

Chapter 33

Nonparametric Correspondence Analysis of Global Risk Management Techniques

Kenneth David Strang

State University of New York, USA & APPC Research, Australia

ABSTRACT

This study presents 211 program managers that were interviewed from around the globe to explore the nature of the relationship between portfolio risk management and the functional discipline where it was applied. The purpose was to identify multidisciplinary best-practices in light of the recent global crises and natural disasters. Open-ended questions were asked to avoid limiting responses to survey choices as well as to capture emerging routines. The participants were from 15 companies around the world with high annual earnings-per-share (listed on the New York Stock Exchange). A mixed-method design was used, employing correspondence analysis in SPSS to estimate the quality of the relationship between the applied techniques versus industry disciplines. A significant symmetric model of portfolio risk management techniques was plotted, dimensioned by five distinct methods across six functional disciplines. The prototype revealed unexpected relationships such as the use of nonlinear techniques in manufacturing and statistical procedures in the human resource/labor management field.

INTRODUCTION

The recent subprime economic recession, terrorism, floods, tsunamis, nuclear catastrophes, earthquakes and other crises have prompted organizations around the world to better appreciate - and

apply - risk management (Altman, 2009; Hagigi & Sivakumar, 2009; Lin, Hoffman, & Duncan, 2009; Ongena, Tümer-Alkan, & Vermeer, 2011; vanAsselt & Renn, 2011). The recent crises are different from the 1920-1930 depression because now the world has been impacted and there are new concurrent threats: notably global terrorism along with natural disasters. This raises two pertinent

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research questions: have global crises impacted the risk management techniques that experienced practitioners are applying and how do these best-practices relate to the industry disciplines?

The existing literature is out dated with respect to practitioner best-practices that are evolving since the aforementioned global crises. Surveys of applied portfolio risk management indicated there were unique techniques in use across the disciplines and industries (e.g., Cooper, Edgett, & Kleinschmidt, 2002; McNally, Durmusoglu, Calantone, & Harmancioglu, 2009; Christelis, Jappelli, & Padula, 2010; Ghosh, 2010; Hoffmann & Broekhuizen, 2010; Yunker & Melkumian, 2010; Gupta, Inuiguchi, & Mehlawat, 2011; Ongena et al., 2011). However, there are no multidisciplinary models of risk management techniques to inform stakeholders as we typically find in other disciplines (for instance: generally accepted accounting practices, project management body of knowledge, and managerial leadership theories).

Published theory generally lags behind practical innovations, which impedes the advancement of a body of knowledge (Bryde, 2003); thus, researchers periodically need to 'go out' and ask practitioners what is new. Additionally, more research is needed about effective portfolio risk management practices across the disciplines, and this needs to be better structured to help practitioners (Cooper & Edgett, 2008; Kwak & Anbari, 2009). Furthermore, the validity of existing 'portfolio risk management technique' studies needs to be improved (Steuer, Qi, & Hirschberger, 2005; Stracca, 2006; Mills & Patterson, 2009).

One solution that could make a useful contribution to the literature would be to conduct a new survey of preferred risk management techniques that are used in volatile conditions within various disciplines. Paradoxically, surveying risk management practitioners may be complicated because there are numerous quantitative and qualitative techniques which diverge in terminology according to industry and culture (Smith & Fischbacher, 2009; Sperandio & Girard, 2010; Morse & Shive,

2011; Goodwin & Strang, 2012). For example one study cited over 250 distinct portfolio management procedures (Cochran, Cox, Keskinocak, Kharoufeh, & Smith, 2011). Thus it may be difficult to know what to ask practitioners in survey, especially to identify emerging risk management techniques.

If interviews (instead of surveys) were used to gather feedback about portfolio risk management it may be impractical to obtain a sufficient world-wide sample size. While it is possible to electronically collect comments from international participants, qualitative data is not well-suited for analyzing factor relationships. It is not permissible to apply parametric statistical techniques like correlation, principal components analysis or factor analysis to explore relationships within the nominal data that would be used to describe risk management procedures or discipline categories (Gill, Johnson, & Clark, 2010).

STUDY APPROACH

A mixed-method research design is appropriate for collecting and transforming qualitative nominal data in order to analyze factor relationships (Creswell, 2009). One of the drawbacks in comparing two qualitative factors (portfolio risk management technique versus discipline) is that contingency table analysis has limited inferential power. Another shortcoming is that Spearman correlation analysis requires ordinal data (one cannot assert that one disciplinary category is numerically higher than another). Although exploratory factor analysis is not valid for nominal variables, correspondence analysis (CA) is a comparable statistical technique that is ideal for identifying factor relationships in qualitative data and it can produce a plot to illustrate the quality of the associations (Blasius, Greenacre, Groenen, & van de Velden, 2009; Sourial et al., 2010).

Therefore, to implement the above approach, the researchers interviewed a theoretically-

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