Introduction

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Abstract: Recent disasters illustrate the need for businesses to be resilient when confronting operational risks. Firms that do not plan for disasters face a competitive disadvantage that can lead to losses beyond the immediate losses from the disaster itself. Disaster recovery management can reduce these losses and help businesses recover from catastrophic events. This introduction briefly discusses the articles in this special issue, which help form an academic foundation for this evolving field.

Keywords: disaster recovery; business resiliency; decision-making; risk management; corporate response; operational risk.

Biographical notes: Holmes E. Miller is a Professor of Business at Muhlenberg College, USA. Prior to coming to Muhlenberg, he taught at the Rensselaer Polytechnic Institute and worked in industry for Union Carbide Corporation and Chase Manhattan Bank, where he developed and implemented corporate programmes for business continuity and information security. He is on the editorial board of the *International Journal of Business Continuity and Risk Management* and teaches courses in operations management, management science, information systems and electronic commerce. He has a PhD in Management Science from Northwestern University and has published numerous papers in operations management, risk management and decision modelling.

1 Introduction

For years when faced with normal discontinuities in operations, resilient firms have kept functioning by employing classical managerial approaches to capacity, customer service, production, information systems, scheduling, distribution, and human resources. In the past some of these firms may have had disaster recovery (used here synonymously with business continuity) plans but those that did not, or those that had superficial plans, were not disadvantaged relative to the competition because if a disaster struck, many of their competitors were in the same situation. Times have changed! Recent history indicates that customers now expect an organisation to be up and running even when faced with catastrophic events that threaten service continuity. Targeted approaches to business resiliency and disaster recovery management are now on many organisations' 'must have' list.

Individuals who work in this area recognise that managing business resiliency can be a thankless job because it often involves allocating significant financial, technological, and human resources to plan for events that most likely will never occur. Managers who

fail to plan for disasters gamble that no disaster events will occur on their watch. If they are lucky, they move on and the vulnerabilities left in their wake become someone else's problem. Although in the past many managers have gotten away with this lack of planning and even malfeasance, a consensus has formed recognising that firms that operate without a disaster recovery plan tempt ruin. The risks of failing to plan for disasters have been highlighted not only by highly visible natural disasters, but also by new systemic vulnerabilities created by globalisation, technological dependence, and interdependencies within supply chains. Firms that *do* have effective plans to ensure business resiliency have upped the costs for those that do not. Managers no longer can excuse poor planning by claiming that a fire or flood or hurricane was an unpredictable act of God. Rather, managers are expected to have implemented and tested disaster recovery plans in the same manner that they are expected to have marketing, financial, and operational plans.

To date much of the existing disaster recovery literature has been practitioner oriented, focusing on methodologies, checklists, and case studies. Less robust is the academic literature which can underpin further developments in the field. This special issue of the *International Journal of Technology, Policy and Management* addresses this need by presenting seven papers that focus on various aspects of business resiliency and disaster recovery planning.

2 Decision-making and infrastructure

In managing disaster risk, decisions are made by evaluating alternatives, be they strategic or tactical in nature. Examples include allocating limited disaster recovery resources to competing alternatives; deciding whether to spend a limited budget on mitigating risks rather than on disaster recovery; or weighing the importance of funds saved vs. the loss of 'public image' due to poor publicity. In 'Incomplete preferences in disaster risk management' Espinoza and Peterson address this phenomenon of incomplete preferences in disaster risk management. 'Incomplete preferences' mean that Alternative A is not preferred to Alternative B or vice versa, nor is a decision-maker indifferent between the two. When preferences are indeterminate Espinoza and Peterson introduce a new concept to analyse incomparable choices that is consistent with preferences still being revealed through choice behaviour. They do this by developing a probabilistic preference function and provide examples of how their methodology may be applied to decision-making in disasters such as Hurricane Katrina.

Major disasters that have occurred over the past few years coupled with the events of September 11th have motivated corporations to mobilise their resources to respond to disasters. These provide an infrastructure whose resources organisations can draw on when faced with dealing with the aftermath of a disaster. Statler *et al.* in 'Mobilising corporate resources to disasters: a comparative analysis of major initiatives' present descriptive research findings regarding various programmes implemented by six organisations charged with the responsibility or mediating the transfer of resources between private sector capabilities and public sector needs. The authors present findings on how the organisations (supported by various business-related constituencies) are organised, funded, and how they respond to the various phases of disaster management. In addition to presenting valuable data, the authors develop a new theory addressing issues related to traditional tensions that exist between corporate social performance and

corporate financial performance, and discuss how their theory frames how corporations mobilise resources to disasters as a strategic attempt to develop resilience efforts as a common intangible asset of the corporation.

