Title

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eteffects postestimation — Postestimation tools for eteffects

Postestimation commands

The following postestimation command is of special interest after `eteffects`:

Command	Description
`estat endogenous`	perform tests of endogeneity

The following standard postestimation commands are available after `eteffects`:

Command	Description
`estat summarize`	summary statistics for the estimation sample
`estat vce`	variance–covariance matrix of the estimators (VCE)
`estimates`	cataloging estimation results
`hausman`	Hausman's specification test
`lincom`	point estimates, standard errors, testing, and inference for linear combinations of coefficients
`nlcom`	point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients
`predict`	treatment effects, conditional means at treatment, propensity scores, etc.
`predictnl`	point estimates, standard errors, testing, and inference for generalized predictions
`test`	Wald tests of simple and composite linear hypotheses
`testnl`	Wald tests of nonlinear hypotheses

predict

Description for predict

`predict` creates a new variable containing predictions such as treatment effects, conditional means, propensity scores, and linear predictions.

Menu for predict

Statistics > Postestimation

Syntax for predict

```
predict [type] {stub* | newvar | newvarlist} [if] [in] [, statistic tlevel]

predict [type] stub* [if] [in], scores
```

statistic	Description
Main	
`te`	treatment effect; the default
`cmean`	conditional mean at treatment level
`ps`	propensity score
`xb`	linear prediction
`psxb`	linear prediction for propensity score
`xbtotal`	linear prediction, using residuals from treatment model

Specify one new variable with `te`; specify one or two new variables with `cmean`, `ps`, and `xb`.

Options for predict

Main

`te`, the default, calculates the treatment effect.

`cmean` calculates the conditional mean for the control group. To also obtain the conditional mean for the treatment group, specify two variables. If you want the conditional mean for only the treatment group, specify the `tlevel` option.

`ps` calculates the probability of being in the control group. To also obtain the probability of being in the treatment group, specify two variables. If you want the probability of being in the treatment group only, specify the `tlevel` option.

`xb` calculates the linear prediction for the control group. To also obtain the linear prediction for the treatment group, specify two variables. If you want the linear prediction for only the treatment group, specify the `tlevel` option.

`psxb` calculates the linear prediction for the propensity score.

`xbtotal` calculates the linear prediction for the control group, including the residuals from the treatment model as regressors. To also obtain the linear prediction for the treatment group, specify two variables. If you want the linear prediction, including the residuals from the treatment model as regressors, only for the treatment group, specify the `tlevel` option.

`tlevel` specifies that the statistic be calculated for the treatment group; the default is to calculate the statistic for the control group.

`scores` calculates the score variables. For `eteffects`, this is the same as the residuals in the moment conditions used by the generalized method of moments (see [R] **gmm**). For the average treatment effect, the average treatment effect on the treated, and the potential-outcome means, parameter-level scores are computed. For the auxiliary equations, equation-level scores are computed.

estat

Description for estat

`estat endogenous` performs a Wald test to determine whether the estimated correlations between the treatment-assignment and potential-outcome models are different from zero. The null hypothesis is that the correlations are jointly zero. Rejection of the null hypothesis suggests endogeneity.

Menu for estat

Statistics > Postestimation

Syntax for estat

```
estat endogenous
```

`collect` is allowed with `estat endogenous`; see [U] **11.1.10 Prefix commands**.

Remarks and examples

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Example 1: Testing for endogeneity

In example 3 of [TE] **eteffects**, endogeneity could arise if unobservable factors that determine wages are correlated with the decision to live in an urban area. If there is no endogeneity, we would prefer to use one of the `teffects` estimators because they will give us the more efficient standard errors. The control-function approach used by `eteffects` allows us to test for endogeneity.

The control-function approach estimates the correlation between the unobservables of the treatment-assignment and potential-outcome models. If there is no correlation between the unobservables, then there is no endogeneity. We test for correlation, and thus for endogeneity, by typing

```
. use https://www.stata-press.com/data/r17/nlsy80
. eteffects (wage exper iq i.college, exponential nocons)
> (urban i.college fcollege)
  (output omitted)
. estat endogenous
Test of endogeneity
H0: Treatment and outcome unobservables are uncorrelated
           chi2(  2) =  275.36
         Prob > chi2 =    0.0000
```

We reject the null hypothesis of no endogeneity. This suggests that unobservable factors that determine wages mediate the decision to live in an urban area.

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❑ Technical note

The estimated correlations between the unobservables of the treatment-assignment and potential-outcome models are auxiliary parameters. They appear under the headings `TEOM0` and `TEOM1`, which refer to treatment residuals (`TE`) for outcome model 0 (`OM0`) and outcome model 1 (`OM1`), when the option `aequations` is specified.

For the model in example 3 of [TE] **eteffects** with the `aequations` option, the results are the following:

```
. eteffects (wage exper iq i.college, exponential nocons)
> (urban i.college fcollege), aequations
Iteration 0:   EE criterion =  2.903e-25
Iteration 1:   EE criterion =  2.903e-25  (backed up)
Endogenous treatment-effects estimation                   Number of obs = 935
Outcome model: exponential
Treatment model: probit
```

wage	Coefficient	Robust std. err.	z	P>|z|	[95% conf.	interval]
ATE						
urban (1 vs 0)	481.0465	31.74882	15.15	0.000	418.82	543.2731
POmean						
urban 0	233.8083	13.51028	17.31	0.000	207.3286	260.288
TME1						
college 1	.195811	.1012119	1.93	0.053	-.0025607	.3941827
fcollege	.1069748	.0992075	1.08	0.281	-.0874683	.3014179
_cons	.498012	.056408	8.83	0.000	.3874543	.6085698
OME0						
exper	.0193244	.0085633	2.26	0.024	.0025405	.0361082
iq	.0099473	.0036949	2.69	0.007	.0027053	.0171892
college 1	-.3718598	.2678636	-1.39	0.165	-.8968629	.1531433
OME1						
exper	.0238566	.017597	1.36	0.175	-.0106329	.058346
iq	.0148581	.0113311	1.31	0.190	-.0073505	.0370667
college 1	1.236947	.6401383	1.93	0.053	-.0177013	2.491595
TEOM0						
_cons	-7.771932	.6406251	-12.13	0.000	-9.027534	-6.51633
TEOM1						
_cons	16.7739	4.777519	3.51	0.000	7.410131	26.13766

Among other things, we can use these correlations to test the joint significance of the coefficients on the residuals from the treatment-assignment models. This is equivalent to the endogeneity test in example 1. We type

```
. test [TEOM0]_cons [TEOM1]_cons
 ( 1)  [TEOM0]_cons = 0
 ( 2)  [TEOM1]_cons = 0
           chi2(  2) =  275.36
         Prob > chi2 =    0.0000
```

❑

Also see

[TE] **eteffects** — Endogenous treatment-effects estimation

[U] 20 Estimation and postestimation commands