Freie Universität Berlin
School of Business and Economics

(A) 6 ECTS Master Seminar: 10143009 **Recent Research in Econometrics**

—

(B) 2nd part of the 12 ECTS course **Methods in Empirical Economics**

Wintersemester 2022/23

Sven Schreiber, Lars Winkelmann

In this seminar, you work on applied or methodological projects in Financial or Macro Econometrics. You will broaden your background acquired during the (mandatory) lectures *104007–Econometric Analysis* and either *104116–Multivariate Time Series Analysis* or *101426–Financial Econometrics*.

If the study regulations for the Economics Master program as of WiSe 12/13 apply to you or you are a Master of Statistics student, you pick (A). If you study under the new regulations for the Economics Master program as of WiSe 21/22, you can choose (B), with *104116–Multivariate Time Series Analysis* being the first part of the module *Methods in Empirical Economics*.

Seminar Projects: (A) We provide a list of topics from which you can choose. The topics are not worked out in detail. We just give some initial references. You can work on methodological aspects or run an empirical application. Even in case of an empirical project, you have to acquire the relevant aspects of a model class and associated inference procedures. A methodological project should also contain a brief empirical illustration (or simulation when more appropriate). Besides the list of topics, you are more than welcome to propose your own topic. In this case please contact us before our first meeting in October. (B) You continue working on your final project from the 1st part of the module.

Structure: In the first session we will make some general remarks on the seminar and we discuss the project allocation. In preparation of the fist meeting you need to check the list of seminar topics on our blackboard page and already take a closer look at some references. We highly recommend to work in groups of two students—so find a partner beforehand. After the first meeting each group has to officially register for the seminar and confirm the assigned research topic via mail. The following weeks are reserved for individual meetings. (A) In the week before the Christmas break, we have our second joint session with short presentations and feedback. (B) In case you already started working on your VAR project, you may present earlier (mid Novermber). Each group presents briefly (about 15 minutes) its topic to the fellow students. You give the (economic) motivation, explain the methodology and what you plan to do. In the following weeks you continue working on the empirics/simulations. Our final joint meeting is end of January. After a brief reminder about the topic each group presents its empirical or simulation results (with about 15 minutes presentation time). Since you should have a chance of considering the feedback to your presentations, you can submit the seminar paper until mid of March. Each group submits one seminar paper of not more than 15 pages.

Grading: The seminar paper will be weighted with 80% and both presentations with 20%. The usual grades are applied to these three parts of the examination.

Important dates:

- Introductory meeting: Thursday 20. Oct. 2022, 14:30:16:00 (315).
- Registration deadline: 3. Nov. 2022 via mail (without this extra registration no grading).
- First presentation: Thursday 15. Dec. 2022, 14:30-18.00 (K005).
- Second presentation: Tuesday 26. Jan. 2023, 14:30-18.00 (K005).
- Paper submission: 10. March 2023 via mail (including documented code, data, tex-file).

Topics:

1. Financial and Macroeconomic Risk: Volatility, Value at Risk, Expected Shortfall.

   (a) Volatility predictions with **GAS models**.

   D. Creal, S. J. Koopman, and A. Lucas. Generalized autoregressive score models with applications. Journal of Applied Econometrics, 28(5):777–795, 2013.

   D. Ardia, K. Boudt, L. Catania. Value-at-Risk Prediction in R with the GAS Package. arXiv:1611.06010, 2016.

   E. Lazar, X. Xue. Forecasting risk measures using intraday data in a generalized autoregressive score framework. International Journal of Forecasting 36, 1057–1072, 2020.

   (b) Volatility predictions with models including **intraday data**.

   F. Corsi. A simple long memory model of realized volatility. Journal of Financial Econometrics 7, 174–196, 2009.

   N. Shephard, K. Sheppard. Realising the future: forecasting with high-frequency-based volatility (HEAVY) models. Journal of Applied Econometrics, 25: 197–231, 2010.

   L. Y. Liu, A. J. Patton, K. Sheppard. Does anything beat 5-minute RV? A comparison of realized measures across multiple asset classes. Journal of Econometrics 187, 293–311, 2015.

   (c) **Forecast evaluation**.

   A. J. Patton. Comparing Possibly Misspecified Forecasts. Journal of Business & Economic Statistics, 38:4, 796–809, 2020.

   A. J. Patton. Volatility forecast comparison using imperfect volatility proxies. Journal of Econometrics 160, 246–256, 2011.

   F. X. Diebold. Comparing Predictive Accuracy, Twenty Years Later: A Personal Perspective on the Use and Abuse of Diebold–Mariano Tests, Journal of Business & Economic Statistics, 33:1, 1-1, 2015.

   A. J. Patton, J. F. Ziegel, R. Chen. Dynamic semiparametric models for expected shortfall. Journal of Econometrics 211, 388–413, 2019.

   P. R. Hansen, A. Lunde. A forecast comparison of volatility models: does anything beat a GARCH(1,1)? Journal of Applied Econometrics 20, 873–889, 2005.

(d) Growth at risk: **GaR**.

A. Carriero, T. E. Clark, M. Marcellino. Nowcasting tail risk to economic activity at a weekly frequency. Journal of Applied Econometrics 37, 5, 843–866, 2022.

Adrian, Tobias, Federico Grinberg, Nellie Liang, Sheheryar Malik, and Jie Yu. The Term Structure of Growth-at-Risk. American Economic Journal: Macroeconomics, 14 (3): 283–323, 2022.

L. Ferrara, M. Mogliani, J.-G. Sahuc. High-frequency monitoring of growth at risk. International Journal of Forecasting 38, 582–595, 2022.

2. Portfoliomanagement: Covariance matrices.

(a) Covariance matrix estimation using **high-dimensional, high-frequency data**.

Y. Aït-Sahalia, D. Xiu. Using principal component analysis to estimate a high dimensional factor model with high-frequency data. Journal of Econometrics 201, 384–399, 2017.

J. Fan, A. Furger, D. Xiu. Incorporating Global Industrial Classification Standard Into Portfolio Allocation: A Simple Factor-Based Large Covariance Matrix Estimator With High-Frequency Data. Journal of Business & Economic Statistics, 34:4, 489–503, 2016.

N. Hautsch, L. M. Kyj, P. Malec. Do High-Frequency Data Improve High-Dimensional Portfolio Allocations? Journal of Applied Econometrics 30, 263–290, 2015.

J. Fan, Y. Fan, J. Lv. High dimensional covariance matrix estimation using a factor model. Journal of Econometrics 147 (2008) 186–197, 2008.

(b) Minimum variance portfolios with **copular models** and **jumps**.

R. Garcia, G. Tsafack. Dependence structure and extreme comovements in international equity and bond markets. Journal of Banking & Finance 35, 1954–1970, 2011.

Q Liu. On Portfolio Optimization: How and When Do We Benefit from High-Frequency Data? Journal of Applied Econometrics 24, 560–582, 2009.

A. J. Patton. On the Out-of-Sample Importance of Skewness and Asymmetric Dependence for Asset Allocation. Journal of Financial Econometrics 2, 130–168, 2004.

T. Bollerslev. T. H. Law. G. Tauchen. Risk, jumps, and diversification. Journal of Econometrics 144, 234–256, 2008.

Some helpful R packages: For covar estimation: yuima, for vola models: highfrequency