Package 'rdmulti'

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Type Package

Title Robust Local Polynomial Methods for RD Designs with Multiple Cutoffs or Multiple Scores

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Description The 'rdmulti' package implements estimation, inference, and graphical procedures for regression discontinuity (RD) designs with multiple cutoffs or multiple scores. rdmc() provides point estimation and robust bias-corrected inference for multi-cutoff designs, rdmcplot() provides data-driven RD plots for multi-cutoff designs, and rdms() provides point estimation and robust bias-corrected inference for multi-score designs. See Cattaneo, Titiunik and Vazquez-Bare (2020) <https://rdpackages.github.io/references/Cattaneo-Titiunik-VazquezBare_2020_Stata.pdf> for further methodological details.

Imports ggplot2, rdrobust, rlang

License GPL-3

Encoding UTF-8

URL https://github.com/rdpackages/rdmulti

BugReports https://github.com/rdpackages/rdmulti/issues

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Author Matias D. Cattaneo [aut, cre],
Rocio Titiunik [aut],
Gonzalo Vazquez-Bare [aut]

Maintainer Matias D. Cattaneo <matias.d.cattaneo@gmail.com>

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Contents

`rdmulti-package` *Robust Local Polynomial Methods for RD designs with Multiple Cutoffs or Multiple Scores*

Description

The package `rdmulti` implements estimation, inference, and graphical procedures for Regression Discontinuity (RD) designs with multiple cutoffs or multiple scores. `rdmc()` provides point estimation and robust bias-corrected inference for multi-cutoff designs, `rdmcplot()` provides data-driven RD plots for multi-cutoff designs, and `rdms()` provides point estimation and robust bias-corrected inference for multi-score designs. For more details, and related `Stata` and `R` packages useful for analysis of RD designs, visit `https://rdpackages.github.io/`.

Author(s)

Matias D. Cattaneo, Princeton University. <matias.d.cattaneo@gmail.com>

Rocio Titiunik, Princeton University. <rocio.titiunik@gmail.com>

Gonzalo Vazquez-Bare, UC Santa Barbara. <gvazquezbare@gmail.com>

References

Calonico, S., M.D. Cattaneo, M. Farrell and R. Titiunik. (2017). `rdrobust`: Software for Regression Discontinuity Designs. *Stata Journal* 17(2): 372-404.

Calonico, S., M.D. Cattaneo, and R. Titiunik. (2014). Robust Data-Driven Inference in the Regression-Discontinuity Design. *Stata Journal* 14(4): 909-946.

Calonico, S., M.D. Cattaneo, and R. Titiunik. (2015). `rdrobust`: An R Package for Robust Nonparametric Inference in Regression-Discontinuity Designs. *R Journal* 7(1): 38-51.

Cattaneo, M.D., L. Keele, R. Titiunik and G. Vazquez-Bare. (2016). Interpreting Regression Discontinuity Designs with Multiple Cutoffs. *Journal of Politics* 78(4): 1229-1248.

Cattaneo, M.D., L. Keele, R. Titiunik and G. Vazquez-Bare. (2020). Extrapolating Treatment Effects in Multi-Cutoff Regression Discontinuity Designs. *Journal of the American Statistical Association* 116(536): 1941, 1952.

Cattaneo, M.D., R. Titiunik and G. Vazquez-Bare. (2020). Analysis of Regression Discontinuity Designs with Multiple Cutoffs or Multiple Scores. *Stata Journal* 20(4): 866-891.

Keele, L. and R. Titiunik. (2015). Geographic Boundaries as Regression Discontinuities. *Political Analysis* 23(1): 127-155

See Also

Useful links:

- `https://github.com/rdpackages/rdmulti`
- Report bugs at `https://github.com/rdpackages/rdmulti/issues`

rdmc *Point estimation and robust bias-corrected inference for multi-cutoff designs*

Description

`rdmc()` implements point estimation and robust bias-corrected inference for Regression Discontinuity (RD) designs with multiple cutoffs.

Usage

```
rdmc(
  Y,
  X,
  C,
  fuzzy = NULL,
  derivvec = NULL,
  pooled_opt = NULL,
  verbose = FALSE,
  pvec = NULL,
  qvec = NULL,
  hmat = NULL,
  bmat = NULL,
  rhovec = NULL,
  covs_mat = NULL,
  covs_list = NULL,
  covs_dropvec = NULL,
  kernelvec = NULL,
  weightsvec = NULL,
  bwselectvec = NULL,
  scaleparvec = NULL,
  scaleregulvec = NULL,
  masspointsvec = NULL,
  bwcheckvec = NULL,
  bwrestrictvec = NULL,
  stdvarsvec = NULL,
  vcevec = NULL,
  nnmatchvec = NULL,
  cluster = NULL,
  ginv.tolvec = NULL,
  sharpbwvec = NULL,
  level = 95,
  plot = FALSE,
  conventional = FALSE,
  subset = NULL,
  data = NULL
)
```

