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EDUCATION

Diploma in Mathematics, (with Distinction) Lomonosov Moscow State University, 2002.

M.A. in Economics, New Economic School, Moscow, 2004.

Ph.D. in Economics, University Carlos III de Madrid, 2010 (expected).

Thesis Title: *Specification Tests for Financial Models*.

TEACHING AND RESEARCH FIELDS

Primary fields: Econometrics, Financial Econometrics

Secondary fields: Macroeconomics, Empirical Finance

PH.D. THESIS ADVISOR AND REFERENCES

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OTHER INFORMATION

Languages: English, Spanish, Russian

Software: C/C++, Visual Basic & VBA, Matlab, Gauss, Stata, Eviews

RESEARCH PAPERS

Specification Tests for Nonlinear Time Series Models

This paper proposes a new model adequacy test for parametric conditional distributions in nonlinear time series models. These tests are necessary to justify efficient maximum likelihood estimation, to estimate intensity in duration models and downside risk in risk-management, especially on nonlinear portfolios. It can serve also as a density forecast evaluation tool. Uniformity and independence of series obtained by applying the conditional probability integral transform are simultaneously checked by means of continuous functionals of a biparameter process of contemporaneous and lagged transforms. Weak convergence of the empirical process under parameter uncertainty is established. The test has power against local alternatives converging under the null with a parametric rate and solves consistency problems of previous single parameter tests. We justify a parametric bootstrap approximation that accounts for parameter estimation effects. The test analyzed is extended in two directions: higher order joint distributions and more lags are considered. An explicit formula to compute test statistics without numerical integration is derived. Monte Carlo experiments show that the test has a good power against many different alternatives, both in linear and nonlinear dynamic models. Adequacy of various heteroscedastic models for stock exchange index data is checked.

Model Adequacy Check for Data with Discrete Components, with Carlos Velasco

This paper proposes new parametric model adequacy tests for possibly nonlinear time series models with noncontinuous data distribution, which is often the case in applied work. In particular, we consider the correct specification of the parametric conditional distributions in dynamic discrete choice models. Knowing the true distribution is important in many circumstances, in particular to apply efficient maximum likelihood methods, obtain consistent estimates of partial effects and appropriate predictions of the probability of future events. We propose a transformation of data which under the true conditional distribution brings to continuous uniform i.i.d. series. The transformation can be considered as an extension of the integral transform tool for noncontinuous data. We derive asymptotic properties of such tests taking into account parameter estimation effect. Since transformed series are i.i.d. we do not require any mixing conditions and asymptotic results illustrate the double simultaneous checking nature of our test. The test statistics converges under the null with a parametric rate to asymptotic distribution, which is case dependent; hence we justify a parametric bootstrap approximation. The test has power against local alternatives and is consistent. The performance of the new tests is compared with classical specification checks for discrete choice models and these are applied to the investigation of the specification of the monetary policy rule of the Federal Reserve.

PAST RESEARCH

I. L. Kheifets, "Extension theorem for linear codes over finite quasi-Frobenius modules", *Fundam. Prikl. Mat.*, 7:4 (2001), 1227–1236 (in Russian)