“Problems in Interpreting Data when Models Have Latent Variables”

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Abstract

There exist many latent variables in macro econometrics that are commonly referred to as "stars". Examples are the NAIRU, potential GDP, and the neutral real rate of interest. They are estimated using the Kalman filter and/or smoother from models that can be expressed in State Space Form. When there are more shocks than observables in the State Space Form representation of such models, issues arise related to the recoverability of these variables from the data. Recoverability is problematic in this setting even if the assumed model for the data is correct and all model parameters are known. In this paper, we examine recoverability in a range of popular models and show that many of these cannot be recovered and popular techniques such as variance decompositions are invalid when explaining the data.