**estat vce** — Display covariance matrix estimates



## Description

`estat vce` displays the covariance or correlation matrix of the parameter estimates of the previous model.

## Quick start

Display variance–covariance matrix of the estimates (VCE) from the previous model

```
estat vce
```

Matrix of correlations rather than covariances

```
estat vce, correlation
```

Same as above, but report correlations using three decimal places

```
estat vce, correlation format(%6.3f)
```

After fitting a multiple-equation model, display VCE for each equation in separate blocks

```
estat vce, block
```

Show VCE for equation `y1` only

```
estat vce, equation(y1)
```

## Menu for estat

Statistics > Postestimation

## Syntax

```
estat vce [ , estat_vce_options ]
```

| *estat_vce_options* | Description |
|---|---|
| covariance | display as covariance matrix; the default |
| correlation | display as correlation matrix |
| equation(*spec*) | display only specified equations |
| block | display submatrices by equation |
| diag | display submatrices by equation; diagonal blocks only |
| format(*%fmt*) | display format for covariances and correlations |
| nolines | suppress lines between equations |
| *display_options* | control display of omitted variables and base and empty cells |

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

## Options

covariance displays the matrix as a variance–covariance matrix; this is the default.

correlation displays the matrix as a correlation matrix rather than a variance–covariance matrix. rho is a synonym.

equation(*spec*) selects part of the VCE to be displayed. If *spec* is *eqlist*, the VCE for the listed equations is displayed. If *spec* is *eqlist1* \ *eqlist2*, the part of the VCE associated with the equations in *eqlist1* (rowwise) and *eqlist2* (columnwise) is displayed. If *spec* is *, all equations are displayed. equation() implies block if diag is not specified.

block displays the submatrices pertaining to distinct equations separately.

diag displays the diagonal submatrices pertaining to distinct equations separately.

format(*%fmt*) specifies the number format for displaying the elements of the matrix. The default is format(%10.0g) for covariances and format(%8.4f) for correlations. See **[U] 12.5 Formats: Controlling how data are displayed** for more information.

nolines suppresses lines between equations.

*display_options*: noomitted, noemptycells, baselevels, allbaselevels; see [R] **Estimation options**.

## Remarks and examples

estat vce allows you to display the VCE of the parameters of the previously fit model, as either a covariance matrix or a correlation matrix.

## ▷ Example 1

Returning to the example in [R] **estat ic**, here we display the covariance matrix of the parameters of the `mlogit` model by using `estat vce`.

```
. use https://www.stata-press.com/data/r19/sysdsn1
(Health insurance data)
. mlogit insure age male nonwhite
  (output omitted)
. estat vce, block
Covariance matrix of coefficients of mlogit model
  Covariances of equation Indemnity
                 |          o.          o.          o.          o.
                 |         age        male    nonwhite       _cons
-----------------+----------------------------------------------------
           o.age |           0
          o.male |           0           0
       o.nonwhite|           0           0           0
         o._cons |           0           0           0           0
  Covariances of equation Prepaid (row) by equation Indemnity (column)
                 |          o.          o.          o.          o.
                 |         age        male    nonwhite       _cons
-----------------+----------------------------------------------------
             age |           0
            male |           0           0
       nonwhite  |           0           0           0
           _cons |           0           0           0           0
  Covariances of equation Prepaid
                 |         age        male    nonwhite       _cons
-----------------+----------------------------------------------------
             age |   .00003711
            male |  -.00015303    .0402091
       nonwhite  |  -.00008948   .00470608   .04795135
           _cons |  -.00159095  -.00398961  -.00628886   .08000462
  Covariances of equation Uninsure (row) by equation Indemnity (column)
                 |          o.          o.          o.          o.
                 |         age        male    nonwhite       _cons
-----------------+----------------------------------------------------
             age |           0
            male |           0           0
       nonwhite  |           0           0           0
           _cons |           0           0           0           0
  Covariances of equation Uninsure (row) by equation Prepaid (column)
                 |         age        male    nonwhite       _cons
-----------------+----------------------------------------------------
             age |   .00001753  -.00007926  -.00004564  -.00076886
            male |  -.00007544   .02188398    .0023186  -.00145923
       nonwhite  |  -.00004577   .00250588   .02813553  -.00263872
           _cons |  -.00077045  -.00130535  -.00257593   .03888032
  Covariances of equation Uninsure
                 |         age        male    nonwhite       _cons
-----------------+----------------------------------------------------
             age |   .00013022
            male |  -.00050406   .13248095
       nonwhite  |  -.00026145   .01505449   .16861327
           _cons |  -.00562159  -.01686629  -.02474852   .28607591
```

The block option is particularly useful for multiple-equation estimators. The first block of output here corresponds to the VCE of the estimated parameters for the first equation—the square roots of the diagonal elements of this matrix are equal to the standard errors of the first equation's parameters. Similarly, the final block corresponds to the VCE of the parameters for the second equation. The middle block shows the covariances between the estimated parameters of the first and second equations.

◁

## Stored results

estat vce stores the following in r():

Matrices

| | |
|---|---|
| r(V) | VCE or correlation matrix |

## Also see

[R] **estat** — Postestimation statistics

[R] **estat ic** — Display information criteria

[R] **estat summarize** — Summarize estimation sample