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ESOBE

16th European Seminar on Bayesian Econometrics

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ESOBE 2026 is the 16th edition of the European Seminar On Bayesian Econometrics. From a scientific perspective, it is closely related to the Economics, Finance, and Business (EFaB) section of the International Society for Bayesian Analysis (ISBA).

The ESOBE meetings are organised annually in different locations in Europe, although recently they have also been hosted in the U.S. (New Orleans, 2018) and Australia (Melbourne, 2025). A distinctive feature of ESOBE meetings is that they typically involve a significant share of PhD students and early-career researchers, offering them an opportunity to interconnect with established senior scholars and professionals within the Bayesian community.
The meetings have no particular theme, and they encourage discussion and promote research in Bayesian methods, computation, and applications primarily (but not only) inspired by the fields of economics and finance.

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16th European Seminar on Bayesian Econometrics

27 August 2026
Luiss Campus at Viale Romania 32, Rome

8:45 Registration

9:05 Opening Remarks

Petros Dellaportas
University College London and Athens University of Economics and Business
Gaussian invariant Markov chain Monte Carlo

10:15 Coffee break

10:50 Contributed Session 1

Martina Zaharieva
CUNEF Universidad
Variable ordering in a Cholesky-MSV model or stock market data

Sofia Velasco
Banco de España
A dynamic factor model for level and volatility

Daniele Bianchi
Queen Mary University of London
Machine learning portfolio choice under parameter uncertainty

Sylvia Kaufmann
Study Center Gerzensee
A geometric approach to factor model identification

12:35 Lunch

12:35 Poster Session

Radu Craiu
University of Toronto
Inferring model structure from data: MCMC for DAGs

15:10 Young Researcher Session

Lina Arustamyan
Vienna Graduate School of Finance and Vienna University of Economics and Business
Sequential Bayesian persuasion: Algorithmic optimization of entrepreneurial decision making in the context of uncertainty

Igor F.B. Martin
Örebro University
Volume-driven time-of-day effects in intraday volatility models

Rafael Alcantara
University of Texas at Austin

Searching for parallel trends: Discovering diff-in-diff estimators

Luca Gherardini
University of Klagenfurt

Sparse Markov switching models via cumulative shrinkage

Tobias Scheckel
Austrian Institute of Economic Research (WIFO)

Robust Bayesian VARs through power posteriors

16:15 Coffee break

16:50 Contributed Session 2
Session in Memory of George Tiao

Mike West
Duke University

Simultaneous graphical dynamic modeling

Maria Kalli
King's College London

Network modeling of asynchronous change-points in multivariate time series

Jim Griffin
University College London

Time-varying factor augmented vector autoregression with grouped sparse autoencoder

Stefano Peluso
Università Cattolica del Sacro

Cuore and Università della Svizzera italiana Bayesian change point detection in VAR processes

20:15 Conference Dinner

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16th European Seminar on Bayesian Econometrics

28 August 2026
Luiss Campus at Viale Romania 32, Rome

8:45 Opening

Conception Ausín
Universidad Carlos III de Madrid
Multivariate extreme joint dependencies using nonparametric copulas

9:45 Coffee break

10:20 Contributed Session 3

Cem Cakmakli
Durham University
Every forecaster matters: Efficient modeling of the survey of professional forecasters for density nowcasting

Lukas Berend
FernUniversität in Hagen
Sharpening identification in large structural VARs using narrative restrictions

James Mitchell
Federal Reserve Bank of Cleveland
Probabilistic anchoring of inflation expectations

Maximilian Schröder
European Central Bank
Multivariate uncertainty and distributional transmission

Stefano Grassi
University of Rome "Tor Vergata"
Cutting the chain: Adaptive mixtures for heterogeneous DSGE estimation

12:30 Lunch

12:30 Poster session

14:00 Young Researcher Session

Luis Gruber
University of Klagenfurt
Uncertainty everywhere: Integrating conceptual uncertainty in the stochastic discount factor

Patrick Woitschig
Duke University
Bayesian dynamic modeling of realized volatility in financial asset price forecasting

Dongu Han
Meiji University

Log-regularly varying scale mixture of asymmetric Laplaces for robust Bayesian quantile regression

Hyun J.S. Chu
University of Notre Dame and Korea University

Time-varying variable selection for macroeconomic forecasting: A Bayesian regression tree approach

Callum Wu
University College London

Time-varying recalibration of predictive distributions via Beta and neural spline flow transformations

Antonio Peruzzi
Ca' Foscari University of Venice

A Bayesian dynamic latent space model for weighted networks

15:05 Contributed Session 4

Ivan Jeliazkov
University of California, Irvine

The impact of heteroskedasticity in observational studies of causal effects

Andriy Norets
Brown University

Relaxing the Fréchet assumption in spatial economics: A finite mixture approach

Roberto Casarin
Ca' Foscari University of Venice

Compressed Bayesian tensor regression

16:20 Coffee break

16:55 Contributed Session 5

Annika Camehl
Erasmus University Rotterdam

A conformal level set method for multiple-output panel quantiles

Genya Kobayashi
Meiji University

Dynamic Bayesian regression quantile synthesis for forecasting outlook-at-risk

Jan Martin Carl Wenkel
Karlsruhe Institute of Technology

Bayesian additive regression tree copula processes for scalable distributional prediction

18:15 Concluding Remarks

Thursday 27th

Gaussian invariant Markov chain Monte Carlo

KL

M.K. Titsias[1], A. Alexopoulos[2], S. Liu[3], P. Dellaportas[2,3]

[1]Google DeepMind, United Kingdom
[2]Athens University of Economics and Business, Greece
[3]University College London, United Kingdom

We develop sampling methods, which consist of Gaussian invariant versions of random walk Metropolis (RWM), Metropolis adjusted Langevin algorithm (MALA) and second-order Hessian or Manifold MALA. Unlike standard RWM and MALA we show that Gaussian invariant sampling can lead to ergodic estimators with significantly improved statistical efficiency. This is due to a remarkable property of Gaussian invariance that allows us to obtain exact analytical solutions to the Poisson equation for Gaussian targets. These solutions can be used to construct efficient and easy-to-use control variates for variance reduction of estimators under any intractable target. We demonstrate the new samplers and estimators in several examples, including high-dimensional targets in latent Gaussian models, where we compare against several advanced methods and obtain state-of-the-art results. We also provide theoretical results regarding geometric ergodicity and an optimal scaling analysis that shows the dependence of the optimal acceptance rate on the Gaussianity of the target.

Variable ordering in a Cholesky-MSV model for stock market data

CT

P. Wu[1], M.D. Zaharieva[2]

[1]University of Strathclyde, United Kingdom
[2]CUNEF Universidad, Spain

Modeling the time-varying structure of the covariance matrix of financial time-series has been widely studied both theoretically and empirically in the finance literature. Recently, the Cholesky-decomposition-based approach to multivariate stochastic volatility has been established as a flexible and interpretable alternative. Despite that, the issue of the order dependence in this type of models has not been the primary focus. In this paper, we propose a prior for variable ordering in a Cholesky-type multivariate stochastic volatility model, where a natural ordering of the time series is not available. We apply the approach to forecasting a cross-section of stock returns.

A dynamic factor model for level and volatility

CT

H. Mumtaz[1], S. Velasco[2]

[1]Queen Mary University of London, United Kingdom
[2]Banco de Espana, Spain

This paper develops a dynamic factor model in which common level and volatility factors evolve jointly, allowing conditional means and variances to interact endogenously within a large-information setting. The joint evolution of these factors provides a tractable framework for modeling risk, as fluctuations in volatility affect both the dispersion and the location of outcomes, generating state-dependent and asymmetric tail risks in predictive distributions. Volatility is captured by latent common factors that drive co-movement in second moments across a large panel, while heavy-tailed idiosyncratic shocks absorb transitory outliers and

isolate persistent uncertainty dynamics. The framework embeds these interactions directly within a factor structure, allowing risk to arise endogenously from the joint dynamics of the system rather than being imposed through reduced-form approaches. Empirically, the model delivers systematic improvements in density forecast accuracy, particularly in the tails of the predictive distribution and at medium horizons. An applica-tion to international inflation highlights a dominant global level component in advanced economies and stronger regional and volatility contributions in emerging and developing economies, pointing to substantial heterogeneity in the role of uncertainty across countries.

