

# Evaluating DSGE Models for Monetary and Fiscal Policy Analysis

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This dissertation creates and applies a framework for evaluating the suitability of misspecified dynamic stochastic general equilibrium (DSGE) models for particular tasks. The first essay applies the framework to the task of monetary policy analysis; the second lays out the framework more generally; and the third is a structural VAR exercise regarding fiscal multipliers.

### 1 A Forecasting Metric for Evaluating DSGE Models for Policy Analysis *Job Market Paper*

This paper evaluates the suitability of current DSGE models for monetary policy analysis from a Bayesian perspective, recognizing that these models may be useful even if they are misspecified along some dimensions, using the framework laid out in Faust and Gupta (2009). The paper argues that practical monetary policy analysis deals with determining how intended policy should be revised in light of the structural interpretation of incoming news. Standard DSGE models are linear and Gaussian, so this analysis reduces to i) the variance-covariance properties of one-step ahead reduced-form forecast errors and ii) Kalman gains relating those forecast errors to unobserved structural shocks. Standard model evaluation tools assess the degree to which the model matches *all aspects* of the reduced form of the data. The paper provides new tools for evaluating both the forecast error properties and the structural implications. Finally the paper illustrates this approach using the noted Smets-Wouters model (*AER*, 2007), finding strengths and some important shortcomings.

### 2 Bayesian Evaluation of Misspecified DSGE Models (with Jon Faust), *in progress*

This paper starts with the view that existing DSGE models are seriously misspecified in some dimensions and yet may offer valuable insights in others. The problem, then, is to determine the suitability of the model for a particular use. Conventional Bayesian model comparison tools reveal which model best accounts for *all aspects* of the reduced form of the data. When deciding whether to proceed with a misspecified model (in lieu of an alternative), we argue that tools for evaluating strengths and weaknesses for the task at hand would be more appropriate. Geweke's (2010) approach to analyzing *incomplete models* forms our starting point, but when the task at hand requires causal inference regarding general equilibrium questions, treating the model as *incomplete* becomes problematic. Our proposed tools have the Bayesian interpretation that the analyst has difficult-to-codify prior information on both the structural misspecification of the model and the causal interpretation of events in the sample. The tools are constructive and could thereby be seen as a way to elicit and analyze these priors. Therefore, they provide a natural path to model improvement and/or provide information about what model implications should be discounted until that improvement can be achieved. The main mechanical steps are analyzing the task at hand for "reduced form" and "structural" features and then performing the relatively standard prior and posterior predictive analysis.

### 3 Fiscal Policy Multipliers at the Zero Bound: Analysis of Japan's Lost Decade, *in progress*

This paper estimates fiscal policy multipliers at the zero bound for Japan. As recently formalized New Keynesian models have illustrated, fiscal policy shocks may have different effects when the central bank is unable to accommodate deflationary pressures at the zero bound. The paper is an empirical assessment of how the effects of fiscal shocks differ when an economy is stuck at the zero bound. It estimates a structural VAR on Japanese data, following the Blanchard-Perotti (*QJE*, 2002) approach to tax-code-based identification using newly available quarterly Japanese data on income tax, corporation tax, and consumption tax. The paper estimates fiscal policy multipliers for taxes and spending separately for two sample periods—one where the interest rates are not bound at zero (prior to 1995) and one where they are at the zero bound (post 1995).