

Package ‘hettreatreg’

May 13, 2020

Type Package

Title Heterogeneous Treatment Effects in Regression Analysis

Version 0.1.0

Description Computes diagnostics for linear regression when treatment effects are heterogeneous.

The output of 'hettreatreg' represents ordinary least squares (OLS) estimates of the effect of a binary treatment as a weighted average of the average treatment effect on the treated (ATT) and the average treatment effect on the untreated (ATU).

The program estimates the OLS weights on these parameters, computes the associated model diagnostics, and reports the implicit OLS estimate of the average treatment effect (ATE).

See Sloczynski (2019), <http://people.brandeis.edu/~tslocz/Sloczynski_paper_regression.pdf>.

URL <https://github.com/tslocz/hettreatreg>

Depends R (>= 3.1)

Imports stats

License GPL-2

Encoding UTF-8

LazyData TRUE

RoxygenNote 7.1.0

NeedsCompilation no

Author Tymon Sloczynski [aut],
Mark McAvoy [cre]

Maintainer Mark McAvoy <mcavoy@brandeis.edu>

Repository CRAN

Date/Publication 2020-05-13 14:50:10 UTC

R topics documented:

hettreatreg	2
nswcps	4

Index	5
--------------	----------

hettreatreg

*OLS Weights on Heterogeneous Treatment Effects***Description**

Computes diagnostics for linear regression when treatment effects are heterogeneous.

Usage

```
hettreatreg(outcome, treatment, covariates, verbose = FALSE)
```

Arguments

outcome	the outcome variable.
treatment	the treatment variable. The variable must be binary and coded 0 for the untreated units and 1 for the treated units.
covariates	the list of control variables. The list must not include the treatment variable.
verbose	logical. If TRUE estimation output is displayed.

Details

hettreatreg represents ordinary least squares (OLS) estimates of the effect of a binary treatment as a weighted average of the average treatment effect on the treated (ATT) and the average treatment effect on the untreated (ATU). The program estimates the OLS weights on these parameters, computes the associated model diagnostics, and reports the implicit OLS estimate of the average treatment effect (ATE). See Sloczynski (2019) for the underlying theoretical results and further details.

The arguments `outcome` and `treatment` are used to designate an outcome variable and a treatment variable, respectively. The treatment variable must be binary and coded 0 for the untreated units and 1 for the treated units. `covariates` is a list of control variables that must not include the treatment variable.

hettreatreg displays a number of statistics. `OLS` is the estimated regression coefficient on the treatment variable. $P(d=1)$ and $P(d=0)$ are the sample proportions of treated and untreated units, respectively. `w1` and `w0` are the OLS weights on ATT and ATU, respectively. `delta` is a diagnostic for interpreting OLS as ATE. ATE, ATT, and ATU are the implicit OLS estimates of the corresponding parameters. See Sloczynski (2019) for further details.

If you use this program in your work, please cite Sloczynski (2019).

Value

OLS	OLS estimate of the treatment effect
$P(d=1)$	proportion of treated units
$P(d=0)$	proportion of untreated units
w1	OLS weight on ATT

w0	OLS weight on ATU
delta	diagnostic for interpreting OLS as ATE
ATE	implicit OLS estimate of ATE
ATT	implicit OLS estimate of ATT
ATU	implicit OLS estimate of ATU

Author(s)

Tymon Sloczynski, Brandeis University, <tslocz@brandeis.edu>, <http://people.brandeis.edu/~tslocz/>

Maintained by: Mark McAvoy, Brandeis University, <mavoy@brandeis.edu>

Please feel free to report bugs and share your comments on this program.

References

Sloczynski, Tymon (2019). "Interpreting OLS Estimands When Treatment Effects Are Heterogeneous: Smaller Groups Get Larger Weights." Available at http://people.brandeis.edu/~tslocz/Sloczynski_paper_regression.pdf.

Examples

```
# load package
library(hettreatreg)

# read in data
data("nswcps")

# save the outcome variable
outcome <- nswcps$re78

# save the treatment variable
treated <- nswcps$treated

# select control variables
our_vars <- c("age", "age2", "educ", "black", "hispanic", "married", "nodegree")
covariates <- subset(nswcps, select = our_vars)

# run function
results <- hettreatreg(outcome, treated, covariates)
print(results)
```

nswcps

*National Supported Work – Current Population Survey (NSW–CPS)***Description**

The data set combines a subsample of the experimental treated units from NSW, constructed by Dehejia and Wahba (1999), with "CPS-1," a nonexperimental comparison group from CPS, constructed by LaLonde (1986).

Usage

nswcps

Format

An object of class `data.frame` with 16177 rows and 11 columns.

Value

A data frame with 11 variables:

treated	1 if treated, 0 otherwise
age	age
age2	age squared
educ	years of schooling
black	1 if black, 0 otherwise
hispanic	1 if Hispanic, 0 otherwise
married	1 if married, 0 otherwise
nodegree	1 if high school dropout, 0 otherwise
re74	real earnings in 1974
re75	real earnings in 1975
re78	real earnings in 1978

References

Dehejia, R. H. and Wahba, S. (1999). "Causal Effects in Nonexperimental Studies: Reevaluating the Evaluation of Training Programs," *Journal of the American Statistical Association*, 94:1053–1062.

LaLonde, R. J. (1986). "Evaluating the Econometric Evaluations of Training Programs with Experimental Data," *American Economic Review*, 76:604–620.

Index

*Topic **datasets**

nswcps, 4

hettreatreg, 2

nswcps, 4