Machine learning portfolio choice under parameter uncertainty

CT

D. Bianchi[1], X. Zheng[1]

[1]Queen Mary University of London, United Kingdom

We develop a Bayesian neural network framework for parametric portfolio choice that maps characteristics directly to portfolio weights under a generalized posterior. The posterior over network parameters induces credible intervals around each weight, disciplining which positions to trade, how aggressively, and whether active management creates value. The resulting trading rules substantially reduce turnover while preserving risk-adjusted returns. How much they save depends on the prior, which shapes the geometry of posterior uncertainty: sparsity-inducing priors produce robust cost reductions, tight uniform-shrinkage priors do not. Because the prior operates on the characteristic-to-weight mapping, the economic mechanism is parameter uncertainty rather than forecast confidence.

A Geometric Approach to Factor Model Identification

CT

S. Kaufmann[1], M. Pape[2]

[1]Study Center Gerzensee, Switzerland
[2]Ruhr-University Bochum, Germany

We use the geometric representation of factor models to represent the factor loading structure by sets corresponding to unit-specific non-zero loadings. We formulate global and local, rotational identification conditions based on set conditions. We propose an algorithm to evaluate efficiently Sato (1992)'s counting rule. We demonstrate the efficiency and the performance of the algorithms by a simulation study.

Inferring model structure from data: MCMC for DAGs

KL

R. Craiu[1], M. Greenberg[1], K.R. Campbell[1]

[1]University of Toronto, Canada

Inferring a directed acyclic graph (DAG) given data is computationally challenging. Current state-of-the-art MCMC methods for graph inference efficiently scan the space by first considering a restricted search space and iteratively expand the space until a stopping criterion is met. We estimate the error introduced from current methods that use restricted spaces compared to the full space and develop a novel MCMC method that reduces this error. The new adaptive algorithm allows for either expansion or contraction of the search space at any iteration. Extensive numerical experiments demonstrate the efficiency of the new algorithm and compare its performance with existing methods.

Sequential Bayesian persuasion: Algorithmic optimization of entrepreneurial decision making in the context of uncertainty

YR

L. Arustamyan[1,2]

[1]Vienna Graduate School of Finance, Austria
[2]Vienna University of Economics and Business, Austria

At the core of entrepreneurial finance lies a fundamental persuasion problem: no matter how convinced entrepreneurs are of their startup's potential, they must persuade external investors to commit capital under uncertainty and incomplete information. This paper develops a dynamic model of strategic information disclosure using the Bayesian persuasion framework, where a startup gradually learns which aspects of its project most effectively influence investors' beliefs. Using Q-learning, the process is modeled as a Markov Decision Process, which helps the entrepreneur slowly improve their way of communicating based on how investors react. Investors are assumed to change their beliefs on their own via Bayesian updating and also through a DeGroot social learning process, which is similar to how groups of investors, like a group raising money together, share and shape ideas. Targeted, strategic signaling policy, according to our findings, performs better than complete transparency, resulting in quicker financing and improved belief alignment. Robustness tests provide valuable information for optimizing pitch strategy in the face of uncertainty by demonstrating the effects of learning parameters, belief structures, and investor network design on model performance.

Volume-driven time-of-day effects in intraday volatility models

YR

I.F.B. Martins[1], A. Virbickaite[* 2], H. Nguyen[3], H.F. Lopes[1]

[1]Örebro University, Sweden
[2]CUNEF Universidad, Spain
[3]Linköping University, Sweden
[4]Insper Institute of Education and Research, Brazil

We propose a high-frequency stochastic volatility model that integrates persistent component, intraday periodicity, and volume-driven time-of-day effects. By allowing intraday volatility patterns to respond to lagged trading activity, the model captures economically and statistically relevant departures from traditional intraday seasonality effects. We find that the volume-driven compo-nent accounts for a substantial share of intraday volatility for futures data across equity indexes, currencies, and commodities. Out-of-sample, our forecasts achieve near-zero intercepts, unit slopes, and the highest R2 values in Mincer-Zarnowitz regressions, while horse-race regressions indicate that competing forecasts add little information once our predictions are included. These statistical improvements translate into economically meaningful gains, as volatility-managed port-folio strategies based on our model consistently improve Sharpe ratios. Our results highlight the value of incorporating lagged trading activity into high-frequency volatility models.

Searching for Parallel Trends: Discovering Diff-in-Diff Estimators

YR

R. Alcantara[1], A. Herren[1], P. Jain[1], P.R. Hahn[2], J. Murray[1]

[1]University of Texas at Austin, United States
[2]Arizona State University, United States

This paper proposes a novel data-dependent strategy for developing Bayesian difference-in-difference estimators of conditional average treatment effects. To this end, we make use of pre-trend data to search for regions of a time-invariant feature space where there is evidence of parallel trends. More specifically, we provide an algorithm to search for zero-bias regions, which we apply to posterior draws of the pointwise pre-trend bias. Then, we construct a modified posterior in which we draw the CATT estimates from a prior for points which fall in regions with estimated bias above some threshold, propagating the uncertainty in the PTA search process into our CATT estimates. By contrast, previous work assesses the validity of conditional PTA by performing ad hoc statistical tests on pre-specified strata, with no clear way of propagating that uncertainty into the CATT results. The feasibility of the new approach is demonstrated via a carefully designed simulation study.

Sparse Markov switching models via cumulative shrinkage

YR

G. Kastner[1], L. Gherardini[1]

[1]University of Klagenfurt, Austria

Determining the number of latent states is a central problem in hidden Markov and Markov-switching models. Information criteria require fitting many candidate models, while trans-dimensional samplers and overfitted mixtures demand substantial computation and careful tuning. We ex-tend the cumulative shrinkage process (CUSP) of Legramanti et al. (2020), developed for factor models, to Markov-switching processes. A shrinkage prior is placed on the unnormalized gamma propensities underlying the transition matrix, inducing shrinkage on higher-indexed regimes. This penalizes transitions into redundant states, induces column-wise sparsity in the normalized matrix, and automatically learns the effective number of regimes. Because the prior acts only on the latent state process, it can be layered onto a broad class of Markov-switching models without affecting state-specific inference. We establish theoretical properties of the prior and develop a partially marginalized Gibbs sampler with data augmentation, and an adaptive variant that truncates spuri-ous regimes. Simulation studies show that the method accurately recovers the true number of regimes across diverse designs, while an illustration on a classical river flow series yields a sharp, stable posterior, in contrast to the tuning-sensitive Dirichlet prior. The approach thus adapts to the complexity of real-world time series while preserving a parsimonious regime structure.

What can we learn from and about sufficient macro statistics under set-identification?

YR

M. Fankhauser[1]

[1]Bocconi University, Italy

Modern macroeconometric tools often focus on policy-relevant statistics that are nonlinear, non-bijective functions of impulse responses or other structural parameters, such as multipliers, decom-positions, or normalized effects. Standard priors on primitive parameters

therefore induce opaque and often unintended priors on these objects. In set-identified models, however, the conditional posterior of the unidentified structural component coincides with the corresponding conditional prior. We exploit this observation to show that posterior inference on such statistics can be adjusted by simple reweighting of baseline conditional draws. We then develop a framework for specifying economically meaningful classes of priors directly on the statistic of interest. This yields a tractable form of robust Bayesian inference that nests both single-prior Bayes and full ambiguity-robust Bayes as special cases. In applications, we show that these prior classes can substantially sharpen inference and clarify which functional prior restrictions drive substantive macro conclusions.

Robust Bayesian VARs through power posteriors

YR

F. Huber[1], M. Marcellino[2,3], T. Scheckel[4]

[1]University of Salzburg, Austria
[2]Bocconi University, Ital
[3]CEPR, IGIER, BAFFI, BIDSA, Italy
[4]WIFO, Austria

Model misspecification in multivariate econometric models can strongly in- fluence estimates of quantities of interest such as impulse response functions, structural parameters, and forecast distributions, even more so at longer horizons due to parameter convolution. We propose powered Bayesian VARs (pBVARs) to address specification issues. Instead of using the standard posterior, we rely on the power posterior that raises each equation-specific likelihood to a fractional power, thereby protecting posterior inference from the effects of unknown misspecification. Equation-specific learning rates adapt automatically to the degree of misspecification present in each series. In a comprehensive Monte Carlo study covering a large set of misspecified data-generating pro-cesses, pBVARs produce appreciably better calibrated impulse response estimates than standard BVARs. Applied to US data, pBVARs yield economically plausible structural impulse responses to a monetary policy shock that are robust to changes in lag length, a form of dynamic misspecification that can substantially distort inference in standard BVARs.

