Alejandro Federico Rodriguez

Curriculum Vitae

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Education

- 2006-2009: Ph.D., Business Administration and Quantitative Methods. (Expected: March, 2010) Universidad Carlos III de Madrid, Getafe, Madrid Dissertation: "Topics in Models with Unobserved Components: Bootstrap Forecast and Conditional Heteroscedasticity".
- 2006: M.A., Business Administration and Quantitative Methods Universidad Carlos III de Madrid, Getafe, Madrid
- 2001: B.A., Economics Universidad Nacional de Cordoba (UNC), Córdoba, Argentina

Research

• Publications

- 2009: "Bootstrap Prediction Intervals in State Space Models". Journal of Time Series Analysis, Vol 30, 167-178. (With Esther Ruiz).
- 2003: "A Parametric Estimation of Personal Income Distribution in Argentina Using the Dagum Model". Special Issue of the Journal of the Inter-American Statistical Institute (IASI), "Estadística" Volume 55, Numbers 164-165. (With H. Gertel, R. Giuliodori and P. Auerbach).

• Article in edited books

2008: Analysis of the Short Term Impact of the Argentine Social Assistance Program 'Plan Jefes y Jefas' on Income Inequality Applying the Dagum Decomposition Analysis of the Gini Ratio, in Gianni Betti and Achille Lemmi (eds.), Advances on Income Inequality and Concentration Measures, Routledge, UK. (With H. Gertel and R. Giuliodori)

• Working papers

- (Job Market paper) "Bootstrap prediction mean squared errors of unobserved states based on the Kalman filter with estimated parameters", (2009). (With Esther Ruiz).
- "Bootstrapping Stochastic Volatility Processes", (2009). (With Esther Ruiz).
- "La contribución de la educación y la diferenciación por sexo en las medidas de desigualdad del ingreso", 2003. (With H. Gertel and R. Giuliodori).
- "Un ejercicio de descomposición del Coeficiente de Gini para la distribución del ingreso entre poblaciones con diferente nivel de escolaridad de Argentina. Año 2002", 2002. (With H. Gertel and R. Giuliodori).
- "Does Schooling Contribute to Increase Individuals' Chances to Access The More Affluent Income Groups?", 2002.(With H. Gertel and R. Giuliodori).
- "Evaluating equality using parametric income Distribution models. An exploration of alternative effects using a Dagun Parametric income distribution model", 2001. (With H. Gertel, R. Giuliodori and P. Auerbach).

• Works in progress

 "Determining the source of Heteroscedasticity in Conditional Heteroscedasticity Unobserved Component Models".

Professional Experience

- 2004-2009: Teaching Assistant. Department of Statistic. Universidad Carlos III de Madrid. Madrid, Spain.

Graduate Courses: Financial Econometrics (2007-2008-2009). Econometrics (Microeconometrics) (2009). *Undergraduate Courses*: Econometrics II (2006-2007, 2007-2008 and 2008-2009). Statistics for Business (2005-2006). Statistics III (2005-2006). Statistics Applied to Social Sciences (2004). Design of Experiment (2004).

- 2009: Econometric Consultant. e-konomica Consultant. Project: Demand Estimation.
- 2009: Instructor. Course on time series, Escuela de metodología y análisis sociopolítico (EMAS), Universidad de Salamanca, (10 hours). (with Prof. Ana Perez)
- 2006-2008: Instructor. Training course on statistics and business using MatLab (9 hours). Master in Business Management and Quantitative Methods, Universidad Carlos III de Madrid. (With Prof. Santiago Pellegrini).
- 2008: Econometric Consultant. e-konomica Consultant. Project: Market analysis, vertical integration.
- 2007: Instructor. Training course on Financial times series using MatLab (6 hours). Master in Statistics, Universidad Nacional de Córdoba, Argentina. (With Prof. Santiago Pellegrini).
- **2005**: Econometric Consultant. Acciona Energía. Project: Developing a programming for forecasting values of the production of electricity in a river-electric power station.
- 2002-2004: Coordinator-Analyst of the Permanent Household Survey (Encuesta Permanente de Hogares-EPH). Bureau of Statistics and Censuses, Government of the Province of Cordoba, Argentina. Assignment: Manage 20 persons and in charge of calculate the unemployment rate, poverty indicator, education indicators, among others.
- 2002: Instructor. National Institute of Statistics and Censuses (INDEC). Córdoba (Argentina). Training course, Permanent Household Survey.
- 2000-2004: Research Assistant. Institute of Economy and Finances at the Universidad Nacional de Córdoba, Argentina.

Fellowships

- 2006-: TA. Department of Statistics, Universidad Carlos III de Madrid. .
- **2004-2006**: Ph.D. Scholarship. Universidad Carlos III de Madrid. Madrid.
- 2002-2004: Postgraduate Scholarship. Secretaría de Ciencia y Tecnología, Universidad Nacional de Córdona, Argentina.

Other Skills

- Laguage: Spanish (Native). English (Fluent).
- MatLab, EViews, Stata, Microsoft Visual Basic, LaTex, Microsoft Office.

