Title

estat greport — Report estimated group IRT parameters

Description | Quick start | Menu | Syntax
Options | Remarks and examples | Stored results | Also see

Description

`estat greport` displays the estimated group IRT parameters.

Quick start

Group 2PL model for binary items `b1` to `b10`

```
irt 2pl b1-b10, group(female)
```

Report results in a compact format

```
estat greport
```

Report standard errors in addition to coefficients

```
estat greport, se
```

Report results grouped by parameter type

```
estat greport, byparm
```

Same as above, and sort items by estimated difficulty

```
estat greport, byparm sort(b)
```

Menu

Statistics > IRT (item response theory)

Syntax

```
estat greport [, options]
```

options	Description
sort(*p*[, descending])	sort items by the estimated *p* parameters; *p* may be a, b, or c
byparm	arrange table rows by parameter rather than by item
Main	
alabel(*string*)	specify the a parameter label; the default is Discrim
blabel(*string*)	specify the b parameter label; the default is Diff
clabel(*string*)	specify the c parameter label; the default is Guess
seqlabel	label parameters in sequential order
post	post estimated IRT parameters and their VCE as estimation results
Reporting	
b[(%*fmt*)]	how to format coefficients, which are always reported
se[(%*fmt*)]	report standard errors and use optional format
t[(%*fmt*)]	report *t* or *z* statistics and use optional format
p[(%*fmt*)]	report *p*-values and use optional format
parmwidth(#)	use # characters to display variable and parameter names
grwidth(#)	use # characters to display group names and statistics
style(oneline)	display vertical line after variable names; the default
style(columns)	display vertical lines separating columns
style(noline)	suppress all vertical lines
grlabel(*string*)	column labels for groups
title(*string*)	title for table

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

Options

sort(*p*[, descending]) requests that items be sorted according to parameter *p*, where *p* is one of a, b, or c.

sort(a) specifies that items be sorted according to the estimated discrimination parameters.

sort(b) specifies that items be sorted according to the estimated difficulty parameters.

sort(c) specifies that items be sorted according to the estimated pseudoguessing parameters. It is relevant only for a 3PL model when option sepguessing is specified.

descending requests that the sorted items be reported in descending order. Sorted items are reported in ascending order by default.

byparm requests that the table rows be grouped by parameter rather than by item.

Main

alabel(*string*) labels the discrimination parameters with *string*. The default label is Discrim.

blabel(*string*) labels the difficulty parameters with *string*. The default label is Diff.

clabel(*string*) labels the pseudoguessing parameters with *string*. The default label is Guess. This option applies only to 3PL models.

`seqlabel` labels the estimated difficulty parameters within each categorical item sequentially, starting from 1. In NRM, `seqlabel` also labels the estimated discrimination parameters within each item sequentially, starting from 1. This option applies only to categorical models.

`post` causes `estat greport` to behave like a Stata estimation (e-class) command. `estat greport` posts the vector of estimated IRT parameters along with the corresponding variance–covariance matrix to `e()`, so that you can treat the estimated IRT parameters just as you would results from any other estimation command. For example, you could use `test` to perform simultaneous tests of hypotheses on the parameters, or you could use `lincom` to create linear combinations.

Reporting

`b(`*%fmt*`)` specifies how the coefficients are to be displayed. You might specify `b(%9.2f)` to make decimal points line up. There is also a `b` option, which specifies that coefficients be displayed, but that is just included for consistency with the `se`, `t`, and `p` options. Coefficients are always displayed.

`se`, `t`, and `p` specify that standard errors, t or z statistics, and p-values be displayed. The default is not to display them. `se(`*%fmt*`)`, `t(`*%fmt*`)`, and `p(`*%fmt*`)` specify that each be displayed and specify the display format to be used.

`parmwidth(`*#*`)` specifies the number of character positions used to display the names of the variables and parameters. The default is `parmwidth(12)`.

`grwidth(`*#*`)` specifies the number of character positions used to display the names of the groups and statistics. The default is `grwidth(12)`.

`style(`*stylespec*`)` specifies the style of the coefficient table.

`style(oneline)` specifies that a vertical line be displayed after the variables but not between the groups. This is the default.

`style(columns)` specifies that vertical lines be displayed after each column.

`style(noline)` specifies that no vertical lines be displayed.