Simultaneous graphical dynamic modeling

CT

L. Vrotsos[1], M. West[1]

[1]Duke University, United States

We review theory and methodology of the class of simultaneous graphical dynamic linear models (SGDLMs) that provide flexibility, parsimony and scalability of multivariate time series analysis. Discussion includes core theoretical aspects and summaries of existing Bayesian methodology for forward filtering and forecasting with SGDLMs. The review is complemented by new theory linking dynamic graphical and factor models, and extensions of the Bayesian methodology. This addresses graphical structure uncertainty via model marginal likelihood evaluation, and analysis with missing data relevant to counterfactual analysis. The latter advances the ability to scale causal analysis to higher-dimensional time series. Aspects of the theory and methodology are exemplified in a global macroeconomic time series study with time-varying cross-series relationships and primary interests in potential causal effects. The example highlights the utility of SGDLMs with insights generated by the theoretical structure of these models, and benefits of fully Bayesian assessment of post-intervention outcomes in causal time series studies as in prediction more generally.

Network modeling of asynchronous change-points in multivariate time series

CT

C. McKee[1], M. Kalli[1]

[1]King's College London, United Kingdom

This article introduces a novel Bayesian method for asynchronous change-point detection in mul-tivariate time series. This method allows for change-points to occur earlier in some (leading) series followed, after a short delay, by change-points in some other (lagging) series. Such dynamic dependence structure is common in fields such as seismology and neurology where a latent event such as an earthquake or seizure causes certain sensors to register change-points before others. We model these lead-lag dependencies via a latent directed graph and provide a hierarchical prior for learning the graph's structure and parameters. Posterior inference is made tractable by modifying particle MCMC methods designed for univariate change-point problems. We apply our method to both simulated and real datasets from the fields of seismology and neurology. In the simulated data, we find that our method outperforms competing methods in settings where the change-point locations are dependent across series. In the real data applications we show that our model can also uncover interpretable network structure.

Time-varying factor augmented vector autoregression with grouped sparse au-toencoder

CT

Y. Luo[1], B. Paige[1], J. Griffin[1]

[1]University College London, United Kingdom

Recent economic events, including the global financial crisis and COVID-19 pandemic, have exposed limitations in linear Factor Augmented Vector Autoregressive (FAVAR) models for forecasting and structural analysis. Nonlinear dimension techniques, particularly autoencoders, have emerged as promising alternatives in a FAVAR framework, but challenges remain in identifiability, interpretabil-ity, and integration with traditional nonlinear time series methods. We address these challenges through two contributions. First, we introduce a Grouped Sparse autoencoder that employs the Spike-and-Slab Lasso prior, with parameters under this prior being shared across variables of the same economic category, thereby achieving semi-identifiability and enhancing model interpretabil-ity. Second, we incorporate time-varying parameters into the VAR component to better capture evolving economic dynamics. Our empirical application to the US economy demonstrates that the Grouped Sparse autoencoder produces more interpretable factors through its parsimonious structure; and its combination with time-varying parameter VAR shows superior performance in both point and density forecasting. Impulse response analysis reveals that monetary policy shocks during recessions generate more moderate responses with higher uncertainty compared to expansionary periods.

Bayesian change point detection in VAR processes

CT

S. Peluso[1,2], S. Chib[3], A. Mira[2,4]

[1]Università Cattolica del Sacro Cuore, Italy
[2]Università della Svizzera italiana, Switzerland
[3]Washinghton University in St. Louis
[4]Università degli Studi dell'Insubria

We study Bayesian inference for structural breaks in vector autoregressive (VAR) models, where both contemporaneous and dynamic interdependencies complicate regime identification. Within this framework, we extend the asymptotic analysis of Shimizu (2022) to multiple dependent series and establish conditions under which the posterior distribution of the change-point location under conjugate priors asymptotically concentrates on the true break. Consistency is further demonstrated for non-conjugate priors, and the results are extended to multiple change-points under controlled overlaps between estimated and true regimes. Simulation studies confirm the accurate recovery of structural breaks, and empirical applications to U.S. macroeconomics data illustrate the method's advantages over existing approaches.

Friday 28th

Multivariate extreme joint dependencies using nonparametric copulas

KL

C. Ausín[1], M. Kalli[2]

[1] Universidad Carlos III de Madrid, Spain
[2] King's College London, United Kingdom

We propose a novel multivariate copula model capable of capturing both central and tail depen-dence in joint probability distributions. Accurately modeling dependence structures, particularly in the joint tails, is crucial for applications in risk management, such as macroeconomics and finance. Our approach adopts a Bayesian nonparametric framework to construct a random copula model based on infinite partitions of unity. Specifically, we define a hierarchical prior over an infinite partition of the unit hypercube, which admits a stick-breaking representation and yields an infinite mixture of products of independent beta densities. Leveraging this stick-breaking formulation, we develop a Gibbs sampling algorithm for posterior inference. In our empirical analysis, we evaluate the proposed model using both simulated data and real datasets involving insurance claims and portfolio returns. We compare its ability to capture central and tail dependence against several parametric and nonparametric benchmark copula models. The results demonstrate that our model consistently outperforms competing approaches in both simulated and real-world scenarios.

Every forecaster matters: Efficient modeling of the survey of professional fore-casters for density nowcasting

CT

Cem Çakmaklı[1,2], N. Taspınar[2]

[1]Durham University, United Kingdom
[2]Koç University, Turkey

This paper develops a flexible parametric framework for modeling Survey of Professional Forecasters data at the level of individual participants. Using an unbalanced panel of U.S. GDP growth nowcasts and short-horizon forecasts, we specify a state-space model that captures time variation in the full cross-sectional forecast distribution. The mean forecast follows a stochastic process with its own volatility component, while a common stochastic volatility in the observation equation captures time-varying disagreement among forecasters. To model non-Gaussian features of the cross section, forecast errors follow an asymmetric Student-t distribution with time-varying skewness, allowing the model to track changes in the first four moments of the survey distribution. The framework naturally accommodates forecaster entry, exit, and intermittent missing observations. In sample, it provides distinct measures of uncertainty and disagreement, highlighting that uncertainty in the mean process is especially pronounced around business-cycle turning points, whereas disagreement may also arise during political or geopolitical episodes. Out of sample, we combine the survey-based distribution with a dynamic factor nowcasting model by aligning predictive moments. The results show that individual-level survey information improves density nowcasts of U.S. GDP growth and yields tractable measures of Growth-at-Risk.

Sharpening identification in large structural VARs using narrative restrictions

CT

L. Berend[1], J. Prüser[1]

[1]Universität in Hagen
[2]TU Dortmund, Germany

We propose a high-dimensional structural vector autoregression framework with a factor structure in the error terms that accommodates a large number of linear inequality restrictions on both impact impulse responses and structural shocks. Our framework extends recent advances in large sign-restricted VARs by allowing narrative restrictions to be imposed directly through constraints on structural shocks via prior distributions, thereby sharpening identification and enhancing the economic interpretability of the structural shocks. To estimate the model, we develop a com-putationally efficient sampling algorithm that scales well with both model dimension and the number of imposed restrictions, while avoiding the low acceptance-rate problems associated with existing rejection-based approaches. We apply our methodology to a large-scale structural VAR for the U.S. economy, identifying ten structural shocks and tracing their dynamic effects across thirty-nine macroeconomic and financial variables. The empirical application demonstrates that the incorporation of narrative restrictions improves structural identification in high-dimensional settings by reducing the uncertainty surrounding impulse response functions and facilitating a clearer economic interpretation of the identified structural shocks.

