Title

aprub — Estimate the upper bound on the average persuasion rate

Syntax

aprub *depvar treatrvar instrvar* [*covariates*] [*if*] [*in*] [, **model**(*string*) **title**(*string*)]

Options

option	*Description*
model(*string*)	Regression model when *covariates* are present
title(*string*)	Title

Description

aprub estimates the upper bound on the average persuasion rate (APR). *varlist* should include *depvar treatrvar instrvar covariates* in order. Here, *depvar* is binary outcomes (*y*), *treatrvar* is binary treatment (*t*), *instrvar* is binary instruments (*z*), and *covariates* (*x*) are optional.

There are two cases: (i) *covariates* are absent and (ii) *covariates* are present.

- Without *x*, the upper bound (**theta_U**) on the APR is defined by

theta_U = {E[*A*|*z*=1] - E[*B*|*z*=0]}/{1 - E[*B*|*z*=0]},

where *A* = 1(*y*=1,*t*=1)+1-1(*t*=1) and *B* = 1(*y*=1,*t*=0).

The estimate and its standard error are obtained by the following procedure:

1. E[*A*|*z*=1] is estimated by regressing *A* on *z*.
2. E[*B*|*z*=0] is estimated by regressing *B* on *z*.
3. **theta_U** is computed using the estimates obtained above.
4. The standard error is computed via STATA command **nlcom**.

- With x, the upper bound (**theta_U**) on the APR is defined by

    theta_U = E[**theta_U**(x)],

where

    theta_U(x) = {E[$A|z$=1,x] - E[$B|z$=0,x]}/{1 - E[$B|z$=0,x]}.

The estimate is obtained by the following procedure.

If **model**("no_interaction") is selected (default choice),

1. E[$A|z$=1,x] is estimated by regressing A on z and x.
2. E[$B|z$=0,x] is estimated by regressing B on z and x.

Alternatively, if **model**("interaction") is selected,

1. E[$A|z$=1,x] is estimated by regressing A on x given z = 1.
2. E[$B|z$=0,x] is estimated by regressing B on x given z = 0.

Ater step 1, both options are followed by:

3. For each x in the estimation sample, **theta_U**(x) is evaluated.
4. The estimates of **theta_U**(x) are averaged to estimate **theta_U**.

When *covariates* are present, the standard error is missing because an analytic formula for the standard error is complex. Bootstrap inference is implemented when this package's command **persuasio** is called to conduct inference.

Options

model(*string*) specifies a regression model.

This option is only relevant when x is present. The dependent variable is either A or B. The default option is "no_interaction" between z and x. When "interaction" is selected, full interactions between z and x are allowed.

title(*string*) specifies a title.

Remarks

It is recommended to use this package's command **persuasio** instead of calling **aprub** directly.

Examples

We first call the dataset included in the package.

```
. use GKB, clear
```

The first example estimates the upper bound on the APR without covariates.

```
. aprub voteddem_all readsome post
```

The second example adds a covariate.

```
. aprub voteddem_all readsome post MZwave2
```

The third example estimates the upper bound by the covariate.

```
    . by MZwave2,sort: aprub voteddem_all readsome post
```

Stored results

Scalars

e(N): sample size

e(ub_coef): estimate of the upper bound on the average persuasion rate

e(ub_se): standard error of the upper bound on the average persuasion rate

Macros

e(outcome): variable name of the binary outcome variable

e(treatment): variable name of the binary treatment variable

e(instrument): variable name of the binary instrumental variable

e(covariates): variable name(s) of the covariates if they exist

e(model): regression model specification ("no_interaction" or "interaction")

Functions:

e(sample): 1 if the observations are used for estimation, and 0 otherwise.

Authors

Sung Jae Jun, Penn State University, <sjun@psu.edu>

Sokbae Lee, Columbia University, <sl3841@columbia.edu>

License

References

Sung Jae Jun and Sokbae Lee (2019), Identifying the Effect of Persuasion, arXiv:1812.02276 [econ.EM]

Version

0.1.0 30 January 2021