Title

lpr4ytz — Estimate the local persuasion rate

Syntax

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

Description

lpr4ytz estimates the local persuasion rate (LPR). *varlist* should include *depvar treatrvar instrvar covariates* in order. Here, *depvar* is binary outcomes (*y*), *treatrvar* is binary treatments (*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 LPR is defined by

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

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**.

- With *x*, the LPR is defined by

LPR = E[**LPR_num**(x]/E[**LPR_den**(x]

where

LPR_num(x) = Pr(y=1|z=1,x) - Pr(y=1|z=0,x)

and

LPR_den(x) = Pr[y=0,t=0|z=0,x] - Pr[y=0,t=0|z=1,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_num**(x) and **LPR_den**(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

model(*string*) specifies a regression model.

This option is only relevant 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 a title.

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_persuasio, clear
```

The first example estimates the LPR 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 (2022), Identifying the Effect of Persuasion, arXiv:1812.02276 [econ.EM]

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