estimates stats — Model-selection statistics

Description

estimates stats reports model-selection statistics, including the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). These measures are appropriate for maximum likelihood models.

If estimates stats is used for a non–likelihood-based model, such as qreg, missing values are reported.

Quick start

Display table of statistics for last estimation command
estimates stats

Display table of statistics for stored estimates m1 and m2
estimates stats m1 m2

Specify \( N = 1,000 \) for calculation of BIC
estimates stats, n(1000)

Menu

Statistics > Postestimation
Syntax

```
estimates stats [namelist] [, n(#) bicdetail]
```

where namelist is a name, a list of names, _all, or *. A name may be ., meaning the current (active) estimates. _all and * mean the same thing.

Options

n(#) specifies the \( N \) to be used in calculating the BIC; see [R] BIC note.

bicdetail produces a table showing the type of \( N \) used in the BIC calculation. Most estimation commands use the number of observations in the estimation sample for the BIC. For some models, however, other types of \( N \), such as the number of cases in choice models, should be used for the BIC. When the default table of estimates stats contains more than one type of \( N \), specifying bicdetail allows you to see the different types of \( N \) used for the BIC.

Remarks and examples

```
. use https://www.stata-press.com/data/r16/auto
    (1978 Automobile Data)
. logistic foreign mpg weight displ
    (output omitted)
. estimates stats

Akaike’s information criterion and Bayesian information criterion

<table>
<thead>
<tr>
<th>Model</th>
<th>N</th>
<th>ll(null)</th>
<th>ll(model)</th>
<th>df</th>
<th>AIC</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>74</td>
<td>-45.03321</td>
<td>-20.59083</td>
<td>4</td>
<td>49.18167</td>
<td>58.39793</td>
</tr>
</tbody>
</table>

Note: BIC uses \( N = \) number of observations. See [R] BIC note.

Regarding the note at the bottom of the table, \( N \) is an ingredient in the calculation of BIC; see [R] BIC note. The note changes if you specify the n() option, which tells estimates stats what \( N \) to use. \( N = \) Obs is the default.

Regarding the table itself, ll(null) is the log likelihood for the constant-only model, ll(model) is the log likelihood for the model, df is the number of degrees of freedom, and AIC and BIC are the Akaike and Bayesian information criteria.

Models with smaller values of an information criterion are considered preferable.

estimates stats can compare estimation results:

```
. use https://www.stata-press.com/data/r16/auto
    (1978 Automobile Data)
. logistic foreign mpg weight displ
    (output omitted)
. estimates store full
. logistic foreign mpg weight
    (output omitted)
. estimates store sub
```
estimates stats full sub

Akaike's information criterion and Bayesian information criterion

<table>
<thead>
<tr>
<th>Model</th>
<th>N</th>
<th>ll(null)</th>
<th>ll(model)</th>
<th>df</th>
<th>AIC</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>full</td>
<td>74</td>
<td>-45.03321</td>
<td>-20.59083</td>
<td>4</td>
<td>49.18167</td>
<td>58.39793</td>
</tr>
<tr>
<td>sub</td>
<td>74</td>
<td>-45.03321</td>
<td>-27.17516</td>
<td>3</td>
<td>60.35031</td>
<td>67.26251</td>
</tr>
</tbody>
</table>

Note: BIC uses N = number of observations. See [R] BIC note.

Stored results

estimates stats stores the following in r():

Matrices
r(S) matrix with 6 columns (N, ll0, ll, df, AIC, and BIC) and rows corresponding to models in table

Methods and formulas

See [R] BIC note.

Also see

[R] estimates — Save and manipulate estimation results