Introduction to Regime-Switching DSGE Modeling using the RISE toolbox

This is a 2-day course to be held at the German Institute for Economic Research (DIW Berlin) on February 19-20, 2018.

1 Intended audience

1. PhD students looking to construct, solve, estimate, analyze (or simply learn more about) regime switching DSGE (RS-DSGE) models.

2 Course description

2.1 Overview

This is an introductory course for individuals with little or no previous knowledge of the practicalities involved in RS-DSGE modeling and/or the RISE toolbox.

The intention of the introductory course is not to train participants to become specialists in the field but instead for them to understand the stakes of regime switching and to get a basic exposure to the main techniques involved in solving and analyzing RS-DSGE models so that they may start using those techniques in their work.

Although no prior knowledge of DSGE modeling is assumed it is a fast-paced course and additional reading is provided to help participants to consolidate material.

2.2 Course objectives

By the end of the course participants should:

- Understand the economic foundations of RS-DSGE models and how they relate to current policy issues
- Be able to write dynamic models in a general form suitable for solution, simulation and estimation in a computer using the RISE toolbox.

- Implement basic solution and simulation techniques to analyze RS-DSGE models, showing how the model economies behave under alternative regimes and how they respond to different shocks.

2.3 Course organization

The course runs over a series of two days. Each day will be a mixture of teaching (mostly in the mornings) and practical exercises (mostly in the afternoons) using MATLAB and RISE to solve and simulate models. Afternoon sessions will also be the time to reflect and consolidate the morning work. The instructor will be available throughout the day.

2.4 Prerequisites

Participants must be familiar with

- basic econometrics
- linear algebra
- basic VAR and DSGE analysis

In addition to those requirements

- basic programming skill in Matlab would be a valuable asset.

2.5 Hands-on applications requirements

Students must have their own laptops with the following programs installed:

- Matlab
  - optimization toolbox
  - statistics toolbox
- RISE toolbox: free
- Oxedit (optional): A free version exists
- Users would also find the following useful for editing tex files
  - MikTex (free)
  - Winedt

3 Syllabus

The following syllabus information is made available prior to the course so that those participants who wish to prepare in advance may do so. The issues involved in the syllabus will be dealt with in the course so there is no need to understand everything. The syllabus mostly serves the purpose of pointing the direction in which the course will go so that participants may know what to expect.

The following books provide a background reading for the course but can be challenging for some and are not required: Dejong and Dave (2007), Canova (2007), Gelman et al. (2004), Geweke (2005), Gali (2008), Costa et al. (2005)

3.1 Prototypical RBC and DSGE models

- Selection of RBC Literature: Kydland and Prescott (1982), Hansen (1985), Rogerson (1988), Cooley (1995), King and Rebelo (2000)
- Canonical New Keynesian Model: Clarida et al. (1999), Woodford (2003), Walsh (2010)

3.2 Solution Methods for DSGE models by perturbations

- Constant-parameter DSGE: Klein (2000), Lubik and Schorfheide (2004)
- Regime switching DSGE: Farmer et al. (2009), Maih (2015), Foerster et al. (2016), Cho (2014, 2016), Gupta et al. (2003)

3.3 Filtering and Estimation of DSGE models with and without regime switching

- Linde (2005), An and Schorfheide (2007a,b)
- Alstadheim et al. (2013), Amisano and Tristani (2011), Liu et al. (2011), Bjørnland et al. (2017), Binning and Maih (2015), Sims et al. (2008),

3.4 Various applications

- Optimal policy: Currie and Levine (1993), Debortoli et al. (2014)
- Leaning against the wind: Gerdrup et al. (2017)

- Zero lower bound and occasionally-binding constraints: Binning and Maih (2016a), Binning and Maih (2016b), Binning and Maih (2017), Otrok et al. (2017)
- Prediction bands: Akram et al. (2016)
- Model misspecification: Waggoner and Zha (2012)
- Posterior simulation: Waggoner et al. (2014)

and references therein.

3.5 Introduction to Bayesian Econometrics

- Koop (2003),Geweke (2005)

4 About the instructor

Junior Maih holds a MSc and a PhD from the University of Oslo, Norway. He is a senior economist and special adviser at Norges Bank as well as adjunct Professor of Economics at the Norwegian Business School. He has previously worked for the Research Department of the IMF in Washington DC. He is a member of the Dynare Team and the developer of another software geared towards solving and analyzing DSGE models subject to regime switches.

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