Probabilistic Anchoring of Inflation Expectations

CT

N. Fritsch[1], J. Mitchell[1]

[1]Federal Reserve Bank of Cleveland

We develop a probabilistic measure of inflation expectations anchoring that extends traditional point-based metrics to assess whether the entire distribution aligns with policymakers' target. Using Bayesian function-on-scalar regression in Bayes space with centered log-ratio transforma-tions, we test whether risk-neutral densities from inflation options are consistent with a target density and orthogonal to macroeconomic surprises across the full support. Functional principal components estimation yields interpretable coefficients revealing where macro news affects ex-pectations—center versus tails. Traditional tests ask if mean expectations equal the target; we test if the entire distribution matches the policymaker's tolerance via hypothesis tests and R2 decompositions. Analyzing weekly 5-year-ahead densities from 2012-2025, we find time-varying anchoring. Expectations tightened during 2016-2020, concentrating near 2%. Since 2021, mass shifted persistently toward the upper tail: probability of inflation exceeding 4% rose from 5% to 12%, even as mean expectations stayed near 2%. This uppertail unanchoring–invisible to traditional metrics–responds primarily to labor market surprises.

Multivariate uncertainty and distributional transmission

CT

M. Schröder[1]

[1]European Central Bank, Germany

Macroeconomic policy increasingly requires assessments of risk rather than point forecasts alone. This paper develops a structural framework to compute impulse responses for

scenario probabili-ties and the full predictive distribution of macroeconomic outcomes. The approach combines a regime-dependent mixture VAR with endogenous state probabilities and heteroskedastic shock identification, complemented by sparse sign and narrative restrictions. Applied to U.S. data from 1976-2024, the model is used to study credit, geopolitical risk, and energy price shocks. Results show that shocks differ not only in mean effects, but also in how they reshape stagflation risk and transition probabilities into high-volatility states.

Cutting the chain: Adaptive mixtures for heterogeneous DSGE estimation

YR

M. Alfero[1], S. Grassi[1], M. Lorusso[2], F. Ravazzolo[3,4,5]

[1]"Tor Vergata" University of Rome, Italy
[2]Newcastle University Business School
[3]BI Norwegian Business School
[4]Free University of Bozen-Bolzano
[5]RCEA

This paper proposes a robust adaptive importance sampling method for the Bayesian estimation of heterogeneous-agent New Keynesian models. The procedure is based on a mixture of Student-t distributions estimated by an importance-sampling-weighted expectation-maximization algorithm and introduces a modification to mitigate weight degeneracy. The method targets settings where likelihood evaluation is computationally costly, and the posterior distribution may be skewed, heavy-tailed, or multimodal. We assess its finite-sample performance via Monte Carlo experiments on two benchmark heterogeneous-agent models of increasing complexity, a one-asset and a two-asset New Keynesian model. We compare it with Random-Walk Metropolis-Hastings and Sequential Monte Carlo. Across designs, the proposed method delivers posterior moments with comparable accuracy while requiring less computational time. These results suggest that the method provides a practical, computationally efficient tool for Bayesian estimation of heterogeneous-agent models.

Uncertainty everywhere: Integrating conceptual uncertainty in the stochastic discount factor

YR

L. Gruber[1], G. Kastner[1], S. Voigt[2,3], P. Weiss[4]

[1]University of Klagenfurt, Austria
[2]University of Copenhagen, Denmark
[3]Danish Finance Institute, Denmark
[4]Reykjavik University, Iceland

Model and parameter uncertainty are well-established concerns in estimating the stochastic dis-count factor. We show that conceptual uncertainty, stemming from defensible yet arbitrary choices in factor construction, like portfolio breakpoints or weighting schemes, is equally consequential. We develop a path-augmented Bayesian model averaging framework that systematically integrates trillions of plausible risk factor permutations into the stochastic discount factor. Accounting for conceptual uncertainty reduces pricing errors and yields 50% higher out-of-sample Sharpe ratios relative to established benchmark models. Our findings underscore the critical role of data prepro-cessing in asset pricing and demonstrate that explicitly modeling such choices enhances empirical inference.

Bayesian dynamic modeling of realized volatility in financial asset price forecast-ing

YR

P. Woitschig[1], M. West[1]

[1]Duke University, United States

We present a new class of Bayesian dynamic models for bivariate price-realized volatility time series in financial forecasting. This introduces novel dynamic models for positive, real-valued time series developed to represent realized volatility, and integrates them with traditional Bayesian dynamic linear models (DLMs) for asset price series. The new class of models resulting represents volatility feedback and leverage effects through use of realized volatility proxies in conditional DLMs for prices or returns, coupled with the synthesis of higher-frequency data to track and anticipate volatility fluctuations. Importantly, the new theoretical framework is computationally trivial, extending conjugate-form Bayesian analyses for sequential filtering and model monitoring, and with simple and direct simulation for forecasting. A main applied setting is equity return forecasting with both daily prices and realized volatility from high-frequency, intraday data. Detailed empirical studies of multiple S&P sector ETFs highlight the improvements achievable in asset price forecasting relative to standard models, as well as contextual insights generated on the nature and practical relevance of volatility leverage and feedback effects. The analytic structure and negligible extra computational cost will enable scaling to higher-dimensions for multivariate price series forecasting for decouple/recouple portfolio construction and risk management applications.

Log-regularly varying scale mixture of asymmetric Laplaces for robust Bayesian quantile regression

YR

D. Han[1], G. Kobayashi[1], S. Sugasawa[2]

[1]Meiji University, Japan
[2]Keio University, Japan

Bayesian quantile regression models based on the asymmetric Laplace distribution often yield unreliable posterior inference in the presence of outliers or model misspecification. To address this issue, we propose a flexible error specification using a finite mixture of two components that capture both light- and heavy-tailed behaviors. To the best of our knowledge, this is the first approach of its kind in the context of robust Bayesian quantile regression. For the heavy-tailed component, we introduce a novel class of distributions with log-regularly varying densities, allowing for tail behavior heavier than the Cauchy distribution while still admitting a scale mixture of normals representation for efficient computation. We develop both a Gibbs sampling algorithm and a variational Bayes approach to enable scalable posterior inference. The proposed model is shown to possess strong robustness properties, effectively downweighting extreme observations under mild conditions, and providing theoretical support for the use of global-local shrinkage priors in quantile regression. Simulation studies and an empirical application to Boston Housing and carbon dioxide data demonstrate that the proposed model consistently achieves the lowest out-of-sample check loss and Huberised loss among all competing methods, as well as improved point and interval estimation in the presence of outliers.

Time-varying variable selection for macroeconomic forecasting: A Bayesian re-gression tree approach

YR

H.J.S. Chu[1,2], J. Kim[3], K.H. Kang[2]

[1]University of Notre Dame, United States
[2]Korea University, Korea
[3]Sogang University, Seoul, Korea

The growing availability of large datasets in macroeconomic forecasting has renewed interest in variable selection methods. However, most existing approaches assume stable relationships among variables, failing to account for the time-varying relevance of predictors due to nonlinear dynamics and structural changes in the economy. To address this issue, we propose a Bayesian Dirac Classifica-tion and Regression Tree (B-DART) model that jointly captures time-varying predictor relevance and performs regime-specific stochastic variable selection within a nonlinear tree-based framework. Empirical results show that the proposed B-DART model delivers superior forecast accuracy relative to Bayesian CART and conventional stochastic variable selection models. These gains are especially pronounced during the post-COVID-19 period, which is characterized by heightened volatility and structural instability.

Time-varying recalibration of predictive distributions via Beta and neural spline flow transformations

YR

C. Wu[1], J. Griffin[1]

[1]University College London, United Kingdom

Forecast combinations methods such as Bayesian Model Averaging and its extensions such as Dynamic Model Averaging are widely employed for their empirical gains. However, they suffer from a fundamental theoretical caveat: any nontrivial weighted average of calibrated predictive distributions is inherently miscalibrated. This motivates recalibration: a post-hoc transformation of the combined forecast designed to restore calibration without altering the underlying combination scheme. This miscalibration may evolve over time, reflecting underlying regime shifts that static recalibration maps cannot capture. We propose a framework for recalibrating combined predictive distributions through a time-varying transformation applied to the Probability Integral Transform (PIT) values of the combined forecast. We apply this framework to predictive distributions generated by the Loss Discounting Framework (LDF), evaluate its efficacy through simulation studies and two empirical applications – GBP/USD exchange rate returns and US quarterly inflation. Performance is assessed using uniformity diagnostics, alongside strictly proper scoring rules, which jointly evaluate calibration and sharpness. Our results show that the adaptively recalibrated combination outperforms both the raw ensemble and the underlying individual forecasts, providing a robust solution to the dynamic miscalibration problem.

