

1. Occasionally Binding Constraints in DSGE Models

Jonathan Swarbrick¹
Bank of Canada

Bank of Canada – CMFE-Carleton Virtual Series
Advanced Topics in Macroeconomic Modelling

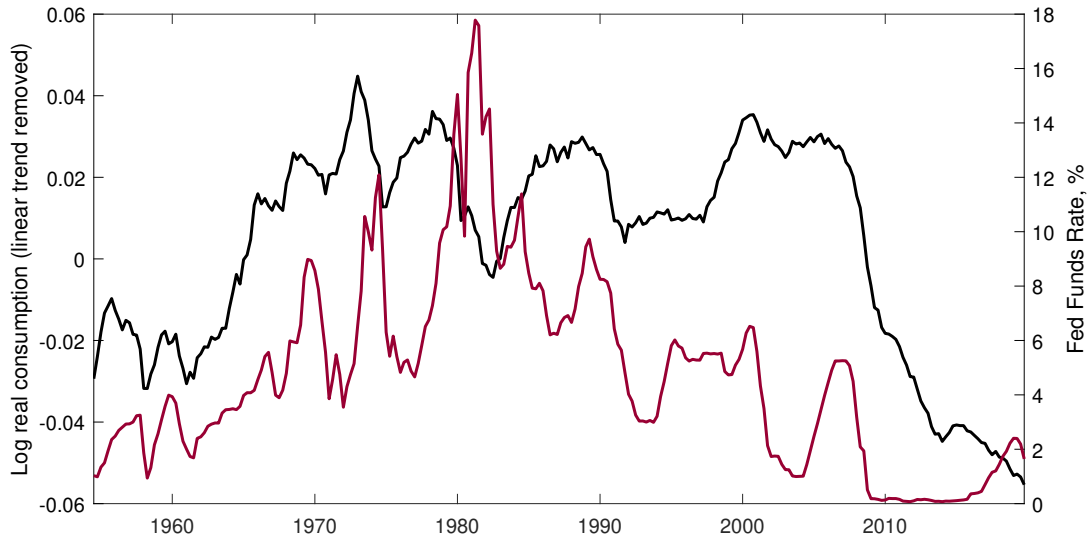
January 2021

¹The views expressed are those of the authors and should not be interpreted as reflecting the views of the Bank of Canada.

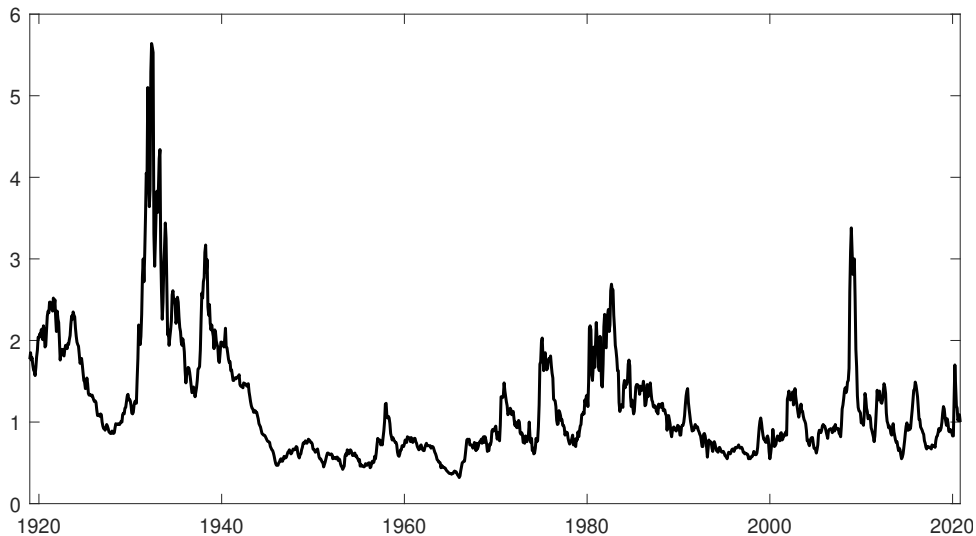
Motivation for the Course

- ▶ Since the financial crisis, many central banks around the world have set their nominal interest rates near zero.
- ▶ Additionally, during the crisis many households, firms and banks were pushed up against their borrowing constraints.
- ▶ The zero lower bound on nominal interest rates and borrowing constraints are prominent examples of occasionally binding constraints (OBCs).
- ▶ OBCs generate significant non-linearities, which means that (log)-linear simulation and estimation methods are likely to perform poorly.

Consumption vs US Fed Funds Rate



Moody's BAA - AAA Corporate Bond Yield Spread



Course Aims

- ▶ This course is designed to give a hands on introduction to the simulation and analysis of models with occasionally binding constraints.
- ▶ We will give brief background on the computational problem and overview solution methods for models with/without OBCs
- ▶ The course will also mention tools for assessing the properties (e.g. existence and uniqueness) of models with occasionally binding constraints.

Course Aims

- ▶ This course is designed to give a hands on introduction to the simulation and analysis of models with occasionally binding constraints.
- ▶ We will give brief background on the computational problem and overview solution methods for models with/without OBCs
- ▶ The course will also mention tools for assessing the properties (e.g. existence and uniqueness) of models with occasionally binding constraints.

Please...

- ▶ Play with code while I'm talking
- ▶ Try things out on your own models
- ▶ Interrupt me when things aren't clear

Rough Outline for the Course

1. First session:

- ▶ Introduction – OBCs in macro models
- ▶ Model approximations and problem of OBCs
- ▶ Global approximation
- ▶ Intro to perturbation

2. Second session:

- ▶ Newton Method (perfect foresight)
- ▶ Intro to local-based methods
- ▶ Penalty function approximation
- ▶ Regime-switching

3. Third session:

- ▶ News shocks
- ▶ Precautionary behaviour
- ▶ Multiple equilibria