

In 240 pages, this book provides up-to-date information in such a sensitive business area.

Gustavo A. and Torres G.
*Actuary, Finance and Risk Management
Consultant Member of PRMLA Education &
Standards Committee and Venezuela
Chapter Steering Committee, Coro, Edo.
Falcón, Venezuela*

***Anticipating Correlations: A New
Paradigm for Risk Management*
by Engle Robert**

Princeton University Press, Princeton,
NJ; 2009; ISBN 978-0-691-11641-9;
176pp; hardcover; \$39.50, £28.95

As we begin forensic examination of the wreckage that is conventional risk management, one item that deserves particular scrutiny is the treatment of correlation. Arguably, the escalation of systemic risk at the heart of this crisis has occurred because ‘formerly uncorrelated risks [have] shift[ed] and become highly correlated. When that happens, then insurance and diversification models fail’.¹ More specifically, many blame the constant correlation models used to assess the riskiness of collateralised debt obligations (eg Gaussian Copulas) for the errors that led to the subprime crisis itself. Against this background, Professor Engle’s new book ‘Anticipating Correlations’ is both timely and potentially important. Certainly, this is a well-constructed book that usefully brings together an important and current literature. However, on the basis of the evidence presented, it is hard to see Professor Engle’s approach to anticipating correlations becoming a new paradigm in

risk management as the subtitle of the book suggests. The methods discussed are currently too complex and the gains too small to be worthwhile. It is however a useful reminder that fixed correlations are assumed at one’s peril.

This book summarises the burgeoning literature (led by Professor Engle himself) on the dynamic conditional correlation (DCC) class of models in a way that makes these models accessible to those involved in the financial industry — or at least those at the highly quantitative end of the industry. The basic idea behind DCC is to extend Engle’s hugely influential models of time-varying volatility (ARCH, GARCH etc) into the arena of correlation and so allow estimates and forecasts of time-varying correlation between assets.

The book opens with a nice discussion of the concept of correlation giving concise descriptions of approaches to dependence such as Copulas. Engle also demonstrates how Campbell’s simple variance decomposition approach can be used to describe the forces that act on correlation (although this is rather grandly described as an economic model of correlation, which seems a stretch). This section also highlights a few stylised facts about correlation that bear repeating. For example, the observation that correlation is higher in periods of higher volatility and that even multivariate normal distributions with constant correlation will exhibit this property may be simply a statistical artefact. However, even after allowing for this statistical effect, empirical evidence suggests that correlation in periods of falling returns does seem to be much higher than standard fixed correlation models would suggest.

In the major part of the book, the DCC class of models are discussed. Although it is beyond the scope of this review to go into the technical details, it is quite clear that DCC presents greater technical challenges than volatility models. First, the scale of the problem is huge. Variance is simply the diagonal of the variance-covariance matrix, and co-variances are all the off-diagonals elements; thus, for all but the smallest portfolios, there are significantly more correlations than volatilities to estimate. Secondly, correlation is a trickier statistical concept to deal with than volatility. The upshot of these difficulties is that the models that can be estimated are quite simplistic (almost all impose the restriction that the correlation will return to its historic mean, and enforce the same dynamics across all the correlations being estimated), and even with these simple models, estimation and forecasting are technically challenging.

The final part of the book looks at the empirical performance of these correlation models using an almost ideal sample — one that includes the beginning of the current crisis. It is at this point that the reader realises that DCC is not set to revolutionise risk management (yet). Although DCC generally outperforms constant correlation models, the outperformance

appears unimpressive. For example, for a portfolio of 18 large cap stocks the minimum variance portfolio estimated using constant correlation has a volatility of 25.1 out of sample, while the same portfolio estimated using DCC reduced the out of sample volatility only marginally to 24.9. While this is only one test, the results are hardly what one might hope for from a new paradigm — probably not worth the huge technical effort involved (not least because highly technical models can often inspire over-confidence among their less critical users). Thus, while DCC is clearly a worthwhile research agenda and this book will be of great interest to those that wish to keep up with that agenda, it does not yet seem ready to be incorporated into standard risk management, despite the dire need for a new approach to correlation.

Francis Breedon

Imperial College Business School, London

Reference

- 1 Spence, A. M. (2008) PIMCO Viewpoints, November, available at: www.pimco.com/LeftNav/Viewpoints/2008/Viewpoints+Lessons+from+the+Crisis+Spence+November+2008.htm (accessed 19th June, 2009).

Copyright of *Journal of Risk Management in Financial Institutions* is the property of Henry Stewart Publications LLP and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.