (2005) 'Chief Risk Officers and their role', *The Geneva Association Newsletter – Risk Management*, **38**, November, pp. 1–4.
- Tansey, J. (2004) 'Risk as politics, culture as power', *Journal of Risk Research* **7**(1): 17–32.
- Taylor-Gooby, P., & Zinn, J.O. (2006) 'Current Directions in Risk Research: New Developments in Psychology and Sociology', *Risk Analysis* **26**(2): 397–411.
- Verbrugge, J. (2003) 'University of Georgia Roundtable on Enterprise-wide Risk Management', *Journal of Applied Corporate Finance* **15**(4): 8–26.
- Wade, J. (2003) 'Corporate Social Responsibility: opportunities and risks', in Jolly, A. (Ed) *Managing Business Risk*, London: Kogan Page Limited, pp. 98–104.
- Wang, S. (2004) 'ERM: Myth vs. Reality', *The Actuarial Review* **13**(2): 9–10.
- Ward, S. (2001) 'Exploring the Role of the Corporate Risk Manager', *Risk Management: An International Journal* **3**(1): 7–25.
- Ward, S. (2003a) 'Approaches to Integrated Risk Management — A Multi-Dimensional Framework', *Risk Management – An International Journal*, **5**(4): 7–23.
- Ward, S., & Chapman, C. (2003b) 'Transforming Project Risk Management into Project Uncertainty Management', *International Journal of Project Management* **21**(2): 97–105.
- Zinn, J.O. (2004a) *Literature Review: Economics and Risk*, University of Kent at Canterbury, ESRC Priority Network Social Contexts and Responses to Risk, Working Paper No. 2.
- Zinn, J.O. (2004b) *Literature Review: Sociology and Risk*, University of Kent at Canterbury, ESRC Priority Network Social Contexts and Responses to Risk, Working Paper No. 1.
- Zinn, J.O. (2006) 'Recent Developments in Sociology of Risk and Uncertainty', in Zinn, J.O., & Taylor-Goodby, P. (Eds) *Learning about Risk*, Forum: Qualitative Social Research, Available at <http://www.qualitative-research.net/fqs/fqs-e/>.