Market Models: A Guide to Financial Data Analysis By Carol Alexander

Market Models describes financial market models as used by investment risk managers and investment analysts. Author Carol Alexander set out to create a text that balances theory and practice; builds a bridge between the academic and practitioner. In doing so, Professor Alexander has also attempted to create a book that is "self-contained."

She has succeeded, as Market Models is indeed self-contained. A CD-ROM with detailed examples, graphs, and spreadsheets providing hands-on experience to compliment the text accompanies the book. The book also contains excellent detailed technical appendices (six of them) covering the statistical theory and methods underpinning the finance in the text. The appendices include topics such as regression analysis, statistical inference, and maximum likelihood estimation.

Be forewarned, Market Models is not an easy read, nor is it without its prerequisites. This is a graduate or advanced undergraduate level textbook on a specific field of finance. It presumes knowledge of calculus, linear algebra, probability and statistics, regression, time series, and finance. Actuaries will feel almost universally comfortable with the math, in some cases even finding it simple. The same may not be true for the finance. Readers will need to be current with the finance readings on the current Part 8 syllabus (e.g., Elton & Gruber's Modern Portfolio Theory or Investments by Bodie, Kane & Marcus or the old Part 9 (such as Brealey & Myers Principles of Corporate Finance).

Market Models is written in three parts, plus the technical appendices mentioned above. Part One covers correlation analysis and volatility. Part Two is on modeling the market risk of portfolios. Part Three covers statistical models of financial markets. A brief discussion of each of the three parts follows below.

Part I, Volatility and Correlation Analysis (Chapters 1-5), covers the pricing and hedging of options from the perspective of understanding the underlying concepts of volatility and correlation. Consistent with the more general comments above, actuaries will find the basic discussion of topics such as variance and correlation elementary. It's a slippery slope, however, as Professor Alexander then dives right into options pricing, "smiles," hedging and the like. Prior exposure to options and Black-Scholes is very helpful. The remainder of Part I, the bulk of it, is devoted to applied models of volatility and correlation, such as moving average and GARCH (generalized autoregressive conditional heteroscedasticity) models. The author's chapter on GARCH models could be the poster child for the text as a whole: here is an area with an enormous amount of academic research over the last decade, but one that has found relatively little practical application. Alexander does a credible job of wading through the research for us, culling out the relevant theory, and presenting models with a practical bent.

Part II, Modeling the Market Risk of Portfolios (Chapters 6-10), includes an excellent chapter on the use of principal components to identify a few key independent variables, and their relative importance, for a portfolio model. (Dust off your linear algebra; you'll need it to calculate Eigenvalues.) There are also chapters on more familiar subjects such

as portfolio analysis employing variance-covariance matrices, and factor models (e.g., CAPM). Value at risk (VaR) is also presented in a nice section relating VaR to past and current Basel regulations, along with a discussion of coherent risk measures and alternative risk measures.

Part III, Statistical Models for Financial Markets (Chapters 11-13), covers the econometric approach to modeling relationships between financial asset prices. Part III is made up of three chapters: time series (Chapter 11), cointegration (Chapter 12), and modeling high frequency data (Chapter 13). Actuaries will likely be familiar with the time series models, whereas cointegration is probably new ground. Cointegration refers to co-movements in asset prices, and cointegration models are essentially multivariate time series models. Like GARCH models, cointegration is on the bleeding edge of finance, and Alexander again does a good job balancing theory and practice. In regard to cointegration, the author states, "It is unfortunate that many market practitioners still base their analysis on the relationships between markets on the very limited concept of correlation." The final chapter, "Forecasting High Frequency Data," is again on the leading edge, debunking efficient market hypotheses and crossing into neural networks and chaos.

In the end, this text hits its mark. It is self-contained yet strikes a good balance between theory and practice – especially if you're a practicing investment professional. For the rest of us, it's interesting and thought provoking…and a little heady.