`grlabel(`*string*`)` specifies the labels for the group columns. The default is to use value labels of the group variable or, if the group variable has no value labels, a factor-variable indicator for each level of the group variable.

`title(`*string*`)` specifies the title to appear above the table.

Remarks and examples stata.com

The following discussion is about how to use `estat greport` with `irt` estimation results. If you are new to the IRT features in Stata, we encourage you to read [IRT] **irt** first.

▷ Example 1: Sorting binary items

We illustrate the features of `estat greport` on a group 2PL model we fit in example 1 of [IRT] **irt, group()**. First, we refit the model.

```
. use https://www.stata-press.com/data/r18/masc2
(Data from De Boeck & Wilson (2004))

. irt 2pl q1-q5, group(female)

Fitting fixed-effects model:

Iteration 0:  Log likelihood = -4594.5412
Iteration 1:  Log likelihood = -4590.4516
Iteration 2:  Log likelihood = -4590.4502
Iteration 3:  Log likelihood = -4590.4502

Group: Male

Group: Female

Fitting full model:

Iteration 0:  Log likelihood = -4503.5396  (not concave)
Iteration 1:  Log likelihood = -4479.7967
Iteration 2:  Log likelihood = -4476.3965
Iteration 3:  Log likelihood = -4476.3448
Iteration 4:  Log likelihood = -4476.3447

Two-parameter logistic model                            Number of obs = 1,500
Log likelihood = -4476.3447

Group: Male

------------------------------------------------------------------------------
             | Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
q1           |
     Discrim |   1.187923   .1804778     6.58   0.000     .8341933    1.541653
        Diff |  -.5507796   .0894536    -6.16   0.000    -.7261054   -.3754538
-------------+----------------------------------------------------------------
q2           |
     Discrim |     .90663   .1318739     6.87   0.000     .6481618    1.165098
        Diff |  -.0450698   .0761722    -0.59   0.554    -.1943645     .104225
-------------+----------------------------------------------------------------
q3           |
     Discrim |   .8828704   .1462984     6.03   0.000     .5961307     1.16961
        Diff |  -1.703158   .2385734    -7.14   0.000    -2.170753   -1.235563
-------------+----------------------------------------------------------------
q4           |
     Discrim |   .8196789   .1221824     6.71   0.000     .5802057    1.059152
        Diff |   .3770973   .0993197     3.80   0.000     .1824342    .5717603
-------------+----------------------------------------------------------------
q5           |
     Discrim |   1.439933   .2218141     6.49   0.000     1.005185    1.874681
        Diff |   1.197739   .1437481     8.33   0.000     .9159978     1.47948
-------------+----------------------------------------------------------------
 mean(Theta) |          0  (omitted)
-------------+----------------------------------------------------------------
  var(Theta) |          1  (constrained)
------------------------------------------------------------------------------
```

```
Group: Female

─────────────┬────────────────────────────────────────────────────────────────
             │ Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
─────────────┼────────────────────────────────────────────────────────────────
q1           │
      Discrim│   1.187923   .1804778     6.58   0.000     .8341933    1.541653
         Diff│  -.5507796   .0894536    -6.16   0.000    -.7261054   -.3754538
─────────────┼────────────────────────────────────────────────────────────────
q2           │
      Discrim│     .90663   .1318739     6.87   0.000     .6481618    1.165098
         Diff│  -.0450698   .0761722    -0.59   0.554    -.1943645     .104225
─────────────┼────────────────────────────────────────────────────────────────
q3           │
      Discrim│   .8828704   .1462984     6.03   0.000     .5961307     1.16961
         Diff│  -1.703158   .2385734    -7.14   0.000    -2.170753   -1.235563
─────────────┼────────────────────────────────────────────────────────────────
q4           │
      Discrim│   .8196789   .1221824     6.71   0.000     .5802057    1.059152
         Diff│   .3770973   .0993197     3.80   0.000     .1824342    .5717603
─────────────┼────────────────────────────────────────────────────────────────
q5           │
      Discrim│   1.439933   .2218141     6.49   0.000     1.005185    1.874681
         Diff│   1.197739   .1437481     8.33   0.000     .9159978     1.47948
─────────────┼────────────────────────────────────────────────────────────────
  mean(Theta)│  -.1348222   .0721434    -1.87   0.062    -.2762206    .0065763
─────────────┼────────────────────────────────────────────────────────────────
   var(Theta)│   .6239155   .1239068                      .4227474    .9208111
─────────────┴────────────────────────────────────────────────────────────────
```