Arguments

Y	outcome variable.
X	running variable.
C	cutoff variable.
fuzzy	specifies a fuzzy design. See rdrobust() for details.
derivvec	vector of cutoff-specific order of derivatives. See rdrobust() for details.
pooled_opt	options to be passed to rdrobust() to calculate pooled estimand.
verbose	displays the output from rdrobust for estimating the pooled estimand.
pvec	vector of cutoff-specific polynomial orders. See rdrobust() for details.
qvec	vector of cutoff-specific polynomial orders for bias estimation. See rdrobust() for details.
hmat	matrix of cutoff-specific bandwidths. See rdrobust() for details.
bmat	matrix of cutoff-specific bandwidths for bias estimation. See rdrobust() for details.
rhovec	vector of cutoff-specific values of rho. See rdrobust() for details.
covs_mat	matrix of covariates. See rdrobust() for details.
covs_list	list of covariates to be used in each cutoff.
covs_dropvec	vector indicating whether collinear covariates should be dropped at each cutoff. See rdrobust() for details.
kernelvec	vector of cutoff-specific kernels. See rdrobust() for details.
weightsvec	vector of length equal to the number of cutoffs indicating the names of the variables to be used as weights in each cutoff. See rdrobust() for details.
bwselectvec	vector of cutoff-specific bandwidth selection methods. See rdrobust() for details.
scaleparvec	vector of cutoff-specific scale parameters. See rdrobust() for details.
scaleregulvec	vector of cutoff-specific scale regularization parameters. See rdrobust() for details.
masspointsvec	vector indicating how to handle repeated values at each cutoff. See rdrobust() for details.
bwcheckvec	vector indicating the value of bwcheck at each cutoff. See rdrobust() for details.
bwrestrictvec	vector indicating whether computed bandwidths are restricted to the range or runvar at each cutoff. See rdrobust() for details.
stdvarsvec	vector indicating whether variables are standardized at each cutoff. See rdrobust() for details.
vcevec	vector of cutoff-specific variance-covariance estimation methods. See rdrobust() for details.
nnmatchvec	vector of cutoff-specific nearest neighbors for variance estimation. See rdrobust() for details.
cluster	cluster ID variable. See rdrobust() for details.

ginv.tolvec	vector of cutoff-specific tolerances for generalized inverse calculations. See rdrobust() for details.
sharpbwvec	vector indicating whether fuzzy RD bandwidth selection uses the sharp RD model at each cutoff. See rdrobust() for details.
level	confidence level for confidence intervals. See rdrobust() for details.
plot	plots cutoff-specific estimates and weights.
conventional	reports conventional, instead of robust-bias corrected, p-values and confidence intervals.
subset	optional subset of observations to use.
data	optional data frame for resolving string variable names.

Value

tau	pooled estimate
se.rb	robust bias corrected standard error for pooled estimate
pv.rb	robust bias corrected p-value for pooled estimate
ci.rb.l	left limit of robust bias corrected CI for pooled estimate
ci.rb.r	right limit of robust bias corrected CI for pooled estimate
hl	bandwidth to the left of the cutoff for pooled estimate
hr	bandwidth to the right of the cutofffor pooled estimate
Nhl	sample size within bandwidth to the left of the cutoff for pooled estimate
Nhr	sample size within bandwidth to the right of the cutoff for pooled estimate
B	vector of bias-corrected estimates
V	vector of robust variances of the estimates
Coefs	vector of conventional estimates
W	vector of weights for each cutoff-specific estimate
Nh	vector of sample sizes within bandwidth
CI	robust bias-corrected confidence intervals
H	matrix of bandwidths
Pv	vector of robust p-values
rdrobust.results	results from rdrobust for pooled estimate
cfail	Cutoffs where rdrobust() encountered problems

Author(s)

Matias D. Cattaneo, Princeton University. <matias.d.cattaneo@gmail.com>

Rocio Titiunik, Princeton University. <rocio.titiunik@gmail.com>

Gonzalo Vazquez-Bare, UC Santa Barbara. <gvazquezbare@gmail.com>

References

Cattaneo, M.D., R. Titiunik and G. Vazquez-Bare. (2020). Analysis of Regression Discontinuity Designs with Multiple Cutoffs or Multiple Scores. *Stata Journal*, forthcoming.

Examples

```
# Toy dataset
X <- runif(1000,0,100)
C <- c(rep(33,500),rep(66,500))
Y <- (1 + X + (X>=C))*(C==33)+(.5 + .5*X + .8*(X>=C))*(C==66) + rnorm(1000)
# rdmc with standard syntax
tmp <- rdmc(Y,X,C)
```

`rdmcplot` *Data-driven RD plots for multi-cutoff designs*

Description

`rdmcplot()` implements data-driven Regression Discontinuity (RD) plots for designs with multiple cutoffs.

