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Book reviews

Advances in Econometrics, Econometric Analysis of Financial and Economic Time Series, Deck Terrell, Thomas B. Fomby (Eds.), Vol. 20, Part A. JAI Press, (2006), 379 pp., Part A, ISBN: 0-7623-1274-2

In recent years, newly developed time series econometric techniques have enhanced the literature in both academia and industry. This rapid expansion in the literature is attributed to the proliferation of *financial* time series data, which often have different characteristics from *economic* time series data. Consequently, modeling financial time series data has proven to be complex, and has required the development of models which can explain the behavior of the underlying variables. *Advances in Econometrics, Econometric Analysis of Financial and Economic Time Series (Volume 20)* contains two volumes.

This review discusses part A, which is divided into three parts, each presenting papers with a central theme of econometric analysis of the financial and economic time series models: including multivariate volatility models, high frequency volatility models, and univariate volatility models. Before delving into the papers of this volume, the editors present remarks by Sir Clive Granger and Robert Engle about the role of innovation in econometric theory and practice at the Third Annual Advances in Econometrics Conference at Louisiana State University in November 2004. The papers contributed in this volume provide a sense of the latest advances in the econometric analysis of financial and economic time series.

Baur's paper, "Multivariate Volatility Models: A Flexible Dynamic Correlation Model," discusses the multivariate GARCH models developed by Baba, Engle, Kroner, and Kraft (1991), known as BEKK. The existing multivariate GARCH models such as BEKK either impose strong restrictions on the parameters or do not guarantee a well-defined (positive definite) covariance matrix. The BEKK model shows that the covariance and the correlation are not adequately specified under certain conditions, implying that any analysis of the persistence and the asymmetry of the correlation are difficult and potentially inaccurate. As a remedy, Baur proposes a Flexible Dynamic Correlation (FDC) model that parameterizes the conditional correlation directly, and eliminates various shortcomings of the existing multivariate GARCH models.

"A Multivariate Skew GARCH Model," prepared by DeLuca, Genton and Loperfido, allows for the GARCH model to take into account the heteroscedasticity of the financial time series, but their approach allows the distribution of the European returns to be skewed conditionally on news (one day lag of US returns). The authors propose a multivariate Skew-GARCH model, which is a generalization of the GARCH model aimed at describing the behavior of a vector of non independent financial returns when an exogenous shock coming from a leading financial market is incorporated into the model. They empirically analyze returns from three European markets, with the US being the leading market. Based on their empirical results, the authors conclude that it is important to consider the effects of the exogenous shock on the development of such GARCH models.

The Hafner, Van Dijk, and Franses paper, "Semiparametric Modeling of Correlation Dynamics," develops a semiparametric model which combines the parametric GARCH model for asset volatility with a nonparametric regression for conditional correlations. Multivariate volatility models for financial asset returns usually contain many unknown parameters, which hampers their empirical application. The literature puts forward various models that somehow impose structure on these models in order to make estimation feasible. In their paper, the authors argue that these structures are often too restrictive; therefore, they propose a new flexible, semi-parametric variation of the model.

Politis, in his paper, "A Multivariate Heavy-tailed Distribution for ARCH/GARCH Residuals," develops a modified ARCH/GARCH model motivated by the observation that the residuals from standard GARCH models often do not follow a normal distribution. As for the multivariate GARCH model, his analysis determines that maximum likelihood estimation (MLE) should be applied to the model to allow the residuals to follow a normal distribution. Given the preliminary development of such analytical methods, future research becomes necessary to derive a likelihood approach for the standard errors and confidence intervals.

"A Portmanteau Test for Multivariate GARCH When the Conditional Means in ECM: Theory and Empirical Applications", prepared by Sin, establishes that a portmanteau test of the squared residuals is asymptotically normal even if the conditional mean is an error-correction model. The author applies this approach to the Nelson and Plosser datasets. The empirical results show that the results obtained with the error-correction model can be sensitive to the inclusion of GARCH effects.

In the next series, the editors provide papers related to the theme of high frequency data. The first paper, which is by Andreou and Ghysels, "Sampling Frequency and Window Length Tradeoff in Data-driven Volatility Estimation: Appraising the Accuracy of Asymptotic Approximation," examines how empirical volatility estimates depend on the sampling frequency and window length. Furthermore, the authors examine these effects using monthly, daily, and intraday observations, using a continuous time stochastic volatility model.

In their paper, "Model-based Measurement of Actual Volatility in High Frequency Data," Jungbacker and Koopman examine the measurement of volatility in the presence of microstructure noise. Their aim is to measure actual volatility within a model-based framework using high-frequency data. In the empirical finance literature it is known that tick-by-tick prices are subject to market microstructure noise such as bid–ask bounces and trade information. Such microstructure effects become more and more apparent as prices or returns are sampled at smaller and smaller time intervals. From their analysis, models with microstructure noise lead to lower volatility estimates than models without microstructure noise.

