

`sample` specifies that the sample variance and covariances be used in variance formulas to compute normalized and standardized residuals. The default uses fitted variance and covariance values as described by [Bollen \(1989\)](#).

`nm1` specifies that the variances be computed using $N - 1$ in the denominator rather than using sample size N .

`zerotolerance(tol)` treats residuals within `tol` of 0 as if they were 0. `tol` must be a numeric value less than 1. The default is `zerotolerance(0)`, meaning that no tolerance is applied.

When standardized residuals cannot be calculated, it is because a variance calculated by the [Hausman \(1978\)](#) theorem turns negative. Applying a tolerance to the residuals turns some residuals into 0 and then division by the negative variance becomes irrelevant, and that may be enough to solve the calculation problem.

`format(%fmt)` specifies the display format. The default is `format(%9.3f)`.

Remarks and examples

[stata.com](http://www.stata.com)

See [\[SEM\] example 10](#).

Stored results

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

Scalars

`r(N_groups)` number of groups

Macros

`r(sample)` empty or `sample`, if `sample` was specified
`r(nm1)` empty or `nm1`, if `nm1` was specified

Matrices

`r(nobs)` sample size for each group
`r(res_mean[_#])` raw mean residuals (for group #) (*)
`r(res_cov[_#])` raw covariance residuals (for group #)
`r(nres_mean[_#])` normalized mean residuals (for group #) (*)
`r(nres_cov[_#])` normalized covariance residuals (for group #)
`r(sres_mean[_#])` standardized mean residuals (for group #) (*)
`r(sres_cov[_#])` standardized covariance residuals (for group #)

(*) If there are no estimated means or intercepts in the `sem` model, these matrices are not returned.

References

- Bollen, K. A. 1989. *Structural Equations with Latent Variables*. New York: Wiley.
- Hausman, J. A. 1978. Specification tests in econometrics. *Econometrica* 46: 1251–1271.
- Jöreskog, K. G., and D. Sörbom. 1986. *Lisrel VI: Analysis of linear structural relationships by the method of maximum likelihood*. Mooresville, IN: Scientific Software.

Also see

[SEM] [example 10](#) — MIMIC model

[SEM] [estat gof](#) — Goodness-of-fit statistics

[SEM] [estat ggof](#) — Group-level goodness-of-fit statistics

[SEM] [estat eqgof](#) — Equation-level goodness-of-fit statistics

[SEM] [methods and formulas for sem](#) — Methods and formulas for sem

[SEM] [sem postestimation](#) — Postestimation tools for sem