

CEF 2018 Pre-conference Workshop

## **Macroeconomic Modeling of Regime Switches using the RISE Toolbox**

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9:00 a.m. to 4:30 p.m.

Regime switches are ubiquitous. The past decade has reminded us, among other things, that the behavior of the economic system can drastically change, economic structures may break, conventional policy tools are more effective in some periods than in others, economic agents face constraints that occasionally bind. Perhaps, not surprisingly, conventional one-regime models with constant parameters fail to capture this reality and have difficulties explaining the recent data, irrespective of their micro-foundations and the accuracy with which they are solved. Macroeconomic models with regime switches are promising extensions to the one-regime models and are already proving useful to address all of the above problems.

The course will introduce participants to a range of tools for solving and estimating regime-switching Bayesian Vector Auto-regression (BVAR) models and regime-switching Dynamic Stochastic General Equilibrium (DSGE) models. The topics discussed will include solution methods, stability, identification, estimation, simulation, (unconditional and conditional) forecasting, regime-switching models with both constant and time-varying transition probabilities, and occasionally-binding constraints.

The conceptual and computational problems involved in dealing with regime-switching BVAR and regime-switching DSGE models are massively difficult to solve and massively worth the solving given the pressing economic and policy issues of our times. Fortunately we have in RISE (Rationality In Switching Environments), a user-friendly Matlab-based object-oriented program that implements the solution and estimation algorithms for this class of problems, with the conventional constant-parameter models being a special case.

Naturally then, the course will also introduce participants to the RISE toolbox, which will be used to demonstrate the various applications. Hence, participants interested in practicing RISE and in those applications will need to bring along a laptop with Matlab installed. In addition to the core Matlab, the optimization toolbox and the statistics toolbox of Matlab are also needed for running RISE.