Title

stata.com

estat stable — Check stability of system

Description

`estat stable` displays functions of the model parameters that indicate whether the model is saddle-path stable at specific parameter values. These results can help you find initial values for which the model is saddle-path stable. Saddle-path stability is required for solving and estimating the parameters of DSGE models.

Menu for estat

Statistics > Postestimation

Syntax

```
estat stable
```

`collect` is allowed; see [U] **11.1.10 Prefix commands**.

Remarks and examples

stata.com

DSGE models are dynamic systems that are subject to random shocks. DSGE models that do not spiral out of control or converge to a single point when shocked are said to be "saddle-path stable". We can solve for the state-space form of DSGE models only if they are saddle-path stable, and we can estimate the parameters of models only if we can solve for the state-space form.

The structural parameter values determine whether a DSGE model is saddle-path stable. In the process of solving the structural form for the state-space form, the Klein (2000) solver computes the generalized eigenvalues of a matrix formed from structural parameter values. An eigenvalue is said to be stable when its absolute value is less than 1. The model is saddle-path stable when the number of stable eigenvalues equals the number of states in the model.

`estat stable` displays the generalized eigenvalues implied by the parameter values in `e(b)`, indicates which are stable and which are unstable, and displays a note indicating whether the model is saddle-path stable at these parameter values. `estat stable` can help you find initial values for the maximization routine when the default values imply a model that is not saddle-path stable; see [DSGE] **Intro 5** for details.

Stored results

`estat stable` stores the following in `r()`:

Scalars
- `r(stable)` — `1` if stable, `0` otherwise

Matrices
- `r(eigenvalues)` — eigenvalues

Methods and formulas

`estat stable` displays the generalized eigenvalues computed by the Klein (2000) solver. Values less than 1 are labeled as stable; values greater than or equal to 1 are labeled as unstable.

Reference

Klein, P. 2000. Using the generalized Schur form to solve a multivariate linear rational expectations model. *Journal of Economic Dynamics and Control* 24: 1405–1423. https://doi.org/10.1016/S0165-1889(99)00045-7.

Also see

[DSGE] **dsge** — Linear dynamic stochastic general equilibrium models

[DSGE] **dsge postestimation** — Postestimation tools for dsge

[DSGE] **dsgenl** — Nonlinear dynamic stochastic general equilibrium models

[DSGE] **dsgenl postestimation** — Postestimation tools for dsgenl

[DSGE] **Intro 5** — Stability conditions