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### On Identification of Bayesian DSGE Models

by Gary Koop, M. Hashem Pesaran, Ron P. Smith  
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#### Abstract:

In recent years there has been increasing concern about the identification of parameters in dynamic stochastic general equilibrium (DSGE) models. Given the structure of DSGE models it may be difficult to determine whether a parameter is identified. For the researcher using Bayesian methods, a lack of identification may not be evident since the posterior of a parameter of interest may differ from its prior even if the parameter is unidentified. We show that this can be the case even if the priors assumed on the structural parameters are independent. We suggest two Bayesian identification indicators that do not suffer from this difficulty and are relatively easy to compute. The first applies to DSGE models where the parameters can be partitioned into those that are known to be identified and the rest where it is not known whether they are identified. In such cases the marginal posterior of an unidentified parameter will equal the posterior expectation of the prior for that parameter conditional on the identified parameters. The second indicator is more generally applicable and considers the rate at which posterior precision gets updated as the sample size ( $T$ ) is increased. For identified parameters the posterior precision rises at rate  $T$ , whilst for an unidentified parameter its posterior precision may be updated but its rate of update will be slower than  $T$ . This result assumes that the identified parameters are  $\sqrt{T}$ -consistent, but similar differential rates of updates for identified and unidentified parameters can be established in the case of super consistent estimators. These results are illustrated by means of simple DSGE models.

**Text:** See [Discussion Paper No. 5638](#)



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