A Bayesian dynamic latent space model for weighted networks

YR

R. Casarin[1], M. Iacopini[2], A. Peruzzi[1]

[1]Ca' Foscari University of Venice, Italy
[2]Luiss University of Rome

A new dynamic latent space eigenmodel (LSM) is proposed for weighted temporal networks. It accommodates integer-valued weights, time-varying sparsity and time-varying node

latent fea-tures. Lagged and contemporaneous dependence across nodes and features are introduced, a characteristic neglected in the LSM literature. A Bayesian approach is used to address two infer-ence challenges: latent feature estimation and choice of latent space dimension. We provide a point-process representation of the network weights, derive the joint posterior distribution of the features, and propose a new efficient sampler for posterior approximation in high dimensional networks. A Laplace approximation of the partial marginal likelihood is used to sample the latent dimension. Two illustrations, that are relevant in international economics and neuroeconomics, show the ability of the proposed framework to uncover dynamic latent structures in trade and neural connectivity. Overall, our procedure is general, as it can be easily adapted to static and dynamic settings, as well as to other discrete or continuous weight distributions.

The impact of heteroskedasticity in observational studies of causal effects

CT

J. Gao[1], I. Jeliazkov[2]

[1]Pinterest Inc., United States
[2]University of California, Irvine, United States

There is an extensive causal literature, yet little is known about the impact of heteroskedasticity in popular observational settings. While heteroskedasticity in treatment assignment or response generation can be of intrinsic interest in many contexts, its interaction with nonlinearities in treat-ment models can bias estimators in ways that standard error adjustments alone cannot correct. To address these challenges, we extend current methodology in regression discontinuity designs, potential outcome regressions, propensity score matching, and inverse probability weighting using a Bayesian framework. This approach incorporates flexible modeling and customized parameter estimation and model comparison algorithms to account for model uncertainty and improve es-timation efficiency. Simulation studies assess the consequences of omitted heteroskedasticity and gauge the performance of the proposed modeling and estimation methods, while real-world applications demonstrate their practical implications. Specifically, we examine the effect of aca-demic probation on subsequent academic performance, the influence of Medigap on healthcare expenditures, and the impact of COVID-19 vaccination on mental well-being in the UK. The results provide compelling evidence that the risks of ignored heteroskedasticity in causal analyses should not be overlooked.

Relaxing the Fréchet assumption in spatial economics: A finite mixture ap-proach

CT

A. Norets[1], K. Shimizu[1], M. Turner[1]

[1]Brown University, United States
[2]University of Alberta, Canada

Spatial and migration discrete choice models are foundational in spatial economics for studying labor mobility, location, and productivity. These models universally assume Fréchet preference or skill shocks, equivalently a Gumbel distribution for their logarithms, because this yields tractable closed-form choice probabilities, essential given many alternatives. Yet the assumption is restrictive and can misspecify population heterogeneity. We relax it using finite location-scale mixtures of Fréchet distributions. Because these mixtures approximate nonparametric classes as the scale shrinks and components multiply, the

method is semiparametric, yet both choice probabilities and expected wages conditional on the optimal location choice remain closed-form. We apply it to the 2019 framework of Bryan and Morten, which combines region-level log-normal wage shocks with Fréchet skill shocks and is estimated by instrumental variables on migration shares and two wage moments. We instead develop likelihood-based estimation. The mapping from unobserved normal shocks to observed data is one-to-one, a contraction mapping composed with a linear map, so we define the likelihood by change of variables. Because its Jacobian is prohibitive, we evaluate it via the matrix determinant lemma. We estimate the model in a Bayesian framework using Stan and use it to quantify the productivity gains from removing mobility constraints.

Compressed Bayesian tensor regression

CT

R. Casarin[1], R. Craiu[2], Q. Wang[1]

[1]Ca' Foscari University of Venice, Italy
[2]University of Toronto, Canada

To address the common problem of high dimensionality in tensor regressions, we introduce a generalized tensor random projection method that embeds high-dimensional tensor-valued co-variates into low-dimensional subspaces with minimal loss of information about the responses. The method is flexible, allowing for tensor-wise, mode-wise, or combined random projections as special cases. A Bayesian inference framework is provided featuring the use of a hierarchical prior distribution and a low-rank representation of the parameter. Strong theoretical support is provided for the concentration properties of the random projection and posterior consistency of the Bayesian inference. An efficient Gibbs sampler is developed to perform inference on the compressed data. To mitigate the sensitivity introduced by random projections, Bayesian model averaging is employed, with normalising constants estimated using reverse logistic regression. An extensive simulation study is conducted to examine the effects of different tuning parameters. Simulations indicate, and the real data application confirms, that compressed Bayesian tensor regression can achieve better out-of-sample prediction while significantly reducing computational cost compared to standard Bayesian tensor regression.

A conformal level set method for multiple-output panel quantiles

CT

A. Camehl[1], K. Gruber[1]

[1]Erasmus University Rotterdam, The Netherlands

The probability-indexed, conditional superlevel set provides a natural quantile analogue in the multivariate setting that leads to logically consistent estimates of the regression quantiles with nominal coverage guarantees. We define the conditional probability of an observation falling within a learned superlevel set as a probabilistic conformity score. This allows us to construct valid and adaptive multivariate prediction regions that closely align with the high-density areas of any well-calibrated conditional density estimator. To that end, we approximate the time-indexed multivariate conditional density of a (possibly high-dimensional) output vector with a variational, equation-by-equation Gaussian mixture model. Our framework (i) enables to construct coherent, geometrically meaningful multivariate prediction regions with valid coverage probability that reflect the structure of the estimated conditional density, (ii) allows to exploit outcome dependencies and nonlinearities in multiple-output panel quantile regression, and (iii) easily scales to high-dimensional and structurally complex settings.

Dynamic Bayesian regression quantile synthesis for forecasting outlook-at-risk

CT

G. Kobayashi[1], S. Sugasawa[2], Y. Yamauchi[3], D.Han[1]

[1]Meiji University, Japan
[2]Keio University, Japan
[3]Nagoya University, Japan

This paper proposes dynamic Bayesian regression quantile synthesis (DRQS), a novel method for quantile forecasting within the Bayesian predictive synthesis (BPS) framework designed to combine quantile-specific information from multiple agent models. While existing BPS approaches primarily focus on mean forecasting, our method directly targets the conditional quantiles of the response variable by utilizing the asymmetric Laplace distribution for the synthesis function. The resulting framework can be interpreted as a dynamic quantile linear model with latent predictors. We extend the univariate DRQS to a multivariate setting – factor DRQS (FDRQS) – by introducing a time-varying latent factor structure for the synthesis weights. This allows the model to leverage cross-sectional dependencies and shared information across multiple time series simultaneously. We develop an efficient Markov chain Monte Carlo (MCMC) algorithm for posterior inference, utilizing data augmentation and forward-filtering backward-sampling. Empirical applications to US inflation and global GDP growth demonstrate the improved performance of the proposed methods for quantile forecasting. In particular, FDRQS exhibits superior resilience during periods of extreme economic stress, such as the COVID-19 pandemic, by adaptively rebalancing agent contributions and capturing emergent global dependencies.

Bayesian additive regression tree copula processes for scalable distributional prediction

CT

J.M.C. Wenkel[1], M.S. Smith[1], N. Klein[1]

[1]Karlsruhe Institute of Technology, Germany
[2]University of Melbourne, Australia

We show how to construct the implied copula process of response values from a Bayesian additive regression tree (BART) model with prior on the leaf node variances. This copula process, defined on the covariate space, can be paired with any marginal distribution for the dependent variable to construct a flexible distributional BART model. Bayesian inference is performed via Markov chain Monte Carlo on an augmented posterior, where we show that key sampling steps can be realized as those of Chipman et al. (2010), preserving scalability and computational efficiency even though the copula process is high dimensional. The posterior predictive distribution from the copula process model is derived in closed form as the push-forward of the posterior predictive distribution of the underlying BART model with an optimal transport map. Under suitable conditions, we establish posterior consistency for the regression function and posterior means and prove convergence in distribution of the predictive process and conditional expectation. Simulation studies demonstrate improved accuracy of distributional predictions compared to the original BART model and leading benchmarks. Applications to five real datasets with 506 to 515,345 observations and 8 to 90 covariates further highlight the efficacy and scalability of our proposed BART copula process model.

