Preface

We are living in a risky world, and it is getting riskier and riskier. As one of my fundamental claims that have been delivered to various audience including scholars, practitioners and government officers, first, risk avoidance system in today's world is becoming so interconnected; second, it is fully supported by a great of risk issues that have been addressed in this edited volume. Such risk issues, to name a few, include typical financial risk such as credit risk and market risk, construction risk management, supply chain risks, energy risk assessment, environmental risk analysis, risk management and sustainable development. These risk issues altogether form a risk checklist that could support my second claim: risk is unavoidable and business exists to cope with risks in their area of specialization. In William Sharpe's CAPM (capital asset pricing model) theory, investments are evaluated in terms of both risk and return relative to the market as a whole; the riskier a business stock, the greater profit potential. Thus risk implies opportunity and business exists to seek such risk-based opportunities.

Prediction of extreme risk events is almost unlikely. In Taleb's 2007 book titled "Black swan", extreme risks are said to be unpredictable like a black swan that lies beyond the realm of normal expectations. Many firms experienced difficulties from black swan bubbles. The most spectacular failure in the late twentieth century was probably that of Long-Term Capital Management [1], but that was only a precursor to the more comprehensive failure of technology firms during the dot.com bubble around 2001. The problems of interacting cultures demonstrated risk from terrorism as well, with numerous terrorist attacks, to include 9/11 in the U.S.

The third claim is that effective risk management needs integration of various risks facing the organization. National Research Council has two red books on risk analysis and management: one is from that 1983 titled "Risk Assessment in the Federal Government: Managing the Process" and the other from 2009 titled "Science and Decisions Advancing Risk Assessment". One of our observations is that the updated version "Recommends that risk management would become more integrated with the risk assessment process and focuses attention on improving the utility of risk assessments to better inform risk management decision-making"

[2, 3]. Enterprise risk management has been defined as a process that uses integrated, systematic approaches to manage risks that faces the organization. Therefore, enterprise risk management has been deemed as an effective risk management philosophy.

In the past, we have tried to discuss different aspects of risk, to include finance, information systems, disaster management, and supply chain perspectives [4, 5, 6]. In this edited volume, we present the state-of-the-art views of the perspective of enterprise risk management, to include frameworks and controls in the ERM process with respect to supply chains, constructions, and project, energy, environmental and sustainable development risk management.

The bulk of this volume is devoted to presenting a number of modeling approaches that have been (or could be) applied to enterprise risk management in construction from the 1st International Conference on Sustainable Construction and Risk Management in Chongqing Municipality, P. R China. We include decision analysis models, auction models to better enable risk managers to trade off conflicting criteria of importance in their decisions. Monte Carlo simulation models are the obvious operations research tool appropriate for risk management. Rough Set and fuzzy set theories are employed. Dynamic models such as dynamic AHP and Bayesian Networks are used to handle risky project management when achieving sustainable development purpose. We hope that this book provides some view of how quantitative models can be applied by more readers faced with enterprise risk.

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