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Office: 10.0.02
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Universidad Carlos III de Madrid
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Personal Information
Nationality: Vietnam
Date of birth: 29 Jan 1989
Marital Status: Single

Education

PhD. Business and Quantitative method, Universidad Carlos III de Madrid
Thesis title: Bayesian inference for high dimensional factor copulas
Supervisors: **Prof. M. Concepción Ausín** and **Prof. Pedro Galeano** 2015-Now
Visiting PhD student at Ca' Foscari University of Venice,
Invited by **Prof. Roberto Casarin**, 2017/10 - 2017/12.

MSc. Business and Quantitative method, Universidad Carlos III de Madrid
Thesis title: Modelling Stock Dependence using Factor Copulas 2013-2015
Dissertation Advisor: **Prof. M. Concepción Ausín**

BA, National Economics University, Vietnam (NEU).
Degree in Banking and Finance 2007-2011

References

Dr. Pedro Galeano
Associate Professor
Department of Statistics
UC3M, Madrid, Spain
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Dr. M. Concepción Ausín
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Dr. Juan Miguel Marín
Associate Professor
Department of Statistics
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Research field

Bayesian Econometrics,
Financial Econometrics, Risk management

Job market paper

Variational Bayesian inference for high dimensional factor copulas, with M. Concepción Ausín and Pedro Galeano (2018), (Paper - Code - Appendix - Slides - Poster)

Factor copula models have been recently proposed for describing the joint distribution of a large number of variables in terms of a few common latent factors. In this paper, we employ a Bayesian procedure to make fast inferences for multi-factor and structured factor copulas. To deal with the high dimensional structure, we apply a variational inference (VI) algorithm to estimate different specifications of factor copula models.

Compared to the Markov chain Monte Carlo (MCMC) approach, the variational approximation is much faster and could handle a sizeable problem in a few seconds. Another issue of factor copula models is that the bivariate copula functions connecting the variables are unknown in high dimensions. We derive an automatic procedure to recover the hidden dependence structure. By taking advantage of the posterior modes of the latent variables, we select the bivariate copula functions based on minimizing the Bayesian information criterion (BIC). The simulation studies in different contexts show that the procedure of bivariate copula selection could be very accurate in comparison to the true generated copula model. We illustrate our proposed procedure with two high dimensional real data sets.

Publications

Parallel Bayesian inference for high dimensional dynamic factor copulas, with M. Concepción Ausín and Pedro Galeano (2018) - Journal of Financial Econometrics (forthcoming), (Paper - Code - Appendix - Slides - Poster)

To account for asymmetric dependence in extreme events, we propose a dynamic generalized hyperbolic skew Student-t factor copula where the factor loadings follow Generalized Autoregressive Score (GAS) processes. Conditioning on the latent factor, the components of the return series become independent, which allows us to run Bayesian estimation in a parallel setting. Hence, Bayesian inference on different specifications of dynamic one factor copula models can be done in a few minutes. Finally, we illustrate the performance of our proposed models on the returns of 140 companies listed in the S&P500 index. We compare the prediction power of different competing models using Value-at-Risk (VaR), and Conditional Value-at-risk (CVaR), and show how to obtain optimal portfolios in high dimensions based on minimum CVaR.

Working paper

What are drivers of Swedish sustainable development path? New evidence from Bayesian Dynamic Linear Models, Proceedings XX Applied Economic Meeting, with Jesper Stage, Magnus Lindmark, Huong Nguyen (2017) - Paper

According to my knowledge, we are the first who aim to find out the dynamic relationship between genuine savings (GS) and long-term well-being represented by future consumptions (PVC). By extending the measure of GS to account for a wider range of impacts on natural resource, human capital, and technological progress, we apply the Bayesian approach to estimate Dynamic Linear Models (DLMs). We discover that there are increasing dependent trends with all explanatory GS variables and provide a new empirical evidence on the technological progress that underpins Swedish sustainable development. The dynamic model also provides a trivial framework for testing the hypothesis that their relationship approach to one as the net investment term includes more types of capital.