List of Posters

Thursday Session

Heterogeneous g-priors for networks with dyadic covariance structures

R. Behluli[1,2], M. Steel[1], R. Casarin[2]

[1]University of Warwick, United Kingdom
[2]Ca' Foscari University of Venice, Italy

The increasing availability of multivariate data calls for the use of matrix variate models for identi-fying hidden patterns within the data and for predicting the variables of interest. In this paper, we propose a novel regression model for sequences of matrix data with dyadic covariance structure and develop a Bayesian procedure for model selection. We show that it is possible to characterize the dyadic variance-covariance matrix analytically and perform inference and model selection using mixtures of g-priors adapted to accommodate the heterogeneity induced by dyadic covariance. We present some theoretical results and the algorithms used to sample low- and high-dimensional model spaces. We present simulation results and a real data comparison to an established method for dyadic covariance estimation.

Bottom-up Bayesian predictive synthesis for Euro area inflation

P. Greso[1], N. Hauzenberger[1], G. Koop[1], S. McIntyre[1]

[1]University of Strathclyde, United Kingdom

Most inflation forecasting models rely on aggregate measures of inflation and broad macro-eco-nomic variables, yet recent empirical evidence suggests that the bottom-up approach can improve predictive performance. We adopt this approach and produce headline and core inflation density forecasts for the euro area by conducting a Bayesian predictive synthesis (BPS) of subcomponent predictive densities. BPS is a theoretically coherent Bayesian framework for combining density forecasts, based on agent opinion analysis theory, which is also suited to combine densities of variables other than the target. We estimate BPS with both time-invariant and time-varying pa-rameters in the synthesis function, considering agnostic and consumption-basket-weight-informed settings. The component densities are generated by simple yet powerful univariate models, such as autoregressive, unobserved component, and random walk models, each featuring stochastic volatility. Our results clearly support the bottom-up approach. While the conventional structurally weighted model remains competitive, BPS specifications improve over direct aggregate inflation forecasts, particularly for core inflation.

Conformal Bayesian inference and stochastic volatility

M.G. Caputo[1], G. Kastner[1]

[1]University of Klagenfurt, Austria

Bayesian conformal inference is a method to construct confidence regions for a variable

of interest in context of regression or classification, and it is popular in fields like machine learning, since it enables quantification of predictive uncertainty. In addition, it has the potential to be quite useful in dealing with model misspecification. However, this approach assumes exchangeable data which makes it unsuitable, e.g., for time series data that are dominated by heteroskedasticity. We present a modification of Bayesian conformal inference that uses weighted regression to correct stochastic volatility (SV). The weights are calculated by an MCMC algorithm elaborated for estimating SV specific heteroskedasticity. Our method shows promising results both with simulated as well as with historical data. Eventually, we hope to utilize the core of our approach to handle various other kinds of heteroskedasticity such as generalized autoregressive conditional heteroskedasticity (GARCH).

Endogenous selection and spillovers: Bayesian inference for policy-relevant causal effects

D. Trinh[1]

[1]University of Graz, Austria

This paper develops a new econometric framework to identify and estimate policy-relevant causal effects in contexts with endogenous selection into treatment and spillovers in single large networks or spatial settings. In such scenarios, the assumptions of unconfoundedness and the Stable Unit Treatment Value Assumption (SUTVA), commonly maintained in causal inference, are often violated. We introduce a Spillover Roy model that jointly models endogenous treatment selection and outcome determination while allowing spillovers in a form of a low-dimensional exposure mapping to neighbors' treatment status. This structure captures heterogeneity in treatment responses across latent resistance to treatment and across exposure levels. Within this structure, we define policy-relevant effects as contrasts in outcomes across feasible policy regimes and show that total policy impacts decompose into direct effects from own participation and spillover effects from changes in neighbors' treatment exposure. For estimation and inference, we develop Bayesian data-augmentation algorithms that enable efficient computation and coherent uncertainty quantification for causal quantities and policy counterfactuals. We demonstrate the finite-sample performance of the proposed method through Monte Carlo simulations and apply it to evaluate the Opportunity Zones (OZ) program, a U.S. place-based policy designed to stimulate economic development in distressed communities. OZ designation increases housing development directly, but spillover benefits to neighboring non-designated tracts are limited. Counterfactual policy analysis reveals diminishing, and eventually negative, marginal direct gains under large program expansions, while spillover benefits remain insufficient to offset declining direct returns. These findings highlight the importance of accounting for endogenous selection and spillovers in evaluating and redesigning of place-based policies.

Bayesian nonparametric time-series modeling of CPI growth rates via Dirichlet process mixtures with time-BART kernels and SV-ICA volatility

M. Christofidis[1], M. Kalli[1]

[1]King's College London, United Kingdom

Our work develops a Bayesian nonparametric time-series model for Consumer Price Index (CPI) growth rates to capture the heterogeneity, structural changes, non-linear dependence,

and volatility clustering that are present in inflation series. Our novelty is the replacement of the Gaussian kernel in a Dirichlet Process Mixture Model (DPM) with a Bayesian Additive Regression Tree kernel with time lags as covariates. This produces a flexible nonparametric autoregressive mixture model. Each DPM regime has its own intercept, nonlinear BART regression function, cluster-specific variance, and a DART lag selection structure. The model incorporates time-varying volatility through a Stochastic Volatility with Infinite Cross-Sectional Aggregation (SV-ICA) block. This allows persistence to be represented through a mixture of AR(1) components and divided into different memory blocks. We apply our model to Swiss monthly CPI growth rates, using the previous 24 months as covariates. Empirical results indicate that our model improves predictive performance and interpretability relative to standard Bayesian nonparametric benchmarks. Specifically, the produced cluster structure provides valuable information about the relevant lag effects within each regime. The model offers a flexible framework for modeling inflation dynamics where nonlinear dependence, heterogeneity, and evolving volatility are the main features.

Estimation of correlation matrices via Gaussian copula models

Y. Chen[1]

[1]King's College London, United Kingdom

This poster presents a Bayesian framework for estimating correlation matrices using Gaussian copula models, with a focus on handling mixed data types and incorporating covariate effects. Copula models provide a principled way to separate marginal distributions from dependence structure, allowing flexible modelling of multivariate data without restrictive joint distributional assumptions. By transforming observed variables into a latent Gaussian space, the dependence is captured through a correlation matrix, while the marginals can be specified either nonparametri-cally or parametrically. We consider parametric marginals with covariate-dependent structures and develop an efficient Markov chain Monte Carlo (MCMC) scheme for posterior inference. In particular, we employ a preconditioned Metropolis-adjusted Langevin algorithm (MALA) to update regression coefficients, leveraging gradient information to improve convergence and mixing in moderate to high dimensions. For discrete marginals, latent variables are sampled using truncated Gaussian distributions, enabling coherent integration of non-Gaussian observations within the copula framework. Simulation studies demonstrate accurate recovery of the underlying correlation structure, along with stable convergence of both correlation parameters and regression coefficients. The methodology is further illustrated on a health-care utilisation dataset, highlighting its ability to capture complex dependence patterns across multiple count outcomes while accounting for covari-ates. Overall, the proposed framework provides a flexible and computationally efficient approach for modelling dependence in multivariate data. Ongoing work explores extensions incorporating Bayesian nonparametric random effects to better capture unobserved heterogeneity and enhance flexibility in the marginal distributions.

Improving model-based clustering of matrix-variate data with shrinkage priors

G. Malsiner-Walli[1], B. Grün[1], S. Frühwirth-Schnatter[1]

[1]Vienna University of Economics and Business, Austria

Matrix-variate data is obtained if for each observational unit a matrix is observed, e.g., if several vari-ables are observed over a fixed grid of time points for an individual. This results

in a data structure of three different layers or modes (e.g., units, variables and time points). In the context of model-based clustering, the analysis of matrix-variate data poses challenges even in moderate-dimensional settings due to the high dimensionality of the parameters. Within a Bayesian framework, we pro-pose a mixture of finite mixtures of matrix-normal distributions modeling approach which aims at determining a suitable number of clusters in a straightforward approach while assessing sparsity in the mean specification by performing row- and column-wise variable selection. This sparse Bayesian approach relies on the specification of shrinkage priors to estimate the number of clusters and identify cluster-relevant rows and columns (e.g., variables and time points) simultaneously. Specifically, we specify a sparsity inducing hierarchical prior on the cluster mean matrices which allows component mean matrices to be pulled together selectively for specific rows or columns. The pulling together implies that the clusters and hence the observations are homogeneous in this row or column (i.e., time point or variable). This avoids overfitting heterogeneity, resulting in more precise estimates of the component mean matrices. We illustrate this modeling approach using panel data of insurance consumption across Italian provinces.

