

PROGRAMME AND ABSTRACTS

8th International Conference on
Computational and Financial Econometrics (CFE 2014)

<http://www.cfenetwork.org/CFE2014>

and

7th International Conference of the
ERCIM (European Research Consortium for Informatics and Mathematics) Working Group on
Computational and Methodological Statistics (ERCIM 2014)

<http://www.cmstatistics.org/ERCIM2014>

University of Pisa, Italy

6 – 8 December 2014

ERCIM WG on Computational
and Methodological Statistics

<http://www.CMStatistics.org>



Computational and
Financial Econometrics

<http://www.CFEnetwork.org>



<http://www.qmul.ac.uk>



UNIVERSITÀ DI PISA

<http://www.unipi.it>



<http://www.unisa.it>

Depósito Legal: AS 03859-2014

ISBN: 978-84-937822-4-5

©2014 - CMStatistics and CFEnetwork

Technical Editors: Angela Blanco-Fernandez, Gil Gonzalez-Rodriguez and George Loizou.

All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any other form or by any means without the prior permission from the publisher.

Co-authors: Sotiris Bersimis

Multivariate statistical process control (MSPC) is nowadays used in many non-industrial fields. Data from such processes usually require the development of special monitoring procedures. We propose a technique in order to monitor bivariate random variables defined on contingency tables. Specifically, we propose a technique for monitoring simultaneously the agreement of two raters, measured by Cohen's kappa, and one percentage defined on the same contingency table. The method is based on an appropriate approximation and it is assessed numerically. We also present an application of the method on real data from a retailer company.

ES57 Room H1 RECENT APPLICATIONS OF GRAPHICAL MARKOV MODELS

Chair: Nanny Wermuth

E099: Long term effects of emotional parentification

Presenter: **Jochen Hardt**, University of Mainz, Germany

Parentification means that a child takes care of a parent - instead of vice versa as it should be. We expected that parentified children would develop deficits in the perception of their own needs in order to survive emotionally in the family - i.e. they should be prone to somatization. The present analysis is based on two internet surveys of about 500 subjects each. Via e-mail, respondents were asked to fill out a set of questionnaires. Two indicators of possible somatization were chosen as primary response, vegetative symptoms and pain. A third primary response, depression, served as a control variable. Sequences of regressions were performed to analyse the data. Contrary to our expectations, depressive symptoms were highly associated to maternal and paternal parentification. Pain was associated with maternal parentification, vegetative symptoms only with paternal parentification. The hypothesis of a deficit in self perception had to be rejected. The associations of parentification to depression are equally strong as those to vegetative symptoms and pain.

E306: Discrete graphical models in social mobility research

Presenter: **Renata Nemeth**, Eotvos Lorand University of Budapest, Hungary

Co-authors: Tamas Rudas

Graphical models are well suited to model direct and indirect associations that are of central importance in many problems of sociology. Such relevance is apparent in research on social mobility. Graphical models are discussed in the framework of marginal models, which provides a basis for a unified view. The marginal modeling framework relies on parameters that capture aspects of associations among the variables that are relevant for the graph and, depending on the substantive problem at hand, may lead to a deeper insight than other approaches. A general version of path models for categorical data is also introduced. These models are applied to the social status attainment process in the USA, Hungary and Czechoslovakia at the end of the last century, and shows that policies in the latter socialist countries to prevent status inheritance had little success.

E575: Triangular symmetric elements of the entropy in graphical modelling

Presenter: **Joe Whittaker**, Lancaster University, United Kingdom

A graphical model is defined by its joint distribution. We define the symmetric elements of the entropy for an arbitrary distribution and concentrate on the third order, the triangular elements. These are found to have interesting properties for the interpretation of the graph and lead to modest efficiency gains in graphical model search. Examples are given appropriate to a joint Gaussian distribution.

E739: Identification of principal causal effects using additional outcomes in concentration graphs

Presenter: **Fabrizia Mealli**, University of Florence, Italy

Co-authors: Barbara Pacini, Elena Stanghellini

Unless strong assumptions are made, nonparametric identification of principal causal effects in causal studies can only be partial and bounds (or sets) for the causal effects are established. In the presence of a secondary outcome, recent results exist to sharpen the bounds that exploit conditional independence assumptions. More general results, though not embedded in a causal framework, can be found on concentration graphs with a latent variable. The aim is to establish a link between the two settings and to show that adapting and extending results pertaining to concentration graphs can help achieving identification of principal causal effects in studies when more than one additional outcome is available. Model selection criteria are also suggested. An empirical illustrative example is provided, using data from a real social job training experiment.

ES151 Room N1 DEPENDENCE IN APPLIED STATISTICS AND DATA ANALYSIS

Chair: Concepcion Ausin

E840: Default probability estimation via pair copula constructions

Presenter: **Claudia Tarantola**, University of Pavia, Italy

Co-authors: Luciana Dalla Valle, Maria Elena De Giuli, Claudio Manelli

Following the growing financial uncertainty, there has been intensive research by financial institutions, regulators and academics to develop models for firm evaluation and default probability estimation. The existing methodologies differ on the available information and data used for assessing the firm value. They can be broadly classified in models based on market data and on accounting data. We propose a novel semi-Bayesian approach for probability of default estimation, that combines features of the previous two classes of models. Our approach is based on multivariate contingent claim analysis and pair copula constructions. For each considered firm, balance sheet data are used to assess the asset value, and to compute its default probability. The asset pricing function is expressed via a pair copula construction, and it is approximated via Monte Carlo simulations. We apply our methodology to the analysis of both defaulted and operative firms. We consider four well-known fraudulent bankruptcy cases (Cirio, Enron, Parmalat and Swissair). Furthermore, to test the efficacy of our methodology we examine also a non defaulted firm (Sysco Company), operating in the same period of the defaulted ones.

E1029: Modeling dependencies in clustered binomial data

Presenter: **Andreas Dartsch**, University of Rostock, Germany

Co-authors: Rafael Weissbach

Binary clustered data frequently occur in different fields of research such as financial econometrics, epidemiology or medical statistics. They are often analyzed as cluster count variables following unbalanced extended binomial distributions with intraclass correlation (ICC) being a parameter (Common Correlation Model) or being determined by choosing α and β in a Beta-Binomial Model. The results of studying and estimating ICC are displayed. Interestingly, ICC is identified and therefore, asymptotically, the likelihood function has a unique maximum at the true value of ICC. Nevertheless, for finite samples, the maximum likelihood estimator does not need to exist. Especially, for large clusters the likelihood is easily monotonous even for higher numbers of clusters. This implies that the maximum likelihood estimator will be on the edge of the feasible region. Emerging from this unsatisfying situation many different estimators for ICC were published in the past. The aim is to point out a few of them and compare their performance within two non-nested models by employing these methodologies to epidemiological and financial data as well as simulated data. In particular, a moment based direct estimator for both balanced and unbalanced designs is developed by inverting a generalized chi-squared statistic.

E1175: Copula-based models for the analysis of glacier discharge at King George Island, Antarctica

Presenter: **Concepcion Ausin**, Universidad Carlos III de Madrid, Spain

Co-authors: Mario Gomez, Carmen Dominguez

As consequence of Global Warming, with the gradual increasing of environmental temperature, the ice cap glaciers lose liquid mass by melting at the base. This is known as glacier discharge. We are interested in the construction of adequate models to describe the distribution of the glacier