"Noise Reduced Realized Volatility: A Kalman Filter Approach," a paper by Owens and Steigenwald, also examines the issue of microstructure noise. Their analysis demonstrates that microstructure noise distorts estimates of asset price volatility. Typically, high frequency observations such as intraday data are given the same weight, which does not provide efficient empirical results. As a remedy, a Kalman filter is applied to obtain the weights of the high frequency data, and the application of the Kalman filter for obtaining the weights is shown to lead to improved empirical estimates. They also demonstrate the efficacy of their procedure through simulations, showing that their filter compares favorably to other, more traditional methods.

Part Three presents papers with the central theme of univariate volatility models. Typically, stochastic volatility models have stochastic second moments, and those models that do not have a stochastic second moment are called stochastic volatility models. Chou introduces the Asymmetric Conditional Autoregressive Range (ACARR) in his paper, "Modeling the Asymmetry of Stock Movements using Price Ranges." This paper focuses on the asymmetry of financial data, and ACARR provides a new framework for analyzing the asymmetry of price movements in financial markets. In fact, ACARR can be used to compute option prices where the upward (downward) range (or the maximum/minimum return) is more relevant for the price of a call (put) option.

The stochastic volatility models are based on elegant theoretical foundations; however, the empirical implementation of these models is often cumbersome. Dufour and Valery in their paper, "On a Simple Two-stage Closed-form Estimator for a Stochastic Volatility in a General Linear Regression," present an empirically feasible approach to estimating stochastic volatility models. They develop a simple two-step estimation procedure: the conditional mean model is first estimated using a simple consistent procedure that takes into account the stochastic volatility structure; then, using residuals from this preliminary regression, the parameters of the stochastic model are then evaluated using a method-of-moment estimator based on three moments (2S-3M), from which a simple closed-form expression can be derived. Under general regularity conditions, they show that the two-stage estimator is asymptotically normally distributed.

The paper by Heracleous and Spanos, “The Student’s T Dynamic Linear Regression: Re-examining Volatility Modeling,” provides an alternative volatility model. The St-DLR model with dynamic heteroscedasticity is an alternative to the numerous extensions/modifications of the ARCH type volatility model. In fact, Spanos derives a new family of linear/heteroskedastic regressions using a Student’s t distribution. Additionally, when the i.i.d. assumption is replaced by Markov dependence and stationarity, a new family of ARCH formulated models emerges. This paper represents these efforts and provides an empirical application of these new methods.

The paper, “ARCH Models for Multi-period Forecast Uncertainty: A Reality Check Using a Panel of Density Forecasts,” prepared by Lahiri and Liu, examines the determinants of inflation forecast uncertainty using a panel of density forecasts from the Survey of Professional Forecasters (SPF). Based on a dynamic heterogeneous panel data model, they find that the persistence in forecast uncertainty is much less than is implied by aggregate time series models. In addition, the strong link between past forecast errors and current forecast uncertainty, as often noted in the ARCH literature, is lost in a multi-period context with variations in the forecast horizons.

In the final paper of this volume, “Necessary and Sufficient Restrictions for Existence of a Unique Fourth Moment of a Univariate GARCH (p,q) Process,” by Zadrozny, a univariate GARCH (p,q) process is transformed to a univariate autoregressive moving-average process in squares of an underlying variable. For a positive integer *m*, eigenvalue restrictions have been proposed as necessary and sufficient restrictions for the existence of a unique m^{th} moment of the output of a univariate GARCH process. However, previous proofs in the literature are often incorrect, incomplete, or unnecessarily long. Thus, this paper provides a short and general proof that an eigenvalue restriction is necessary and sufficient for the existence of a unique 4th moment of an underlying variable of a univariate GARCH process. The paper then discusses providing an expression for computing the 4th moment in terms of the GARCH parameters. Because the inequality restriction is easily computed using the GARCH parameters without eignenvalues, the authors provide an easy method for computing the fourth moment by hand, and for checking whether it exists in the case of low-dimensional GARCH processes.

This volume provides modern advances in the analytical and empirical methods of financial and economic time series. In conjunction with the *Advances in Econometrics, Part B*, these papers provide applied econometricians with a means for quickly learning new econometric techniques that otherwise could only have been read in the various econometrics journals. The main drawback of this volume is the lack of presentation of the code and/or software programs used to prepare the empirical estimates. If such computer programs were provided, readers would be able to replicate or even apply these newly vintaged methods to their current research. The editors of volume A have maintained the tradition of presenting papers that are in sufficient detail to enable applied and theoretical researchers who are not familiar with these methods to use them in their own research. The volume is also rather timely, since the demand for empirical analyses of financial time series is increasing as financial markets become more complex. For those researchers interested in economic and financial time series models, I would recommend this volume as a comprehensive, focused and up-to-date approach to such methods.

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Expert political judgment: How good is it? How can we know? P.E. Tetlock, Princeton University Press, (2006), Paperback, 352 pp., ISBN: 978-0-691-12871-9

Author: Philip E. Tetlock is a psychologist who is Professor of Leadership at the Haas School of Business at the University of California, Berkeley. The book combines several of his research interests, such as how experts learn (or not) from experience, and how to de-bias judgment and choice to overcome common cognitive biases such as belief perseverance and overconfidence. In 2005 the American Political Science