Work in progress

Leverage stochastic volatility using copulas with Roberto Casarin, M. Concepción Ausín and Pedro Galeano (2018).
Variational inference for Markov switch factor copula models.
Variational inference for dynamic GAS factor copula models.

Presenter at Conference & seminar

Parallel Bayesian inference for high dimensional dynamic factor copulas

Presenter, CFE-CMStatistics 2016	Seville 2016
Presenter, Workshop in Bayesian Econometrics, UC3M	Madrid 2016
Poster presenter, International Society for Bayesian Analysis (ISBA)	Cagliari 2016

What are drivers of Swedish sustainable development path?

Presenter, XX Applied Economics Meetings — Valencia 2017

Variational Bayesian inference for high dimensional factor copulas
Presenter, 49th Meeting of the Working Groups "Statistical Computing" and "Biostatistics" — Gunzburg 2017
Presenter, University Ca' Foscari Internal research seminar — Venice 2017
Presenter, Workshop on Financial Econometrics — Örebro 2018
Presenter, CFE-CMStatistics 2018 — Pisa 2018
Poster presenter, International Society for Bayesian Analysis (ISBA) — Edinburgh 2018
Poster presenter, Bayesian Statistics in the Big Data Era — Marseille 2018

Teaching Experience

Teaching Assistant, Statistics Department, UC3M
Course: *Statistics for Business Administration II* - Web content — 2018
Course: *Statistics for Social Sciences I* - Web content — 2017-2018
Course: *Optimization and simulation for business* - Web content — 2018
Course: *Statistics for Social Sciences III* - Web content — 2017
Course: *Statistics for Business Administration I* - Web content — 2016
Course: *Statistics for Telecommunication* - Web content — 2016
Course: *Financial Risk Management* - Web content — 2015

Short courses

Tail Risk, **Prof. David Veredas** (Université libre de Bruxelles) — Madrid 2014
Empirical Distribution, **Prof. Winfried Stute** (U. of Giessen) — Madrid 2014
The power of penalties, **Prof. Paul Eilers** (Erasmus University) — Madrid 2015
Non-Linear Methods for Complex Systems Analysis, **Prof. Reik Donner** & **Marc Wiedermann** (PIK - Potsdam) — Cologne 2015
Bayesian Statistics and Algorithms (CIRM - Thematic month) — Marseille 2016
Data Mining, **Prof. Mykola Pechenizkiy** (TU Eindhoven) — Jyvaskyla 2016
Longitudinal Data Analysis, **Prof. Molenberghs** (KU Leuven) — Jyvaskyla 2016
Le Cam's Asymptotic Theory, **Prof. Marc Hallin** — Madrid 2017
Quasi Monte Carlo, (Summer School) — Graz 2017
Thematic Semester on Statistics for Energy Markets — Paris 2018
Master class in Bayesian statistics — Marseille 2018

Fellowships and Awards

ISBA World meeting travel grant — 2018
UC3M mobility grant — 2017
ALDE travel grant — 2017
ISBA World meeting travel grant — 2016
PhD fellowship at Universidad Carlos III de Madrid — 2015-2019
Full Master Scholarship at Universidad Carlos III de Madrid — 2013-2015
Scholarship for 3-months exchange at Saint Mary's University (Canada) — 2012
Second prize at National Student Olympiad in Programming Contest — 2009

Computer Skills

Languages: R, C++, Python, Matlab
Software: Latex, Open Office.
OS: Linux.

Languages

Vietnamese (Native), English (Advanced); Spanish (Intermediate); German (Beginner);

Miscellaneous

Representative for UC3M in Econometric game 2017 **(Final round 10/30 teams)**;
Coding Club UC3M content manager (Website: https://codingclubuc3m.github.io/);