Title

lrtest — Likelihood-ratio test of linear hypothesis

Description

lrtest is a postestimation command for use after sem, gsem, and other Stata estimation commands.

lrtest performs a likelihood-ratio test comparing models. See [R] **lrtest**.

Menu

Statistics > SEM (structural equation modeling) > Testing and CIs > Likelihood-ratio test

Syntax

{sem | gsem} ..., ...   (fit model 1)

estimates store *modelname1*

{sem | gsem} ..., ...   (fit model 2)

estimates store *modelname2*

lrtest *modelname1 modelname2*   (compare models)

> where one of the models is constrained and the other is unconstrained. lrtest counts parameters to determine which model is constrained and which is unconstrained, so it does not matter which model is which.

Warning concerning use with sem: Do not omit variables, observed or latent, from the model. Constrain their coefficients to be 0 instead. The models being compared must contain the same set of variables. This is because the standard SEM likelihood value is a function of the variables appearing in the model. Despite this fact, use of lrtest is appropriate under the relaxed conditional normality assumption.

Note concerning gsem: The above warning does not apply to gsem just as it does not apply to other Stata estimation commands. Whether you omit variables or constrain coefficients to 0, results will be the same. The generalized SEM likelihood is conditional on the exogenous variables.

Remarks and examples

See [SEM] **Example 10** and [SEM] **Example 39g**.

When using lrtest after sem, you must be careful that the models being compared have the same observed and latent variables. For instance, the following is allowed:

```
. sem (L1 -> x1 x2 x3) (L1 <- x4 x5) (x1 <- x4) (x2 <- x5)
. estimates store m1
. sem (L1 -> x1 x2 x3) (L1 <- x4 x5)
. estimates store m2
. lrtest m1 m2
```

This is allowed because both models contain the same variables, namely, L1, x1, ..., x5, even though the second model omitted some paths.

The following would produce invalid results:

```
. sem (L1 -> x1 x2 x3) (L1 <- x4 x5) (x1 <- x4) (x2 <- x5)
. estimates store m1
. sem (L1 -> x1 x2 x3) (L1 <- x4)
. estimates store m2
. lrtest m1 m2
```

It produces invalid results because the second model does not include variable x5 and the first model does. To run this test correctly, you type

```
. sem (L1 -> x1 x2 x3) (L1 <- x4 x5) (x1 <- x4) (x2 <- x5)
. estimates store m1
. sem (L1 -> x1 x2 x3) (L1 <- x4 x5@0)
. estimates store m2
. lrtest m1 m2
```

If we were using gsem rather than sem, all the above would still be valid.

Stored results

See *Stored results* in [R] **lrtest**.

Also see

[SEM] **Example 10** — MIMIC model

[SEM] **Example 39g** — Three-level model (multilevel, generalized response)

[R] **lrtest** — Likelihood-ratio test after estimation

[SEM] **test** — Wald test of linear hypotheses

[SEM] **estat stdize** — Test standardized parameters

[SEM] **estat eqtest** — Equation-level tests that all coefficients are zero