SOUTH AFRICAN ACTUARIAL JOURNAL
SAAJ **9** (2009) 95–6

BOOK REVIEW

Stress Testing for Financial Institutions
Edited by D Rosch and H Scheule. Risk Books, London, 2008 (457 pages)

This is the first book to provide a comprehensive guide to stress-testing methods that are relevant for financial institutions. The book is a collection of 17 chapters written by leading industry experts and the intended audience are financial-risk quants, managers and researchers and the regulators of financial institutions. Most of the book focuses on models for stress testing of credit portfolio risk, and there is a particular emphasis on how these models fit within the regulatory framework of the Basel II Accord.

The book is divided into the following five sections:

1. an overview of stress testing frameworks;
2. stress testing for corporate credit risk;
3. stress testing for retail credit risk;
4. stress testing for economic capital; and
5. stress testing for regulatory capital.

Taken on their own, the chapters are concise, focused and readable. The authors have made a clear effort to make the material accessible and relevant to people in industry. The majority of chapters introduce various models and then apply them to empirical data so that their utility can be demonstrated in a practical context. The mathematical rigour of most models is limited to least-squares regression and matrix algebra and it is worth emphasising that important characteristics of a model and results of subsequent data analysis can still be appreciated even if the mathematics are not fully understood.

Many concepts and modelling approaches are repeated throughout the book (in subsequent editions the editors may want to consider expanding their relatively short introduction to discuss how material across various chapters is related). The book states that credit stress testing is an underdeveloped area of research and this could explain why there is a limited range of modelling techniques. One modelling approach that figures prominently across multiple sections in the book uses econometric methods to estimate the probability of default (PD) for a loan portfolio and then uses Monte Carlo simulation to conduct macroeconomic stress testing. Specifically, the approach consists of using

historical default data to estimate the PD using a logit or probit model that is a function of macroeconomic factors (each of which, in turn, is modelled as an autoregressive process). Once regression coefficients are estimated, stress testing is conducted by simulating macroeconomic data or by using the extreme subsets of available historical data. Examples of data sets that are used to demonstrate how these models can be used in practice include Hong Kong mortgage loans (chapter 1) and corporate loan data across a variety of sectors in Germany (chapter 4) and Finland (chapter 5).

Other modelling approaches include: estimating and stress testing credit migration matrices (chapter 3), augmenting the popular CreditRisk+ to include group dependence (chapter 5), using stress tests to design hedges for foreign currency loans (chapter 6) and stress testing banks' credit risk using mixture autoregressive models (chapter 9).

The book also includes a number of chapters that focus on more general issues relating to stress testing. For example, chapter 2 reviews of the shortcomings of value at risk and the need for stress testing, while chapter 7 provides a good survey of issues and modelling approaches to retail loan-portfolio stress testing. The final section features chapters that provide a general discussion of stress testing in the context of the Basel II accord.

Most of this book will be of limited use to people working in related fields. Those interested in a more general survey of stress testing will likely consult literature on market risk, which is a more developed area than stress testing for credit risk. It is worth noting, however, that chapter 12 provides a solid (and generic) overview to copulas.

The editors comment that the manuscript for the book was submitted two days before Lehman Brothers filed for bankruptcy. In light of what transpired, it is likely that there will be an increasing interest in credit stress testing methods and perhaps it will not be long before material in this book is dated. Until then, it should be regarded as a useful reference for practitioners.

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