Group IRT models always produce a lot of output. The estimated parameters are reported separately for each group, and it is hard to visually compare estimates across groups. `estat greport` makes such comparisons a breeze.

```
. estat greport

─────────────┬──────────────────────────
    Parameter│     Male        Female
─────────────┼──────────────────────────
q1           │
      Discrim│  1.1879233     1.1879233
         Diff│ -.55077963    -.55077963
─────────────┼──────────────────────────
q2           │
      Discrim│  .90662997     .90662997
         Diff│ -.04506976    -.04506976
─────────────┼──────────────────────────
q3           │
      Discrim│  .88287037     .88287037
         Diff│ -1.7031579    -1.7031579
─────────────┼──────────────────────────
q4           │
      Discrim│  .81967885     .81967885
         Diff│  .37709727     .37709727
─────────────┼──────────────────────────
q5           │
      Discrim│  1.4399331     1.4399331
         Diff│  1.1977389     1.1977389
─────────────┼──────────────────────────
  mean(Theta)│          0    -.13482217
   var(Theta)│          1      .6239155
─────────────┴──────────────────────────
```

For models with many items, it is often convenient to arrange the output according to highest or lowest difficulty (b) or discrimination (a). `estat greport` makes sorting in a desired order easy. Below, we specify option `sort(b)` to cause `estat greport` to display the items in ascending order of the estimated difficulty parameter. The sort is performed on the first group.

```
. estat greport, sort(b)

-----------------------------------------
   Parameter |    Male        Female
-------------+---------------------------
q3           |
     Discrim |  .88287037    .88287037
        Diff | -1.7031579   -1.7031579
-------------+---------------------------
q1           |
     Discrim |  1.1879233    1.1879233
        Diff | -.55077963   -.55077963
-------------+---------------------------
q2           |
     Discrim |  .90662997    .90662997
        Diff | -.04506976   -.04506976
-------------+---------------------------
q4           |
     Discrim |  .81967885    .81967885
        Diff |  .37709727    .37709727
-------------+---------------------------
q5           |
     Discrim |  1.4399331    1.4399331
        Diff |  1.1977389    1.1977389
-------------+---------------------------
  mean(Theta)|          0   -.13482217
   var(Theta)|          1     .6239155
-----------------------------------------
```

Finally, we add the `byparm` option to cause `estat greport` to arrange the table rows by parameter type and then by item difficulty.

```
. estat greport, sort(b) byparm

-----------------------------------------
   Parameter |    Male        Female
-------------+---------------------------
Discrim      |
          q3 |  .88287037    .88287037
          q1 |  1.1879233    1.1879233
          q2 |  .90662997    .90662997
          q4 |  .81967885    .81967885
          q5 |  1.4399331    1.4399331
-------------+---------------------------
Diff         |
          q3 | -1.7031579   -1.7031579
          q1 | -.55077963   -.55077963
          q2 | -.04506976   -.04506976
          q4 |  .37709727    .37709727
          q5 |  1.1977389    1.1977389
-------------+---------------------------
  mean(Theta)|          0   -.13482217
   var(Theta)|          1     .6239155
-----------------------------------------
```

◁

Stored results

estat greport stores the following in r():

Macros	
r(names)	labels used for group names
Matrices	
r(b)	vector of estimated IRT parameters
r(b_pclass)	parameter class
r(V)	variance–covariance matrix of the estimated IRT parameters

estat greport with the post option also stores the following in e():

Macros	
e(properties)	b V
Matrices	
e(b)	vector of estimated IRT parameters
e(V)	variance–covariance matrix of the estimated IRT parameters

Also see

[IRT] **irt** — Introduction to IRT models

[IRT] **irt, group()** — IRT models for multiple groups

[IRT] **irt 1pl** — One-parameter logistic model

[IRT] **irt 2pl** — Two-parameter logistic model

[IRT] **irt 3pl** — Three-parameter logistic model

[IRT] **irt grm** — Graded response model

[IRT] **irt hybrid** — Hybrid IRT models

[IRT] **irt nrm** — Nominal response model

[IRT] **irt pcm** — Partial credit model

[IRT] **irt rsm** — Rating scale model

For suggested citations, see the FAQ on citing Stata documentation.