

WORKSHOP ON CENTRAL BANK MODELS, SESSION II
CENTRAL BANKER'S MODELING TOOLBOX:
ONE-FOR-ALL OR ALL-FOR-ONE?

JAMES M. NASON
NORTH CAROLINA STATE UNIVERSITY

@ BANK OF CANADA
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WHEN MACROECONOMISTS BUILD MODELS

SUGGESTIONS FOR RESEARCH

FINAL THOUGHTS

COHERENT MODELS-COHERENT POLICY ANALYSIS

- ▶ QUESTION 1: How to manage the trade-off between the internal consistency and complexity of models?

- ▶ Good question, but there's the Folk Theorem "*All models are false.*"
 1. Complexity does not inoculate a model from being readily falsified.
 2. If everything matters or confounds model building and policy analysis, is the evaluation of models or policies possible?

- ▶ Perhaps, recast the question: How to manage the trade-off between
 1. obtaining useful policy analysis from falsifiable models and at the same time
 2. keep the internal model mechanisms clear and coherent
 3. so policymakers can easily communicate policy decisions to the public?

MODELS AND POLICY ANALYSIS

- ▶ QUESTIONS 2 & 4: Can a single model be used to conduct policy analysis, to assess risk in financial markets, and to forecast?
- ▶ Models force economists
 1. to separate assumptions integral for the workings of the model
 2. from the endogenous mechanisms driving model predictions.
- ▶ Suggests matching models to research and policy questions conditional on the tools available to the analyst.
- ▶ Implicit is my view that macro has useful classes of models, but
 1. macro is a long way from having a unified theory,
 2. let alone a single model capable of answering any and all research and policy questions.

MODELS AND POLICY EVALUATION

- ▶ Second part of the Folk Theorem “*It takes a model to beat a model.*”
 1. Suggests bringing several models to the table to evaluate policy.
 2. Bayesian decision theory, minimax and/or minimax regret decision theory offer ways to assess trade-offs inherent in competing models.

- ▶ Using several models to evaluate risk in financial markets is especially important from the perspective of macro.
 1. Ex: Few macro models incorporate risk sharing in financial markets.
 2. Shi (JME, 2015) is an exception \Rightarrow an explicit risk sharing condition between investors and entrepreneurs.

- ▶ If financial market risk sharing collapsed in 2007–2013,
 1. macro models need to include risk sharing arrangements to evaluate policies aimed at mitigating instability in financial markets.
 2. Today, these interventions are labeled macroprudential policy.

MODELS AND THE FORECASTING PROBLEM

- ▶ A Folk Theorem of Forecasting, “A *model with good in-sample fit frequently performs poorly out-of-sample.*”
- ▶ As has been said before, forecasting is difficult.
 1. Producing forecasts without inducing systematic errors is hard.
 2. (Otherwise, as I tell my spouse, everyone would do it.)
- ▶ State of the art solutions of the forecasting problem involves several statistical and/or econometric models
 1. to produce density forecasts and engage in model averaging or
 2. use the model confidence set to find the best models (given the models on the table and the data).
- ▶ Still, given the interest rate path, policymakers want to understand
 1. the role of structural shocks in out-of-sample forecasts, which
 2. is an evaluation of the cross-equation restrictions of a DSGE model.

MODEL PARADIGMS

- ▶ QUESTION 3: What is known today about the central bank model toolbox of the future?

- ▶ Why have DSGE models remained a foundation of macroeconomics?
 1. This class of models is internally consistent,
 2. sufficiently malleable to introduce new features
 3. deemed useful to address many different questions.

A CENTRAL BANK TOOLBOX OF THE FUTURE

- ▶ Policymakers often want to understand the impact of competing policies through the prism of restrictions available in DSGE models.
 1. NK-DSGE models: Lindé, Smets, and Wouters (Riksbank, wp 323, 2016).
 2. Macro-finance models: Bianchi and Bigio (NBER, wp 20490, 2014).
 3. Heterogeneous agent models: Gornemann, Kuester, and Nakajima (FRB-Philadelphia, wp 12-21, 2012).
 4. New Monetarism: Williamson (FRB-St. Louis, wp 2014-026B, 2016).
 5. Density forecasting: Aasveit, Ravazzolo, and van Dijk (JBES, 2016), Smith and Vahey (JBES, 2016); Forecasting using a NK-DSGE model with SV in real time: Diebold, Schorfheide, and Shin (JofE, 2017).

FINIS

THANK YOU.