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## Introduction

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**Biographical notes:** Desheng Dash Wu is a Tenured Assistant Professor at Reykjavik University, Iceland, and Affiliate Professor at RiskLab, University of Toronto. He is a Director of RiskChina Research Center and an Elected Member of the Professional Risk Managers' International Association Academic Advisory Committee. He serves as the Editor-in-Chief of *International Journal of Services Sciences*, *Journal of Financial Services Management*, *Journal of Environment and Sustainable Development*, *Journal of Innovation and Sustainable Development*, and as Guest Editor, and Editorial Board Member of various journals such as *Annals of OR*, *Technological Forecasting and Social Change*, and *Computers and Operations Research*. He has more than 70 refereed journal publications and three books in the area of Enterprise Risk Management (ERM) and decision analysis.

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## 1 Introduction

Over the past several decades, both risk issues and environmental topics have attracted a great deal of attention from both researchers and practitioners. Risk refers to the uncertain change of the future value of an entity of interests. Traditionally, risks are tied to the loss resulting from the change of a risky event. Risk management can be used as a tool for greater rewards, not just control against loss.

During the past decade, people have substantially used various high technologies for loss-prevention and control systems in environmental issues, such as natural disasters, fires, and accidents, and quantitative models in derivatives for insurances and finance. This trend is obvious after the encouragement from traumatic recent events such as 9/11/2001 and business scandals, including Enron and WorldCom (Baranoff, 2004). Risk management in the environment has not only developed a control focus, but most importantly it remains a tool to enhance the value of a system composed of both people and the environment. An integrated approach to manage the risks facing an organisation and the most effective ways to take risk include new business philosophies such as Enterprise Risk Management (ERM) (Olson and Wu, 2008).

This rest of the paper is organised as follows: Section 2 presents types of risk. Section 3 discusses the topics and contributions in this special issue. The last section concludes this paper.

## 2 Types of risk

In general, risk can be viewed as the uncertain change of the future value of an entity of interests. This indicates that risks can be understood from both the loss and benefit side. If people are faced with a risk that they are specialists in dealing with, the encounter is viewed as an opportunity. Five groups of risks are identified as follows (Drew, 2007):

- *Opportunities* – events presenting a favourable combination of circumstances giving rise to the chance for beneficial activity
- *Killer risks* – events presenting an unfavourable combination of circumstances leading to hazard or major loss or damage resulting in permanent cessation of operations
- *Other perils* – events presenting an unfavourable combination of circumstances leading to hazard or loss or damage leading to disruption of operations with possible financial loss
- *Cross functional risks* – common risks leading to potential loss of reputation
- *Business process unique risks* – risks occurring within a specific operation or process, such as withdrawal of a particular product for quality reasons.

Opportunities should be capitalised upon in most circumstances. Not taking advantages of opportunities leads to growth of competitors, and thus increased risk. If opportunities are pursued, enterprise strategy can be modified to manage the particular risks involved. Killer risks are threats to enterprise survival, and call for continuous risk treatment, monitoring, and reporting. The other perils require analysis to assess ownership, treatment, residual risk, measurement, and reporting (Olson and Wu, 2008).

There is an increasing tendency toward an integrated or holistic view of risks. ERM is an integrated approach to achieving the enterprise's strategic, programmatic, and financial objectives with acceptable risk. The philosophy of ERM generalises these concepts beyond financial risks to include all kinds of risks beyond disciplinary silos (Olson and Wu, 2008).

## 3 This issue

Our call for papers cited substantial and important growth in the methodology development to interdisciplinary problems arising in risk and environment. We seek to provide the primary forum for both academic and industry researchers and practitioners to propose and foster discussion on state-of-the-art research and development in the areas of risk and environment.

This special issue includes the broad coverage we were seeking, with an empirical paper analysing the levels of human-induced greenhouse gas emissions on Annex I countries ability to meet Kyoto targets, a case study of credit risk environment in Korea,

two theoretical papers (assessment of water quality observation stations and risk assessment of land use suitability), a methodology paper on the distribution of trace metals in surface water system using a statistical approach, and a paper on theoretical modelling research using conflict analysis in supplier evaluation under environmental uncertainty.

Regulators and policy makers are always concerned about environmental and risk issues. For example, in the late 1990s there has been much debate on whether to include "Land Use, Land Use Change and Forestry (LULUCF) activities under the Kyoto Protocol". Therefore, this issue selected two qualified works to address this theme from the perspective of regulators and policy makers by Maraseni et al. and Choi et al., respectively.

Three Australian scholars (Maraseni, Maroulis, and Nooriafshar) study the 1990 and current greenhouse gas emissions data from Annex I countries and assess the impacts of LULUCF activities of countries in meeting their Kyoto targets. They conclude that LULUCF activities play a significant role in ensuring nations meet their Kyoto targets.

Choi et al. studied risk-effective sustainability of policies in the small businesses credit environment in Korea. They argue that, as the ecological or environmental risks such as air pollution transformed into the economical issues such as CO<sub>2</sub> restrictions, environmental risks can be considered to be analysed in the economical system.

Risk assessment for suitability is one of the main problems in city land use planning for disaster prevention. Zhu, Su and Wu developed a GIS-based ordered weighted averaging approach to analyse land-use suitability. Data from a geological disaster in Tangshan City of China are used to calculate the distances from dangerous areas or safe areas to yield evaluation criteria for all disaster factors of land use suitability. The relationship between decision-making risk and land use suitability is investigated. By contrasting the distribution of floor area ratio with land use suitability, some advice is proposed for land use planning in Tangshan City.

Yerel and Anagun investigated variations in the surface water quality parameters of the observation stations using cluster analysis and ordinal logistic regression techniques. They show that nitrite, ammonium, and total phosphorus were identified as the parameters that displayed essential variations. They conclude that domestic, agricultural and industrial discharges strongly affected the northwest part of the Tahtali dam reservoir in Turkey.

This issue concludes with a theoretical study of environmental issues in enterprises by Deng and Xu. As environmental issues are of increased concern, many enterprises have participated in some forms of green purchasing initiatives. Beside the traditional criteria, such as quality, cost, availability, service and responsiveness, the supplier's environmental consciousness, environmental mission, advances in developing environmentally friendly goods should be evaluated as well. Deng and Xu propose a conflict evaluation method based on measuring inconsistent attitudes toward important environmental issues with risk and uncertainty considered. A pre-qualification process is suggested for screening the suppliers by eliminating those conflicts with the buyer firm with regard to some environmental issues.

There are other approaches to model risk and environment, and we would encourage papers demonstrating how risks are optimised for environmental management.

#### **4 Conclusion**

Maintaining a certain level of risk is one of the key strategies to make profits in today's economy (Wu and Olson, 2008). Risks and environment have become an important topic in today's more complex, interrelated global business environment, replete with threats from natural, political, economic, and technical sources. We have discussed risks and environment in this special issue from different silo disciplinary perspectives.

#### **Acknowledgements**

We thank all the referees for their valuable time and effort. We thank the Editor-in-Chief, Dr. M.A. Dorgham, for many valuable suggestions, his energy and effort in bringing out this special issue.

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