Friday Session

Bayesian sequential learning under non-stationarity

S. Cuonzo[1], N. Deliu[1]

[1]Sapienza University of Rome, Italy

We develop a unified Bayesian framework for sequential inference under non-stationarity, based on weighted posterior updates. The methodology is formulated within the conjugate Normal-Inverse-Wishart prior-posterior framework. We show that it yields closed-form updates while accommodating evolving data-generating mechanisms. Several non-stationary scenarios arise as special cases, including sliding-window, exponential discounting, soft-window memory, Gaussian temporal kernels, and latent-state-dependent learning. Finally, standard Bayesian computation arises as a special case in the stationary scenario. We then show the applicability of the framework in two sequential decision problems. First, we derive non-stationary variants of Thompson Sampling[3] for the Gaussian multi-armed bandit problem. Then, we consider a non-stationary extension of the robust Bayesian mean-variance portfolio allocation problem introduced by Meucci. Specifically, we embed posterior uncertainty sets derived from the weighted multivariate posterior into a second-order cone formulation of the robust portfolio allocation problem. An empirical study on a diversified set of large-cap U.S. equities drawn from the S&P 500 shows that time-adaptive posterior updates systematically outperform the stationary benchmark, with discounting and Gaussian-kernel specifications achieving the strongest risk-adjusted performance. Overall, the results highlight that non-stationary Bayesian learning provides a principled and computationally efficient extension of classical conjugate models for dynamic environments. Further work shall investigate the proposed framework for models without conjugacy.

Quasi-Bayesian hierarchical models

D. Fairall[1], T. Glinnan[2]

[1]University of Warwick, United Kingdom
[2]London School of Economics and Political Science, United Kingdom

Applied Bayesian econometricians often want to pool information across sites, markets, studies, or countries, while retaining the within-group estimator that is credible for the application. That estimator is frequently not likelihood-based: it may be IV, GMM, minimum distance, nonlinear least squares, or a computational structural criterion. We propose Quasi-Bayesian Hierarchical Models (QBHMs), a generalized-Bayes framework that starts from the criterion used for separate grouplevel estimation and adds an upper-level pooling criterion for the group effects. The construction nests ordinary hierarchical Bayes when the two criteria are log likelihoods, but it also applies when the lower level is a standard econometric objective function rather than a parametric sampling model. The main theoretical message is identification-adaptive pooling. With a fixed number of groups and large within-group samples, a fixed hierarchical pooling term is asymptotically negligible for coordinates that are strongly identified by the within-group criterion. The same pooling term enters the first-order decision problem for weakly or partially identified coordinates. In grouped GMM and weak-IV designs this distinction yields explicit posterior-mean and risk formulas: pooling has no first-order cost when within-group curvature is large, while modest pooling can reduce local risk when curvature is weak. The framework gives posterior means for observed groups, predictive rules for new groups, and a transparent regularization path in a pooling parameter λ.

A structural matrix autoregressions framework for international spillovers

I. Moreira Lara[1], J. Prüser[2], C. Hanck[1]

[1]University of Duisburg-Essen, Germany
[2]TU Dortmund, Germany

Structural identification in Vector Autoregression models faces a fundamental challenge: the number of structural restrictions required to identify shocks proliferates rapidly as the number of variables and their interactions increase. This becomes particularly acute when extending to multi-country settings where country-specific shocks must be separately identified. Existing approaches in the literature either require an impractical number of restrictions or impose restrictive assumptions that limit their applicability to large-scale multi-country problems. We propose Bayesian Structural Matrix Autoregressions (BSMAR), a novel framework that solves these limitations by exploiting a bilinear matrix structure to jointly identify shocks originating from different countries while reducing the number of required structural restrictions. The approach incorporates economically meaningful restrictions and employs efficient sampler methods to address the high dimension nature of the data. We demonstrate the method's capabilities through an empirical application in which we simultaneously identify a 30 supply and demand shocks using data from OECD and key partner countries. The application recovers sensible impulse responses and reveals strong levels of connectedness across countries. We derive connectivity measures to quantify the magnitude of international spillovers and highlight the model's ability to capture shock transmission in a parsimonious yet interpretable way. We also provide possible extensions that relax restrictive assumptions in the baseline model.

A Bayesian Gaussian process dynamic factor model

N. Hauzenberger[1], T. Chernis[1], H. Mumtaz[2], M. Pfarrhofer[3]

[1]University of Strathclyde, United Kingdom
[2]Queen Mary University of London, United Kingdom
[3]Vienna University of Economics and Business, Austria

We propose a dynamic factor model (DFM) where the latent factors are linked to observed variables with unknown and potentially nonlinear functions. The key novelty and source of flexibility of our approach is a nonparametric observation equation, specified via Gaussian Process (GP) priors for each series. Factor dynamics are modeled with a standard vector autoregression (VAR), which facilitates computation and interpretation. We discuss a computationally efficient estimation algorithm and consider two empirical applications. First, we forecast key series from the FRED-QD dataset and show that the model yields improvements in predictive accuracy relative to linear benchmarks. Second, we extract driving factors of global inflation dynamics with the GP-DFM, which allows for capturing international asymmetries.

WNowcasting with heavy-tailed mixed-frequency vector utoregression models

S. Karlsson[1], S. Mazur[1], H. Nguyen[2]

[1]Örebro University, Sweden
[2]Linköping University, Sweden

The mixed-frequency vector autoregression (MF-VAR) model has become a workhorse for now-casting low-frequency macroeconomic variables using the most recent releases of information on related high-frequency variables. However, assuming Gaussian innovations may lead to poor per-formance in the presence of outliers. In this paper, we propose an MF-VAR model with orthogonal Student's t distributions that account for individual outliers in each VAR equation. Using US data in a small VAR setting, we show that the heavy-tailed distribution delivers more accurate nowcasts and forecasts of quarterly GDP growth. It also improves the nowcasting of monthly variables and reduces the impact of contaminated estimates caused by the extreme observations during the Covid-19 pandemic.

Modeling university outcomes: A hidden Markov model approach

E. Pandolfo[1], N. Deliu[1], B. Liseo[1], A. Tancredi[1]

[1]Sapienza University of Rome, Italy

In this paper, we propose a hidden Markov model to investigate late graduation and dropout outcomes for university students by accounting for latent activity and inactivity periods in their careers. Data are based on the whole cohort of University La Sapienza students at the faculty of Economics enrolled in the academic year 2017/18. Model estimation is performed via a Bayesian approach. A Gibbs sampler algorithm is used to produce posterior estimates.

A Bayesian synthetic control approach for trend-cycle decompositions of poten-tial outcomes

X. Yu[1]

[1]Fudan University, China

Standard Synthetic Control Methods (SCM) match pre-treatment averages, underutilizing temporal order and nonstationary panel dynamics. We propose a Bayesian Synthetic Control approach with Unobserved Components (BSC-UC) that decomposes outcomes into unit-specific latent trends and synthesized cyclical components. Unlike two-step estimators, our unified Bayesian framework jointly estimates all components in one step, avoiding propagated uncertainty and delivering coher-ent posterior credible intervals. We also introduce model comparison tools for trend specification assessment. Simulations and empirical applications show that our method improves counterfactual accuracy by capturing temporal structures, indicating that explicit trend-cycle modeling benefits many conventional SCM applications

