Atami-Seminar (2011/3/3 – 2011/3/4)

Organizer: Taniguchi, M. (Waseda University)

At   Atami – New Fujiya-Hotel

March, 3： １３：３０－１７：００

(0)   Taniguchi, M.(Waseda Univ.)   Opening

(1) Dong, Wei Ye, Hamada, Taniguchi, M.(Waseda Univ.)   Statistical portfolio estimation under the utility function depending on exogeneous variables.

(2) Kato, K., Amano, T. and Taniguchi, M.(waseda Univ.) Statistical estimation for CAPM with long memory dependence.

(3)   Chen, C. W. S.[1], Gerlach, R. H.[2], Lin, EMH[1], Lee, W.[1] ((1)Feng Chia University(2)University of Sydney) Bayesian Forecasting for Financial Risk Management, Pre and Post the Global Financial Crisis.

(4) Ogata, H.(Tokyo Metropolitan Univ.)   Estimation for multivariate stable distributions

(5)   Paindaveine, D. (Univ. Libre de Bruxelles) Depth-based runs tests for multivariate central symmetry

(6) Amano, T. (Waseda Univ.) Empirical likelihood approach to discriminant analysis for stationary processes

(7) Tamaki, K. (Waseda University) Higher Order Asymptotic Bond Option Valuation for Interest Rates with non-Gaussian Dependent Innovations

(8) Yao, Q. (London School of Economics)   Stepwise searching for feature variables in high-dimensional linear regression.

(9) Taniai, H, (Waseda Univ.)   A Topic on Regression Quantile Processes

(10) Cheng, M. Y.   (National Taiwan University)   Adapting to Sparse Design in Multivariate Local Linear Regression.

March 4： 9 ： 0 0 － 1 2 ： 0 0

(11) DiCiccio,T. (Cornell Univ.) Comparing the efficacies of transformations for variance stabilization

(12) Hirukawa, J. (Niigata Univ.) Asymptotic properties of non-linear and long memory process

(13) Lee S. (Seoul National University) Robust estimation in time series models based on minimum density power divergence

(14) Solvang Kato, H. (Institute of Cancer, Oslo) An integrated approach for causal association among gene expression, genotype variation and chronic fatigue

(15) Dette, H. (Univ. Ruhr) Testing for stationarity in locally stationary processes

(16) Alex Petkovic (Waseda Univ.) Linear Regression with Deterministic Regressors and Unit Root in the Variance

(17) Hallin, M. (Univ. Libre de Bruxelles) Skew-symmetric distributions and Fisher information − A tale of two densities

(1)Statistical portfolio estimation under the utility function depending on exogeneous variables

Dong, Wei Ye, Hamada, K. and Taniguchi, M. (Waseda University)

ABSTRACT
In the estimation of portfolios, it is natural to assume that the utility function depends on exogenous variable.From this point of view, in this paper, we develop the estimation under the utility function depending on exogenous variable. To estimate the optimal portfolio, we introduce a function consists of mean and variance of the return process, the covariance of the return processes and the exogenous variable, the 3-rd cumulant of the return process and the exogenous variable. Assuming that exogenous variable is a random process, we derive the asymptotic distribution of sample portfolio.Then, the influence of exogenous variable on the return process is illuminated when exogenous variable has a shot noise in the frequency domain. Assuming that exogenous variable is a sequence non-stochastic, we derive the asymptotic distribution of sample portfolio. Then, the influence of exogenous variable on the return process is illuminated when exogenous variable has a harmonic trend. We evaluate the influences of exogenous variable on return process numerically.

(2)Statistical estimation for CAPM with long memory dependence

Kato, K., Amano, T. and Taniguchi, M. (Waseda University)

ABSTRACT
In this paper we investigate Capital Asser Pricing Model (CAPM) with time
dimension. By using time series analysis, we discuss the estimation of
CAPM in the case when market portfolio and the error process are long
memory process and correlated each other. We give sufficient condition that
the return of assets in the CAPM is short-memory. In this setting, we
propose a two-stage least squares estimator for the regression coefficient,
and derive the asymptotic distribution. Some numerical studies will de given.
They show an interesting feature of this model.

(3) Bayesian Forecasting for Financial Risk Management, Pre and Post the Global Financial Crisis

Chen, C. W. S.[1], Gerlach, R. H.[2], Lin, EMH[1], Lee, W.[1]
((1)Feng Chia University, Taiwan.Email: chenws@fcu.edu.tw)
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ABSTRACT

Value-at-Risk (VaR) forecasting via a computational Bayesian framework is considered. A range of parametric models are compared, including standard, threshold nonlinear and Markov switching GARCH specifications, plus standard and nonlinear stochastic volatility models, most considering four error probability distributions: Gaussian, Student-t, skewed-t and generalized error distribution. Adaptive Markov chain Monte Carlo methods are employed in estimation and forecasting. A portfolio of four Asia-Pacific stock markets is considered. Two forecasting periods are evaluated in light of the recent global financial crisis. Results reveal that: (i) GARCH models out-performed stochastic volatility models in almost all cases; (ii) asymmetric volatility models were clearly favoured pre-crisis; while at the 1% level during and post-crisis, for a 1 day horizon, models with skewed-t errors ranked best, while IGARCH models were favoured at the 5% level; (iii) all models forecasted VaR less accurately and anti-conservatively post-crisis.