References

Prof. Esther Ruiz Ortega Universidad Carlos III de Madrid e-mail: ortega@est-econ.uc3m.es Phone: +34 91 6249851 Prof. Antoni Espasa Universidad Carlos III de Madrid e-mail: espasa@est-econ.uc3m.es Phone: +34 91 6249803/89 Prof. Juan José Romo Urroz Universidad Carlos III de Madrid e-mail: romo@est-econ.uc3m.es Phone: +34 91 6249805

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Abstracts

Bootstrap prediction mean squared errors of unobserved states based on the Kalman filter with estimated parameters (with Esther Ruiz)

Abstract

In the context of linear state space models with Gaussian errors and known parameters, the Kalman filter generates best linear unbiased predictions of the underlying components together with their corresponding prediction mean squared errors (PMSE). However, in practice, the filter is run by substituting some parameters of the model by consistent estimates. In these circumstances, the PMSEs obtained from the filter do not take into account the parameter uncertainty and, consequently, they underestimate the true PMSEs. In this paper, we propose two new bootstrap procedures to obtain PMSE of the unobserved states based on obtaining replicates of the underlying states conditional on the information available at each moment of time. By conditioning on the available information, we simplify the procedure with respect to alternative bootstrap proposals previously available in the literature. Furthermore, we show that the new procedures proposed in this paper have better finite sample properties than their alternatives. To illustrate the results we implement the proposed procedure for estimating the PMSE of the several key unobservable US macroeconomic variables, i.e. the output gap, the non accelerating inflation rate of unemployment (NAIRU), the core inflation and the long-run investment rate. In particular, we will analyze how taking into account the parameter uncertainty may change the prediction intervals constructed for those unobservable macroeconomic variables.

Bootstrap Prediction Intervals in State-Space Models (with Esther Ruiz)

Abstract

Prediction intervals in State Space models can be obtained by assuming Gaussian innovations and using the prediction equations of the Kalman filter with the true parameters substituted by consistent estimates. This approach has two limitations. First, it does not incorporate the uncertainty due to parameter estimation. Second, the Gaussianity of future innovations assumption may be inaccurate. To overcome these drawbacks, Wall and Stoffer (2002) propose a bootstrap procedure to evaluating conditional forecast errors that requires the backward representation of the model. Obtaining this representation increases the complexity of the procedure for constructing prediction intervals directly for the observations, which does not need the backward representation of the model. Consequently, its application is much simpler, without loosing the good behavior of bootstrap prediction intervals. We study its finite sample properties and compare them with those of the standard and the Wall and Stoffer (2002) procedures for the Local Level Model. Finally, we illustrate the results by implementing the new procedure to obtain prediction intervals for future values of a real time series.

Bootstrapping Stochastic Volatility Processes (with Esther Ruiz)

Abstract

When fitting unobserved component models to represent the dynamic evolution of time series, it is often of interest to obtain predictions of the series but also of future values of the underlying unobserved components. Many financial models need predictions, of both future returns and volatilities. Prediction of these variables is one of the main objectives when Stochastic Volatility (SV) models are fitted. However, parameters of the model are substituted by consistent estimates. Consequently, prediction intervals that do not incorporate the uncertainty caused by the estimation, in general, underestimate the variability of the forecasting error. A first step of incorporating the uncertainty caused by estimation in the unobservable state is the paper of Pfefferman and Tiller (2005). They propose a procedure for estimating the mean square error (MSE) associated with the one-step ahead predictor of the state vector. However, they do not apply this procedure for constructing prediction intervals of the underlying state. In this work, we propose a bootstrap procedure for estimating prediction densities of future returns and volatilities and consequently, prediction intervals that incorporate the uncertainty caused by the estimation of parameters and the unobserved volatility. In addition, the procedure does not rely on specific assumptions about the distribution of the standardized returns. The procedure gives also as a byproduct estimates of the corresponding value at risk (VaR).

Determining the source of Heteroscedasticity in Conditional Heteroscedasticity Unobserved Component Models (with Esther Ruiz)

Abstract

Nowadays, it is well accepted that the uncertainty in several macroeconomics series evolves over time; for example Stock and Watson (2007) have proposed a model for monthly inflation in US where the longrun component is heteroscedastic. In general, the uncertainty of economic time series may come from a short or a long run component. Distinguishing the source of the heteroscedasticity may have important consequences when forecasting values of the series and consequently, for policy recommendations; Pellegrini et al. (2007). Broto and Ruiz (2009) show that using the difference between the autocorrelations of the squared auxiliary residuals and the square of the autocorrelation of the auxiliary residuals, it is possible to increase the power of the homoscedasticity test with respect to use the original series or the innovations of the estimated model. However the difference of the autocorrelations of the auxiliary residuals may have some limitations caused by transmission of volatility between them. In this work, we propose a procedure to identify conditional heteroscedasticity in the components that overcome the problems of the Broto and Ruiz (2009)'s procedure.