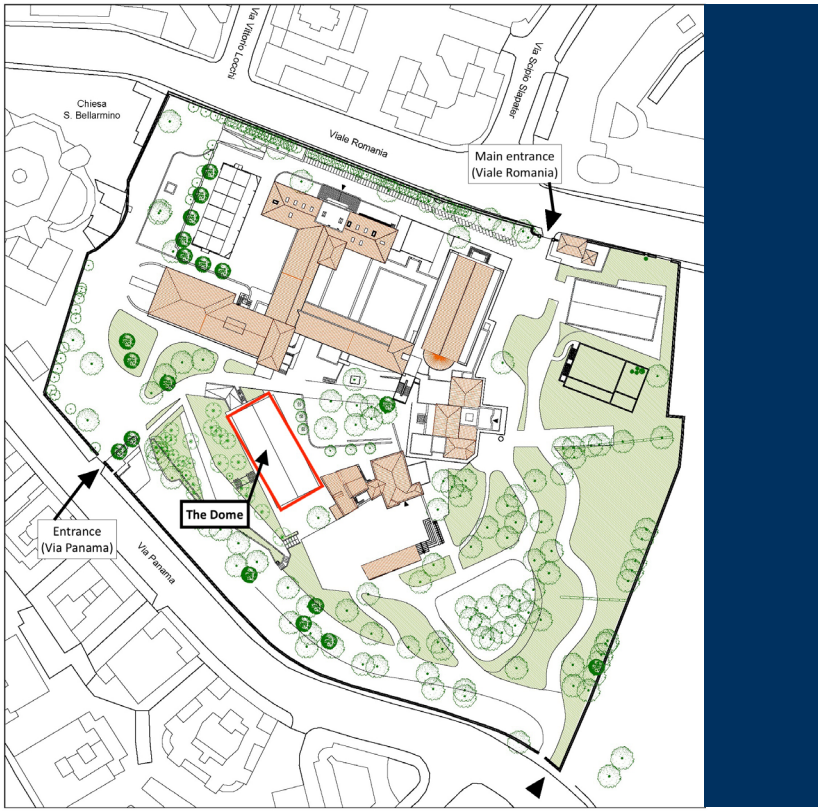
List of Partecipants

Rafael Alcantara	Austin, United States
Lina Arustamyan	Wien, Austria
Conception Ausìn	Madrid, Spain
Rigers Behluli	Warwick, United Kingdom
Lukas Berend	Hagen, Germany
Daniele Bianchi	London, United Kingdom
Cem Cakmakli	Durham, United Kingdom
Annika Camehl	Rotterdam, The Netherlands
Radu Craiu	Toronto, Canada
Mario Giuseppe Caputo	Klagenfurt, Austria
Roberto Casarin	Venice, Italy
Yiyan Chen	London, United Kingdom
Marios Christofidis	London, United Kingdom
Hyun Jae Stephen Chu	Notre Dame, France
Simone Cuonzo	Rome, Italy
Petros Dellaportas	London, United Kingdom; Athens, Greece
Martin Fankhauser	Milan, Italy
Nicholas Fritsch	Cleveland, United States
Luca Gherardini	Klagenfurt, Austria
Thomas Glinnan	London, United Kingdom
Stefano Grassi	Rome, Italy
Petra Greso	Barcelona, Spain
Jim Griffin	London, United Kingdom
Luis Gruber	Klagenfurt, Austria
Dongu Han	Chiyoda, Japan
Niko Hauzenberger	Glasgow, United Kingdom
Ivan Jeliazkov Irvine	United States
Maria Kalli London	United Kingdom
Karlsson Örebro	Sweden
Sylvia Kaufmann	Gerzensee, Switzerland
Genya Kobayashi	Chiyoda, Japan
Gertraud Malsiner-Walli	Wien, Austria
Igor F. B. Martins	Örebro, Sweden
James Mitchell	Cleveland, United States
Ignacio Moreira Lara	Duisburg-Essen, Germany
Andriy Norets	Providence, United States
Edoardo Pandolfo	Rome, Italy
Stefano Peluso	Milan, Italy

Antonio Peruzzi	Venice, Italy
Tobias Scheckel	Wien, Austria
Maximilian Schröder	Frankfurt, Germany
Nil Taspinar	Istanbul, Turkey
Duong Trinh	Graz, Austria
Sofia Velasco	Madrid, Spain
Jan Martin Carl Wenkel	Karlsruhe, Germany
Mike West	Duke, United States
Patrick Woitschig	Duke, United States
Xuewen Yu	Fudan, China
Callum Wu	London, United Kingdom
Martina Danielova Zaharieva	Madrid, Spain

Useful Information

The conference will be held in the Luiss campus at Viale Romania 32, 00197 Rome. There are two entrances to the campus, one from Viale Romania (main) and another from Via Panama.



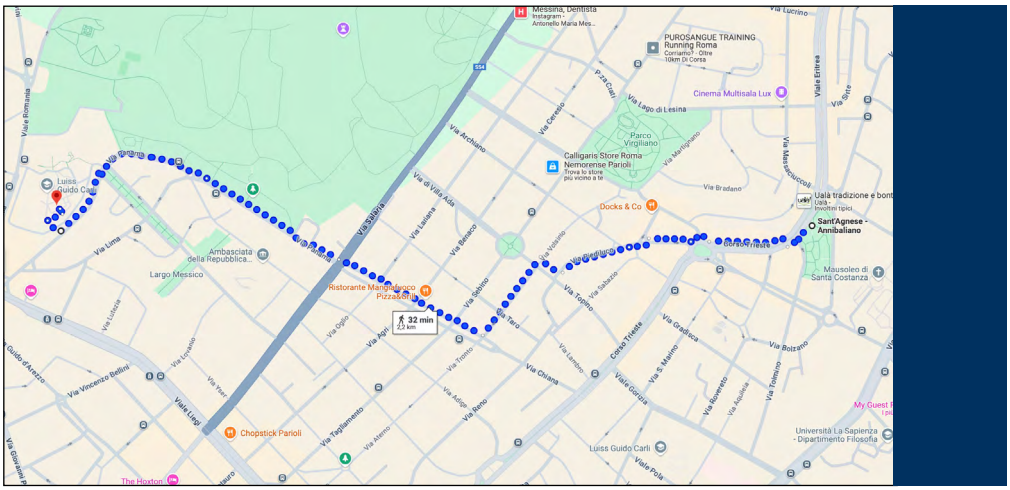
How to get to Luiss?

• By Plane
From Fiumicino airport, take the Leonardo Express or a shuttle bus to Rome Termini train station. Instead, from Ciampino airport, take a shuttle bus to Rome Termini train station and follow the instructions below.

• By Train or Bus
If you come from Rome Termini Station, you can take a bus from Piazza dei Cinquecento (th main bus station in front of Termini Train Station). You may take line 360 to Romania stop, or 223 to Parioli/Ungheria stop (Maps link).
If you travel by bus, notice that the closest bus stops to Luiss campus are Romania and Parioli/Ungheria.

• By Metro

The closest metro station to Luiss campus is Sant'Agnese - Annibaliano (B), which is 30 minutes' walking distance from the campus (Maps link).



Summary

Talks will be held in the lecture theatres **AT01** and **AT02**, which are situated on the ground floor of the main building of the campus.

Coffee breaks and lunches will be offered in the university canteen, at the first floor of the same building of the conference rooms.

The **poster sessions** will be held on Thursday and Friday during and right after lunch, in the same room. However, the posters can be put up and discussed already during coffee breaks.

Wi-Fi will be available by accessing the eduroam network (see eduroam.org).

The **conference dinner** will be at 20:15 (on Thursday 27th August at "Cascianese Country Club" (better known as "il maneggio di Villa Ada"), within the beautiful Parco di Villa Ada (address: Via Salaria 267, Rome).

To get to the place, you should enter Villa Ada from the gate at Via Salaria 265C (at the corner with Via di Villa Ada). The walk from the Luiss campus to the gate is (+ minutes, even less from Hotel Buenos Aires. From the gate, there is a 10-15 minute walk (1.2km) insidethe villa.

We suggest that we all meet at 20:00 at the Villa Ada gate and then walk together to the place. If you are lost inside the villa, ask somebody about "il maneggio" or search "*Cascianese Country Club*" on Google Maps. Worse comes to worst, call one of the organisers and we will come rescue you.

For **further info** and enquiries, please e-mail esobe2026@gmail.com

Suggested hotels

Several hotels and bed&breakfasts are located around Luiss campuses of Viale Romania (main conference venue) and Viale Pola (conference dinner). The following is a sample of possible hotels in the neighbourhood.

3-star hotels

- Hotel Buenos Aires
- Suite Oriani
- Le Tre Suites (Via delle 3 Madonne)
- Parioli place
- Hotel delle Muse

4-star hotels

- Hotel degli Aranci
- Hilton Garden Inn Rome Claridge
- The Hoxton Rome
- Parioli Cube Hotel

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The ESOBE conference and junior travel awards are supported by the following sponsors.

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ISBA Section on Economics, Finance and Business (EFaB)

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