Course Title: Local Projection methods for applied economics

Instructor: Òscar Jordà

Dates: October 21—23, 2024 (9.00 am to 13.00 pm.)

Intended for
Academic researchers and policy analysts who are interested in local projection methods and their application. Applications are primarily but not exclusively geared toward macroeconomics data.

Prerequisites
Some basic knowledge of probability or statistics is expected. Individuals with undergraduate degrees in economics, statistics, or related disciplines should be able to follow the course. The emphasis will be in applications and practical aspects rather than on deep theory. The applications will use the statistics software package STATA.

Overview
A convenient way to estimate how a variable responds to a given intervention over time is with the method of local projections. A local projection is a regression of an outcome variable observed in the future, on an intervention variable today, conditional on controls observed today or earlier. In linear settings, this simple approach results in estimates of impulse responses that are asymptotically equivalent to those obtained from vector autoregressions (VAR) under standard regularity assumptions. However, because local projections rely on single equation methods, they have quickly become a popular tool in large dimensional, longitudinal, and nonlinear data settings. Moreover, local projections provide a natural nexus with the policy evaluation literature in applied microeconomics. This opens up interesting complementarities.

The goal of the course is to briefly discuss VAR-based methods, and quickly pivot to discuss local projections. We will explore the basic statistical properties of current estimators and inferential methods before moving on to issues of identification. These include basic control (such as inverse propensity score weighting), and instrumental variable approaches. Next, we will tackle the issue of decomposing the impulse response into its constituent components using the Kitagawa-Oaxaca-Blinder decomposition. This decomposition will allow us to investigate nonlinearities and time-varying extensions that are nevertheless linear in the parameters and therefore estimable by standard least-squares methods. We will also see methods to estimate and evaluate policy in a practical manner. Finally, we investigate panel data applications. In particular, we analyze situations where identification is achieved using difference-in-differences settings.

The breadth of topics covered limit the rigor with which each result will be discussed, though appropriate references will be provided for those interested. The goal of the course is to guide practitioners to appropriate methods for their problems, and to elicit fruitful extensions and avenues for new research.

Course Outline (October 21-23)

09.00-09.30: Accreditation
09.30-11.00: **Lecture**
11.00-11.30: Break
11.30-13.00: **Lecture**

Topics

1. Introduction to vector autoregressions, and estimation of impulse responses. Equivalence of local projection estimates of impulse responses. Multipliers.

2. Identification approaches for causal interpretation of impulse responses.

3. Inference results for local projections.

4. Smoothing of impulse response estimates. Economic interpretation and inference.

5. Matching methods for estimation of structural models. Evaluation of policy outcomes.

6. Stratification and the Kitagawa decomposition.

7. Panel data methods. Micro effects with macro shocks. Difference-in-difference estimation.

Short Bio

Òscar Jordà is a Senior Policy Advisor at the Federal Reserve Bank of San Francisco and Professor of Economics at the University of California, Davis. He earned his doctorate at the University of California, San Diego. He is the founding Chair of the Spanish Business Cycle Dating Committee and currently serves as a member. In addition, he is a member of the Center for Economic Policy Research. His research focuses on time series econometrics with applications in macroeconomics, economic history and finance. He has published in international journals such as the American Economic Review, Journal of Political Economy, Quarterly Journal of Economics, Journal of the European Economic Association and International Economic Review. He is a co-editor of the International Journal of Central Banking, and associate editor of the Journal of International Economics, and the Journal of Applied Econometrics. He previously served in the editorial boards of the Journal of Business and Economic Statistics, the Journal of Econometric Methods, Empirical Economics, and the Journal of the Spanish Economic Association.