

## Foreword

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Enterprise risk management (ERM) has been recognized as being one of the most important issues in business management in the last decade. Anette (2009) reported systematic variations in ERM practices in the financial services industry, with number-driven ERM at one extreme, and a more holistic approach at the other extreme. Storero (2009) argued the need to monitor and address all risks inherent in organizational operations as necessary to avoid economic catastrophe. This is not new, as Nocco and Stulz (2006) argued the need to consider all corporate risks within a single ERM framework in order to gain long-run competitive advantage.

This special volume collects papers dealing with various aspects of ERM in a variety of fields important in the emerging global economy. ERM is a systematic, integrated approach to managing all risks facing an organization (Wu and Olson 2010; Olson and Wu 2010). ERM focuses on board supervision, aiming to identify, evaluate, and manage all major corporate risks in an integrated framework (Gates and Nanes 2006). Consideration of risk has always been with business, manifesting itself in medieval coffee houses such as Lloyd's of London, spreading risk related to cargos on the high seas.

The field of insurance developed to cover a wide variety of risks, related to external and internal risks covering natural catastrophes, accidents, human error, and even fraud. Financial risk has been controlled through hedge funds and other tools over the years, often by investment banks. With time, it was realized that many risks could be prevented, or their impact reduced, through loss-prevention and control systems, leading to a broader view of risk management.

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Enterprise risks are inherently part of corporate strategy. Thus consideration of risks in strategy selection can be one way to control them. ERM can be viewed as top–down by necessity for this reason. Olson and Wu (2008a) looked at risk management from five perspectives. These perspectives were financial, accounting, supply chain, information system, and disaster management. Olson and Wu (2008b) included the added perspective of project management. The point is that ERM principles that began in the financial sector can be applied in other fields as well.

This special volume presents research in three of these fields: information technology, finance, and supply chain management. It uses a diverse set of research, with analytic models, models dealing with financial data in time series, optimization models, data mining models, and scenario analysis demonstrated on an optimization model. Each paper demonstrates how operations research tools of various sorts can be applied in the broad context of risk management.

Li and Zhu give a case study of a decision involving a group of six experts in selecting from among seven object-oriented analysis design tools. The process of criteria weight development is described and applied to a multi-objective programming optimization model. Factors considered include risk in the form of testing, usability, and vendor viability assessments. The sensitivity applied provides a means to assess the degree of risk involved in the decision. Data come from trade publications, vendor documentation, and the decision making organization's specifications.

The next five papers involve various aspects of financial risk modeling. Cao et al. compare predictive capabilities of alternative neural network models. These neural network models are found to be superior to linear regression models, and statistically indifferent to CAPM and three-factor models. Elkhodiry et al. extend Hull et al. (2005) model estimating credit spreads in the equity option market. Time series analysis is used to test the relationship between credit spread and equity volatility with positive results. Zagst and Kraus derive parameter conditions yielding stochastic dominance up to third-order dominance, and study model volatility implied with observed volatility. Greco et al. deal with data over 52 countries and generate rules easily describing the expert preference input upon which the model was based. Wahab and Lee base their study on commodity market data, developing a framework for pricing swing options and demonstrating the framework with numerical examples.

The last four papers involve broader domains of risk management. Borgonovo and Pecati apply scenario analysis to reflect managerial insight to a workforce allocation previously presented by Corominas et al. (2004). Delen et al. apply alternative data mining tools to geographic data which could be used for many supply chain decisions, to include bio-vigilance (seeking to identify risks in terms of patterns and trends for events such as epidemics). Yang et al. present a supply chain production possibility set and apply it to effectively conduct supply chain performance management. Xu et al. develop a lambda-mean-hybrid entropy model to deal with portfolio selection problem with both random uncertainty and fuzzy uncertainty.

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