version 0.1.0

Title
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lpr4ytz ── Estimates the local persuasion rate

Syntax
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lpr4ytz *depvar treatrvar instrvar* [*covariates*] [*if*] [*in*] [,
model(*string*) **title**(*string*)]

Options

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

Description
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lpr4ytz estimates the local persuasion rate (LPR). *varlist* should
include *depvar treatrvar instrvar covariates* in order. Here, *depvar* is
binary outcome (*y*), *treatrvar* is binary treatment (*t*), *instrvar* is
binary instrument (*z*), and *covariates* (*x*) are optional.

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

- If *x* are absent, the LPR is defined by

   LPR = {Pr(y=1|z=1)−Pr(y=1|z=0)}/{Pr[y=0,t=0|z=0]−Pr[y=0,t=0|z=1]}.

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

1. The numerator of the LPR is estimated by regressing *y* on *z*.
2. The denominator is estimated by regressing $(1-y)*(1-t)$ on *z*.
3. The LPR is obtained as the ratio.
4. The standard error is computed via STATA command **nlcom.**

- If x are present, the LPR is defined by

$$\text{LPR} = E[\text{LPR}(x)\{e(1|x) - e(0|x)\}]/E[e(1|x) - e(0|x)]$$

where

$\text{LPR}(x) = \{\Pr(y=1|z=1,x) - \Pr(y=1|z=0,x)\}/\{\Pr[y=0,t=0|z=0,x] - \Pr[y=0,t=0|z=1,x]\}$,

$e(1|x) = \Pr(t=1|z=1,x)$, and $e(0|x) = \Pr(t=1|z=0,x)$.

The estimate is obtained by the following procedure.

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

1. The numerator of the LPR is estimated by regressing y on z and x.
2. The denominator is estimated by regressing $(1-y)*(1-t)$ on z and x.
3. The LPR is obtained as the ratio.
4. The standard error is computed via STATA command **nlcom**.

Note that in this case, **LPR**(x) does not depend on x, because of the linear regression model specification.

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

1. $\Pr(y=1|z,x)$ is estimated by regressing y on x given $z = 0,1$.

2. $\Pr[y=0,t=0|z,x]$ is estimated by regressing $(1-y)*(1-t)$ on x given $z = 0,1$.

3. $\Pr(t=1|z,x)$ is estimated by regressing t on x given $z = 0,1$.

4. For each x in the estimation sample, both **LPR**(x) and $\{e(1|x)-e(0|x)\}$ are evaluated.

5. Then, the sample analog of **LPR** is constructed.

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
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model(*string*) specifies a regression model.

This option is only releveant when *x* is present. 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 the title of estimation.

Remarks

It is recommended to use this package's command **persuasio** instead of calling **lpr4ytz** 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.

. lpr4ytz voteddem_all readsome post

The second example adds a covariate.

. lpr4ytz voteddem_all readsome post MZwave2

The third example allows for interactions between *x* and *z*.

. lpr4ytz voteddem_all readsome post MZwave2, model("interaction")

Stored results

Scalars

e(N): sample size

e(lpr_coef): estimate of the local persuasion rate

e(lpr_se): standard error of the estimate of the local 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.

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References

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