Universidad de Navarra

Finance III (MEF)

Guía docente 2025-26

PRESENTACIÓN

Breve descripción: This course delves into the intricate world of financial econometrics, with a special focus on the interplay between macroeconomic variables and financial indicators. Our primary objective is forecasting. By the end of this course, participants will be equipped to develop their own sophisticated forecasting methods, akin to those employed by seasoned professionals.

Our unique approach addresses the nitty-gritty details that students encounter in their professional journeys—details often overlooked in standard academic econometric classes. These include:

Seasonal Adjustment: Understanding and accounting for seasonal patterns in data.

Handling Missing Data: Strategies for dealing with gaps in data.

Mixed Frequencies: Tackling data with varying time intervals.

Non-Stationarity: Recognizing and addressing non-stationary time series.

Non-Linearities: Grasping nonlinear relationships in financial data.

Time-Varying Relations: Analyzing dynamic changes in relationships over time.

While we emphasize techniques, we go a step further: students are encouraged to code their own computer programs from scratch. This hands-on approach ensures that they comprehend every nuance of the methods they employ. From meticulous data reading and transformation to utilizing state-of-the-art techniques for analysis and forecasting, students gain a comprehensive understanding.

We cover both classical and Bayesian methods, fostering flexibility in tackling the diverse challenges they'll encounter in their professional careers.

- **Titulación**: Master in Economics and Finance
- **Módulo/Materia**: Module I/Matter 1.2 Finance
- **ECTS**: 3,5 (87.5 hours of work)
- **Curso, semestre**: Spring, 2023/2024
- **Carácter**:
- **Profesorado**: Gabriel Perez Quirós and Danilo Leiva León
- **Idioma**: English
- **Aula, Horario**: Schedule on Web (link to the web)

RESULTADOS DE APRENDIZAJE (Competencias)

GENERAL COMPETENCIES

CG1) Train high-level specialists in both economic theory and finance

CG2) Provide students with the appropriate and necessary mathematical and econometric techniques for both theoretical and empirical work in the fields of economic theory and finance.

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CG3) Familiarize students with research fields and the most relevant literature in economic theory and finance

CG4) Develop students' critical capacity towards economic or financial phenomena and enhance their communication skills.

CG5) Provide students with the basic theoretical foundations to start doctoral studies in economics or finance.

SPECIFIC COMPETENCIES

CE4) Handle the main statistical and econometric programs used in the areas of economics and finance.

CE6) Understand the foundations of modern financial theory through discrete-time models examining the decision-making process under uncertainty in an intertemporal framework, mean-variance theory, arbitrage theory, and the incorporation of information in the decision-making process

CE7) Examine the concept of market risk using models for its assessment

PROGRAMA

Instructor: Gabriel Pérez Quirós

Course Outline

1. Nowcasting with linear balanced datasets.

- VARs and structural VARs
- Dynamic factor models. Kalman filter
- Economic Application: Inferring current state of the economy, creating a coincident index

2. The devil is in the details. Unbalanced dataset

- Mixed frequency, ragged ends, missing data and seasonal adjustment.
- Enlarging VAR and dynamic factor models to unbalanced dataset
- Economic Application: Inferring current state of the economy, creating a coincident index with all data-related isues.

2. Non-linear specifications. Univariate,

- Markov Switching Models.
- Threshold Models
- Modelling variance. Arch and Garch models.
- Value at Risk. Quantile regressions.
- Economic Application: Credit and the Business Cycle. Great Moderation. Growth at Risk

2. Non-linear specifications. Multivariate,

- Dynamic factor models with nonlinear changes in regime
- Non-linear dynamic factor models with time varying parameters
- Economic Application: Inferring turning points in real time.

Instructor: Danilo Leiva-Leon

Course Outline

1. Bayesian Liner Regression

- Introduction to Bayesian Econometrics
- Forecasting with Bayesian methods
- Economic Applications: Forecasting inflation

1. Bayesian State Space Models

- Carter and Kohn Algorithm
- Dynamic Factor Models: A Bayesian Perspective
- Economic Applications: Measuring the strength of the economic activity

1. Bayesian Regime-Switching Models

- Kim and Nelson Algorithm
- Markov-Switching and the Kalman Filter: A Bayesian Perspective
- Economic Applications: Inferring recessions

1. Stochastic Volatility Models

- Kim, Shephard and Chib Algorithm
- Linear regressions subject to stochastic volatility
- Economic Applications: Modelling the volatility of exchange rate

ACTIVIDADES FORMATIVAS

Standard in-person lectures including both theory and practice with exercises (problem sets)

EVALUACIÓN

CONVOCATORIA ORDINARIA

30% PS

Universidad de Navarra

70% final exam

CONVOCATORIA EXTRAORDINARIA

30% PS

70% final exam

HORARIOS DE ATENCIÓN

By email

BIBLIOGRAFÍA

Books that contain important part of the material:

1. James Hamilton. "Time Series Analysis" Princeton. (1994). Localízalo en la biblioteca.

2. Chang-Jin Kim, Charles R. Nelson. "State-Space Models with Regime Switching: Classical and Gibbs-Sampling Approaches With Applications". MIT Press (1999). Recurso online.

