Package ‘causalsens’  
June 18, 2018

Version 0.1.2
Date 2018-06-18
Title Selection Bias Approach to Sensitivity Analysis for Causal Effects
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Imports stats, graphics, grDevices
Depends R (>= 3.0.0)
Description The causalsens package provides functions to perform sensitivity analyses and to study how various assumptions about selection bias affects estimates of causal effects.
License GPL (>= 2)
URL http://www.mattblackwell.org/software/causalsens/
VignetteBuilder knitr
Suggests knitr
Collate ‘causalsens.R’
NeedsCompilation no
Repository CRAN
Date/Publication 2018-06-18 20:06:37 UTC

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Causalsens

Calculate sensitivity of causal estimates to unmeasured confounding.

Description

This function performs a sensitivity analysis of causal effects different assumptions about unmeasured confounding, as described by Blackwell (2013).

Usage

```r
causalsens(model.y, model.t, cov.form, confound = one.sided, data, alpha)
```

Arguments

- `model.y` outcome model object. Currently only handles `lm` objects.
- `model.t` propensity score model. Currently assumes a `glm` object.
- `cov.form` one-sided formula to describe any covariates to be included in the partial R^2 calculations.
- `confound` function that calculates the confounding function. This function must take arguments `alpha`, `pscores`, and `treat`. Defaults to `one.sided`. Other functions included with the package are `one.sided.att`, `alignment`, and `alignment.att`.
- `data` data frame to find the covariates from `cov.form`.
- `alpha` vector of confounding values to pass the confounding function. Defaults to 11 points from -0.5 to 0.5 for binary outcome variable, and 11 points covering the inter-quartile range for non-binary outcome variables.

Value

Returns an object of class `causalsens`.

- `sens` data frame containing alpha values, partial R^2s, estimates, and 95%
- `partial.r2` vector of partial R^2 values for the covariates to compare to sensitivity analysis results.

Lalonde.exp

Experimental data from the job training program first studied by Lalonde (1986)

Description

A dataset of units in an experimental evaluation of a job training program. Subset to those units with two years of pre-treatment income data.
Format
A data frame with 445 rows and 12 variables

Details
• age - age in years.
• education - number of years of schooling.
• black - 1 if black, 0 otherwise.
• hispanic - 1 if Hispanic, 0 otherwise.
• married - 1 if married, 0 otherwise.
• nodegree - 1 if no high school degree, 0 otherwise.
• re74 - earnings ($) in 1974.
• re75 - earnings ($) in 1975.
• re78 - earnings ($) in 1978.
• u74 - 1 if unemployed in 1974, 0 otherwise.
• u75 - 1 if unemployed in 1975, 0 otherwise.
• treat - 1 if treated, 0 otherwise.

References

lalonde.psid Non-experimental data from Lalonde (1986)

Description
A dataset of experimental treated units and non-experimental control units from the Panel Study of Income Dynamics (PSID).

Format
A data frame with 2675 rows and 12 variables

Details
• age - age in years.
• education - number of years of schooling.
• black - 1 if black, 0 otherwise.
• hispanic - 1 if Hispanic, 0 otherwise.
• married - 1 if married, 0 otherwise.
• nodegree - 1 if no high school degree, 0 otherwise.
• re74 - earnings ($) in 1974.
• re75 - earnings ($) in 1975.
• re78 - earnings ($) in 1978.
• u74 - 1 if unemployed in 1974, 0 otherwise.
• u75 - 1 if unemployed in 1975, 0 otherwise.
• treat - 1 if treated, 0 otherwise.

References


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one.sided

Confounding functions

Description

Various confounding functions for use with causalsens.

Usage

one.sided(alpha, pscores, treat)
alignment(alpha, pscores, treat)

one.sided.att(alpha, pscores, treat)
alignment.att(alpha, pscores, treat)

Arguments

alpha vector of confounding values to use in the sensitivity analysis.
pscores vector of propensity scores for each unit.
treat vector of treatment values for each unit.
Plot a causal sensitivity analysis.

Description

Plot the results of a sensitivity analysis against unmeasured confounding as performed by `causalsens`.

Usage

```r
# S3 method for class 'causalsens'
plot(x, type = "r.squared", ...)
```

Arguments

- `x`  
  causalsens object.
- `type`  
  a string taking either the value "r.squared" (default), which plots the estimated effects as a function of the partial R-squared values, or "raw", which plots them as a function of the raw confounding values, `alpha`.
- `...`  
  other parameters to pass to the plot.
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