(4)Estimation for multivariate stable distributions

Hiroaki Ogata (Tokyo Metropolitan University)

ABSTRACT

We consider the generalized empirical likelihood (GEL) for the estimation problem of the multivariate stable distributions. The GEL is considered as the generalization of the generalized method of moments (GMM). The multivariate stable distributions are very general as they can describe the skewness and heavy tails. We treat the spectral measure, which summarizes scale and asymmetry, by descretization. In order to estimate all the parameters, we use the estimating function constructed by empirical and theoretical characteristic functions. Monte Carlo studies support the theoretical result, and the illustration to the market index reveals interesting feature among them.

(5)Depth-based runs tests for multivariate central symmetry

Paindaveine, Davy and Christophe Ley (Universit¥'{e} Libre de Bruxelles)

ABSTRACT

McWilliams (1990) introduced a simple nonparametric procedure based on runs for the problem of testing univariate symmetry about the origin (equivalently, about a specified center). His procedure first orders the observations according to their ab- solute values, then rejects the null when the number of runs in the resulting series of signs is too small. This test is universally consistent and enjoys nice robustness properties, but is unfortunately limited to the univariate setup. In this paper, we extend McWilliams・procedure into tests of multivariate central symmetry (still about the origin or a specified center). The proposed tests first reorder the observations according to their statistical depth in a symmetrized version of the sample, then reject the null when an original concept of simplicial runs in the resulting series of (spatial) signs is too small. We show that these tests are affine-invariant and derive their limiting null distribution. We study their finite-sample powers and robustness properties through Monte Carlo simulations.

(6)Empirical likelihood approach to discriminant analysis for stationary processes

Tomoyuki Amano (Waseda University)

ABSTRACT

Empirical likelihood is a non-parametric method and it does not need the knowledge of the distribution which the data comes from and it is widely used. However this method is not usually applied to discriminant analysis. Hence we shall apply this method to discriminant analysis and propose an empirical discriminant function. Then we prove its consistency, which means misclassification probability converges to 0. Furthermore under contiguous hypotheses the limit of its misclassification probability is derived and its lowerbound is obtained. We also evaluate its properties by some statistical methods and its interesting features are obtained by simulation.

(7)Higher Order Asymptotic Bond Option Valuation for Interest Rates with non-Gaussian Dependent Innovations

Shibukawa, T. (Tokyo University of Science), Tamaki, K. (Waseda University) and Shiohama, T. (Tokyo University of Science)

ABSTRACT

We propose an approach to find an approximate bond option pricing formula when the dynamics of short rates have non-Gaussian and dependent innovations. Higher order asymptotic theory enables us to evaluate the pricing of bond options. Numerical illustrations show that the effects of non-Gaussianity and dependency of short rates have a great influence on the bound option prices.

(8)Stepwise Searching for Feature Variables in High-Dimensional Linear Regression

Yao, Q. (London School of Economics)

ABSTRACT

We investigate the classical stepwise forward and backward search methods for selecting sparse models in the context of linear regression with the number of candidate variables p greater than the number of observations n. Two types of new information criteria BICP and BICC are proposed to serve as the stopping rules in the stepwise searches, since the traditional information criteria such as BIC and AIC are designed for the cases with p < n, and may fail spectacularly when p is close to or greater than n. The proposed methods are illustrated in a simulation study which indicates that the new methods outperform a counterpart LASSO selector with a penalty parameter set at a fixed value. The consistency of the stepwise search is investigated when both n and p tend to infinity. We show that a stepwise forward addition followed by a stepwise backward deletion, both controlled by a version of BICP, leads to a consistent estimated model under the sparse Riesz condition.

(9)A Topic on Regression Quantile Processes

Hiroyuki Taniai (Waseda University)

ABSTRACT

In this talk, we observe the regression quantile process, a process of Quantile Regression (QR) estimators indexed by the probability values of interest, in view of the marked empirical process (cf. Stute (1997, Ann. Statist. Vol.25) and Escanciano (2007, Statist. Sinica Vol.17). There it will be emphasized that the QR method is of a semiparametric nature. Then, some of its implications will be discussed, such as residual empirical processes of several parametric models and perhaps some issues on semiparametric efficiency.

