

**Package Name:** Heckman

**Author:** Quantitative Micro Software

**Date:** 2010/03/31

**Add-in Type:** Global

**Default Proc Name:** heckman

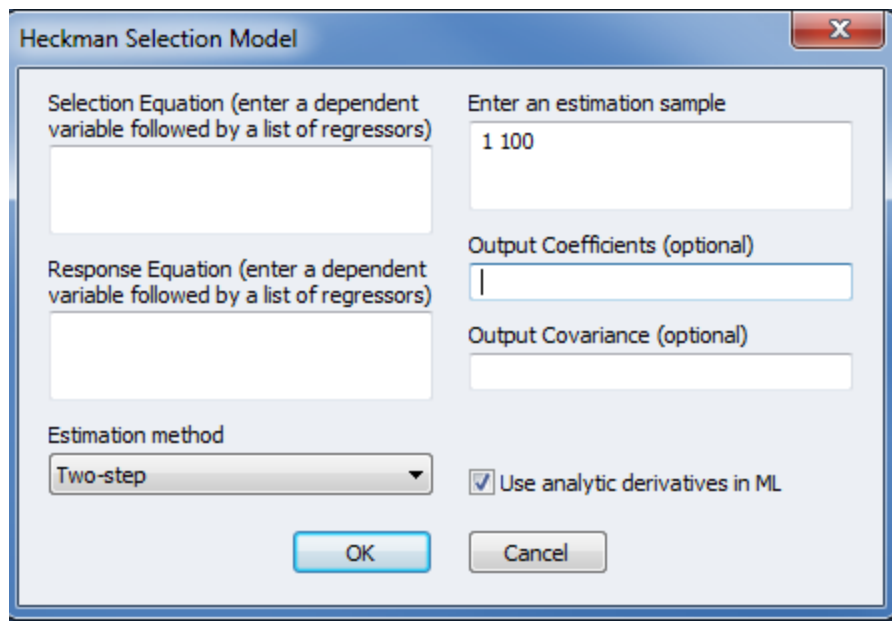
**Default Menu Text:** Heckman Selection Model

**Interface:** Dialog and command line.

**Description:** This add-in performs the Heckman (1976) selection model, using either the two-step estimation technique, or a maximum likelihood procedure. Estimation output for both the selection and the response equations is given, along with some summary statistics.

**Dialog:**

Upon running the add-in from the menus, a dialog will appear asking the user to specify the Heckman selection model:



The screenshot shows a dialog box titled "Heckman Selection Model". It contains several input fields and a checkbox. The "Selection Equation (enter a dependent variable followed by a list of regressors)" field is empty. The "Response Equation (enter a dependent variable followed by a list of regressors)" field is also empty. The "Enter an estimation sample" field contains the text "1 100". The "Output Coefficients (optional)" field is empty. The "Output Covariance (optional)" field is empty. The "Estimation method" dropdown menu is set to "Two-step". The "Use analytic derivatives in ML" checkbox is checked. There are "OK" and "Cancel" buttons at the bottom.

In the first box you should specify the dependent variable for the selection equation, followed by a (space delimited) list of regressors. In the second box you should do the same for the Response Equation. The "Estimation method" combo lets you choose the type of estimation method, from either a Two-step procedure or a Maximum Likelihood procedure. The "Use analytic derivatives in ML" checkbox lets you choose whether to use analytic derivatives or numeric derivatives. Numeric derivatives can be faster, but may not converge as well.

The first box on the right lets you set the sample for the estimation. The final two boxes let you specify the name of a matrix to store the estimated coefficients and the estimated covariance matrix.

Once you hit "OK", a display of the estimation results will appear.

As an example we will use the Mroz87 data from Wooldridge (2003) page 590. To put this data into EViews, run the following commands:

```
wfopen http://fmwww.bc.edu/ec-p/data/wooldridge/MROZ.dta
series kids = kidsge6 + kidslt6
```

Then, specify the Heckman model as follows:

Heckman Selection Model

Selection Equation (enter a dependent variable followed by a list of regressors)  
inlf age age^2 faminc kids educ

Response Equation (enter a dependent variable followed by a list of regressors)  
wage exper exper^2 educ city

Enter an estimation sample  
1 753

Output Coefficients (optional)  
|

Output Covariance (optional)

Estimation method  
Two-step

OK Cancel

The results will look like this:

Spool: RESULTS01 Workfile: MROZ::Mroz\				
View	Proc	Object	Properties	Print
Name	Freeze	100%	Tree+/-	Border
Heckman Selection Model				
Date: 03/31/10 Time: 12:18				
Sample: 1 753				
Included selection observations: 753				
Included response observations: 428				
Selection Equation				
Dependent Variable: INLF				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.725212	1.398255	-2.664187	0.007885
AGE	0.165575	0.064822	2.554311	0.010839
AGE^2	-0.002198	0.000754	-2.916617	0.003646
FAMINC	4.00E-06	4.20E-06	0.951603	0.341609
KIDS	-0.151339	0.038266	-3.954877	8.39E-05
EDUC	0.092240	0.023019	4.007169	6.77E-05
Response Equation				
Dependent Variable: WAGE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.002605	1.937280	-1.033720	0.301605
EXPER	0.026942	0.063499	0.424286	0.671481
EXPER^2	-7.70E-05	0.001910	-0.040314	0.967854
EDUC	0.458746	0.095015	4.828121	1.68E-06
CITY	0.445408	0.316118	1.408992	0.159258
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Inv. Mills Ratio	-0.374986	1.143186	-0.328018	0.742991
Sigma	3.105807			
Rho	-0.120737			

### Command line:

```
heckman(options) selec_spec @ response_spec
```

### Options:

coefmat= <i>name</i>	save the coefficient matrix into a matrix called <i>name</i>
covarnam= <i>name</i>	save the covariance matrix into a matrix called <i>name</i>
ml	use maximum likelihood estimation
d	use analytic derivatives