While a specific organisation may provide a physical infrastructure, the internet and other communication media are ubiquitous and form a 'virtual infrastructure' that can be used in disaster recovery efforts. Disaster recovery teams using this infrastructure often are virtual in nature. In 'In search of trust for newly formed virtual disaster recovery teams,' Altschuller and Benbunan-Fish address the issue of trust among team members. In their paper the authors address how impression formation, public self-awareness, perceived social presence and self-disclosure all correlate with trust. They present the results of an experiment that correlates these variables with trust for teams addressing an ethical dilemma – apropos to crisis management since many decisions made in crises have significant ethical components. Based on their results, they propose various strategies that one may use to build trust in virtual teams so they may operate more effectively in crisis situations.

3 Firm behaviour and business culture

Today no one organisation is an island; rather all firms operate in a web connecting firms with both suppliers and customers. Risk to one become risks to all. Supply chains generate many potential risks due to the disbursed nature of chain participants and the concomitant disbursal of managerial control. With globalisation supply chain participants often are not only geographically disbursed, but also 'culturally disbursed' with differing attitudes to supply chain risk, and strategies for dealing with those risks. Zsidisin *et al.* examine cultural differences between German and US organisations in 'Supply risk perceptions and practices: an exploratory comparison of German and US supply management professionals'. Using a sample of five purchasing organisations (three from the USA and two from Germany), they explore the effects of supply disruption occurrences, differences in how supply risks are perceived by German and US managers, and differences in managerial practices to deal with these risks. While German firms tended to focus on strategies where responsibility was placed on suppliers, US firms tended to rely more on buffers, such as inventory and financial strategies. The authors conclude many organisations may benefit by incorporating cultural differences into the risk management equation.

Business resilience depends upon business being able to operate even when confronted with internal and external disturbances. In 'Managing operational risks in Small and Medium-sized Enterprises (SMEs) engaged in manufacturing – an integrated approach', Islam *et al.* address two research questions: First, they develop a conceptual framework along with working principles regarding how SMEs should manage risks caused by potential internal and external disturbances. They also present the results of an empirical investigation conducted for a sample of New Zealand companies and find that although typical internal and external disturbances may put the SMEs at risk, most firms analysed do not have systematic risk management strategies in place – including the ability to identify and act on root causes.

4 Simulation methodologies

For years computer-based and computer-mediated simulations have been used by managers to answer 'what if' questions and to train personnel. Nowhere is training more necessary than when responding to disasters where decision-makers involved in emergency response efforts must operate in chaotic environments. Simulation modelling with the decision-maker embedded in the simulation is one alternative to repeated real-time emergency exercises, which may be expensive and impractical of implement. In 'Simulation of multi-organisational coordination in emergency response for system resiliency', Kanno *et al.* presents a multi-agent, human-in-the-loop simulator that can be used for emergency response in disaster settings. An XML based simulation model is developed that provides output in the form of a log of interpersonal interactions between participants that helps managers to highlight communication coordination needs, assess the timing and integrity of communications, and also to train human participants by exposing them to various emergency scenarios without actually conducting tests.

Due to the nature of the interdependencies among participants, supply chains are particularly vulnerable to disruptions affecting the participants at different tiers, particularly disruptions due to natural disasters. Miller and Engemann in 'A Monte Carlo simulation model of supply chain risk due to natural disasters' present an Excel-based simulation model to simulate the 'supplier side' of a hypothetical three-tier supply chain. The authors develop a base case for supply chain performance and use this to assess the effectiveness of various strategies such as analysing the effectiveness of implementing disaster recovery plans, and using dual sourcing. From the model results various conclusions are developed to help managers better understand the risks in their own supply chains.

The field of business resiliency and disaster recovery is extensive and growing. The papers in this special issue illustrate its breadth and also highlight the multi-dimensional challenges ahead for both theoreticians and practitioners in the field. In doing so, they provide material on which to continue to build the superstructure of this evolving discipline.