(10) Adapting to Sparse Design in Multivariate Local Linear Regression

Cheng, M.Y.   (National Taiwan University)

Abstract: Local linear regression enjoys many nice theoretical properties such as automatic boundary correction and linear minimax optimality, and has become very popular in applications. In finite sample cases, the local least squares problem in local linear estimation becomes ill-posed when the design is sparse and, as a result, the local linear estimator either does not exist or exhibits drastic roughness in the sparse design regions. Many methods have been proposed to address this serious problem in the univariate case, however, they all require extra tuning parameters. We propose a new method to tackle this problem in general multivariate case and discuss in detail the univariate and the bivariate cases. The method is computationally simple and does not involve any extra tuning parameters. We show that the finite sample variance of the modified local linear estimator is bounded above. We further show that it has the same asymptotic mean squared error as the original local linear estimator. Numerical studies demonstrate that it has very good finite sample performance.

(11)Comparing the efficacies of transformations for variance stabilization

DiCiccio, T. (Cornell Univ.)

ABSTRACT
Variance-stabilizing transformations have been shown to be useful for improving the accuracy of inferences for a scalar parameter in both parametric and nonparametric contexts. However, in parametric models with nuisance parameters and in nonparametric contexts, it can be difficult to assess the efficacy of a candidate transformation for variance stabilization. In this talk, a straightforward measure is introduced by which the variance-stabilizing properties of any two transformations can be compared.

(12)Asymptotic properties of non-linear and long memory process

Junichi Hirukawa (Niigata University)

ABSTRACT

Evaluation of the Japanese pension investments is based on five essential benchmarks of market which exhibit nonlinear and long memory time dependence. The structure of long memory process is located between those of nonstationary process and regular stationary (short memory) process. Therefore, the asymptotic property of the long memory process is supposed to be complex because of its non regularity. In this talk we clarify the unusual feature of asymptotic property of non-linear and long memory process.

(13)Robust estimation in time series models based on minimum density power divergence.

Lee, S. (Seoul National Univ.)

ABSTRACT

We consider the minimum density power divergence estimator as a robust estimator for time series models. It can include the estimator for GARCH paramters and dispersion paramters in diffusion processes. In this talk, special attention will be paid on the estimation of the autocovariance matrix of stainary time series. We demsonstarte that the MDPDE outperforms existing estimators.

(14)An integrated approach for causal association among gene expression, genotype variation and chronic fatigue

H. Solvang Kato (Inst. For Cancer Research, Oslo, Norway)

ABSTRACT

Abstract: Fatigue is known as the most common side effect of cancer therapy. The majority of patients and as much as 30% of cancer survivors experience fatigue and as a consequence have a reduced quality of life. The etiology of fatigue is still unclear. To elucidate the mechanisms behind fatigue, we analyze the association between large-scale data, such as cancer-related information and fatigue questionnaires, whole-genome SNP and mRNA expression analyses in breast cancer survivors. Since incorporating information of genotype, expression and disease may construct regulatory networks and improve understanding of disease etiologies, we focus on developing an integrated approach. The method of choice is model-based statistical tests [Lee et al. Genomics, 94, 2009] to identify causality among specific genotype variation, mRNA expression levels and longitudinal clinical.

(15)A measure of stationarity in locally stationary processes
with applications to testing

Holger Dette (Ruhr-Universit at Bochum)
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ABSTRACT
In this paper we investigate the problem of measuring deviations from
stationarity in locally stationary time series. Our approach is based on a
direct estimate of the L2-distance between the spectral density of the locally
stationary process and its best approximation by a spectral density of a
stationary process. An explicit expression of the minimal distance is derived,
which depends only on integrals of the spectral density of thelocally
stationary process and its square. These integrals can be es-
timated directly without estimating the spectral density, and as a
consequence, the estimation of the measure of stationarity does not require
the speci_cation of smoothing parameters. We show weak convergence of an
appropriately standardized version of the statistic to a standard normal
distribution. The results are used to construct confidence intervals for the
measure of stationarity and to develop a new test for the
hypothesis of stationarity which does not require regularization. Finally, we
investigate the finite sample properties of the resulting con_dence intervals
and tests by means of a simulation study and illustrate the methodology in
three data examples.

(16)Linear Regression with Deterministic Regressors and Unit Root in the Variance

Alexandre Petkovic (Waseda University)

ABSTRACT
The first part of this paper derives the asymptotic distribution of the ordinary least squares estimator in a linear regression model with deterministic regressors when the variance of the innovations is a function of an integrated time series. In the second part of this paper we study the impact of heteroscedasticity on the standard t-test for the slope coefficient in a linear trend model.

(17)Skew-symmetric distributions and Fisher information - A tale of two densities

Marc Hallin and Christophe Ley (Universit¥'{e} Libre de Bruxelles)

ABSTRACT

Skew-symmetric densities recently received much attention in the literature, giving rise to increasingly general families of univariate and multivariate skewed densities. Most of those families, however, suffer from the major drawback of a potentially singular Fisher information in the vicinity of symmetry. All existing results indicate that Gaussian densities (possibly after restriction to some linear subspace)   play a very special and somewhat mysterious role in that context. We totally dispel that widespread opinion by providing a full characterization of the information singularity phenomenon, highlighting its relation to a possible link between symmetric kernels and skewing functions---a link that can be interpreted as the mismatch of two densities.