3. Andrew Blake and Haroon Mumtaz. "Applied Bayesian Econometrics for Central Bankers" (2007). Bank of England.

4. Helmut Lütkepohl "New Introduction to Multivariate Time Series Analysis". (2005). Localízalo en la biblioteca.

5. Fabio Canova." Methods for Applied Macroeconomic Research" (2007) Recurso online.

6. Koop G. and D. Korobilis (2009). "Bayesian Multivariate Time Series Methods for Empirical Macroeconomics." Fundations and Trends in Econometrics, 3 (4), 267-358.

Additional bibliography:

Many articles will be analyzed during the course, either totally or partially. A list of reading corresponding on each topic will be handled to the students before the topic is covered in class.

1. Bayesian State Space Models

Bernanke B., Boivin J., and P. Eliasz (2005). "Measuring the Effects of Monetary Policy: A Factor-Augmented Vector Autoregressive (FAVAR) Approach," The Quarterly Journal of Economics, 120 (1), 387–422.

Carter, C. K. and P. Kohn (1994). "On Gibbs Sampling for State Space Models." Biometrika, 81, 541-553.

Durbin, J. and S. J. Koopman (2002). "A simple and efficient simulation smoother for state space time series analysis." Biometrika, 89, 603–615.

Kim C. K., C. R. Nelson (1999). "State-Space Models with Regime Switching: Classical and Gibbs-Sampling Approaches with Applications." MIT Press. (Chapter 8)

Koop, G. and D. Korobilis (2012). “Forecasting inflation using dynamic model averaging.” International Economic Review, 53 (3), 867–886.

2. Bayesian Regime-Switching Models

Chauvet, M. and J. Piger (2008). “A Comparison of the Real-Time Performance of Business Cycle Dating Methods.” Journal of Business Economics and Statistics, 26 (1), 42-49.

Chauvet, M., Leiva-Leon D. and W. A. Barnette (2016). “Real-Time Nowcasting Nominal GDP Under Structural Breaks.” Journal of Econometrics, 191 (2), 312-324.

Ductor L. and D. Leiva-Leon (2016). “Dynamics of Global Business Cycle Interdependence.” Journal of International Economics, 102, 110-127.

Guerín and Leiva-Leon (2017). “Monetary Policy, Stock Market and Sectoral Comovement.” Bank of Spain Working Paper, 1731.

Kim C. K., C. R. Nelson (1999). “State-Space Models with Regime Switching: Classical and Gibbs-Sampling Approaches with Applications.” MIT Press. (Chapter 9)

Hubrich, K. and R. J. Tetlow. (2015). “Financial stress and economic dynamics: The transmission of crises.” Journal of Monetary Economics, 70 (C), 100–115.

Sims, C. A. and T. Zha. (2006). “Were There Regime Switches in U.S. Monetary Policy?” American Economic Review, 96 (1), 54–81.

Kim, C. J. and C. Nelson (1998). “Business Cycle Turning Points, a New Coincident Index, and Tests of Duration Dependence Based on Dynamic Factor Model with Regime-Switching,” Review of Economics and Statistics, 80 (2), 188-201.

Leiva-Leon D. (2014). “Real vs. Nominal Cycles: A Multistate Markov-Switching Bi-Factor Approach.” Studies in Nonlinear Dynamics and Econometrics, 18 (5), 557-580.

Leiva-Leon D. (2017). “Measuring Business Cycles Intra-Synchronization in US: A Regime-Switching Interdependence Framework.” Oxford Bulletin of Economics and Statistics, 79 (4), 513-545.

Sims, C. A., Waggoner, D. F., and T. Zha. (2008). “Methods for inference in large multiple equation Markov-switching models.” Journal of Econometrics, 146 (2), 255–274.

3. Stochastic Volatility Models

Clark, T. E. (2011). “Real-time density forecasts from Bayesian vector autoregressions with stochastic volatility.” Journal of Business and Economic Statistics, 29 (3), 327–341.

Chan, J. (2013). “Moving average stochastic volatility models with application to inflation forecast.” Journal of Econometrics, 176 (2), 162–172.

Chan J. and C. Hsiao (2014). “Estimation of Stochastic Volatility Models with Heavy Tails and Serial Dependence.” Bayesian Inference in the Social Sciences, 159-180, John Wiley & Sons, Hoboken, New Jersey.

Leiva-Leon D. and L. Ductor (2018). “Fluctuations in Global Macro Volatility.” Bank of Spain Working Paper, Forthcoming.

Kim, S., Shepherd, N. and S. Chib (1998). “Stochastic volatility: Likelihood inference and comparison with ARCH models.” Review of Economic Studies, 65 (3), 361–393.

Mumtaz, H. and F. Zanetti (2013). “The impact of the volatility of monetary policy shocks.” Journal of Money, Credit and Banking, 45 (4), 535–558.

Primiceri G. (2005). “Time Varying Structural Vector Autoregressions and Monetary Policy.” The Review of Economic Studies, 72 (3), 821–852.