Usage

```
rdmcplot(
  Y,
  X,
  C,
  nbinsmat = NULL,
  binselectvec = NULL,
  scalevec = NULL,
  supportmat = NULL,
  pvec = NULL,
  hmat = NULL,
  kernelvec = NULL,
  weightsvec = NULL,
  covs_mat = NULL,
  covs_list = NULL,
  covs_evalvec = NULL,
  covs_dropvec = NULL,
  ginv.tolvec = NULL,
  masspointsvec = NULL,
  ci = NULL,
  shade = FALSE,
  col_bins = NULL,
  pch_bins = NULL,
```

```
  col_poly = NULL,
  lty_poly = NULL,
  col_xline = NULL,
  lty_xline = NULL,
  nobins = FALSE,
  nopoly = FALSE,
  noxline = FALSE,
  nodraw = FALSE,
  subset = NULL,
  data = NULL
)
```

Arguments

Y	outcome variable.
X	running variable.
C	cutoff variable.
nbinsmat	matrix of cutoff-specific number of bins. See rdplot() for details.
binselectvec	vector of cutoff-specific bins selection method. See rdplot() for details.
scalevec	vector of cutoff-specific scale factors. See rdplot() for details.
supportmat	matrix of cutoff-specific support conditions. See rdplot() for details..
pvec	vector of cutoff-specific polynomial orders. See rdplot() for details.
hmat	matrix of cutoff-specific bandwidths. See rdplot() for details.
kernelvec	vector of cutoff-specific kernels. See rdplot() for details.
weightsvec	vector of cutoff-specific weights. See rdplot() for details.
covs_mat	matrix of covariates. See rdplot() for details.
covs_list	list of of covariates to be used in each cutoff.
covs_evalvec	vector indicating the evaluation point for additional covariates. See rdrobust() for details.
covs_dropvec	vector indicating whether collinear covariates should be dropped at each cutoff. See rdrobust() for details.
ginv.tolvec	vector of cutoff-specific tolerances for generalized inverse calculations. See rdplot() for details.
masspointsvec	vector indicating how to handle repeated values at each cutoff. See rdplot() for details.
ci	adds confidence intervals of the specified level to the plot. See rdrobust() for details.
shade	passes the shaded confidence interval option to rdplot().
col_bins	vector of colors for bins.
pch_bins	vector of characters (pch) type for bins.
col_poly	vector of colors for polynomial curves.
lty_poly	vector of lty for polynomial curves.

col_xline	vector of colors for vertical lines.
lty_xline	vector of lty for vertical lines.
nobins	omits bins plot.
nopoly	omits polynomial curve plot.
noxline	omits vertical lines indicating the cutoffs.
nodraw	omits plot.
subset	optional subset of observations to use.
data	optional data frame for resolving string variable names.

Value

clist	list of cutoffs
cnum	number of cutoffs
X0	matrix of X values for control units
X1	matrix of X values for treated units
Yhat0	estimated polynomial for control units
Yhat1	estimated polynomial for treated units
Xmean	bin average of X values
Ymean	bin average for Y values
CI_l	lower end of confidence intervals
CI_r	upper end of confidence intervals
cfail	Cutoffs where rdrobust() encountered problems

Author(s)

Matias D. Cattaneo, Princeton University. <matias.d.cattaneo@gmail.com>

Rocio Titiunik, Princeton University. <rocio.titiunik@gmail.com>

Gonzalo Vazquez-Bare, UC Santa Barbara. <gvazquezbare@gmail.com>

References

Cattaneo, M.D., R. Titiunik and G. Vazquez-Bare. (2020). Analysis of Regression Discontinuity Designs with Multiple Cutoffs or Multiple Scores. *Stata Journal*, forthcoming.

Examples

```
# Toy dataset
X <- runif(1000,0,100)
C <- c(rep(33,500),rep(66,500))
Y <- (1 + X + (X>=C))*(C==33)+(.5 + .5*X + .8*(X>=C))*(C==66) + rnorm(1000)
# rdmcplot with standard syntax
tmp <- rdmcplot(Y,X,C)
```

rdms *Point estimation and robust bias-corrected inference for multi-score designs*

Description

rdms() implements point estimation and robust bias-corrected inference for Regression Discontinuity (RD) designs with multiple scores, including cumulative-cutoff designs and designs with two running variables.

Usage

```
rdms(
  Y,
  X,
  C,
  X2 = NULL,
  zvar = NULL,
  C2 = NULL,
  rangemat = NULL,
  xnorm = NULL,
  fuzzy = NULL,
  derivvec = NULL,
  pooled_opt = NULL,
  pvec = NULL,
  qvec = NULL,
  hmat = NULL,
  bmat = NULL,
  rhovec = NULL,
  covs_mat = NULL,
  covs_list = NULL,
  covs_dropvec = NULL,
  kernelvec = NULL,
  weightsvec = NULL,
  bwselectvec = NULL,
  scaleparvec = NULL,
  scaleregulvec = NULL,
  masspointsvec = NULL,
  bwcheckvec = NULL,
  bwrestrictvec = NULL,
  stdvarsvec = NULL,
  vcevec = NULL,
  nnmatchvec = NULL,
  cluster = NULL,
  ginv.tolvec = NULL,
  sharpbwvec = NULL,
  level = 95,
```

```
  plot = FALSE,
  conventional = FALSE,
  subset = NULL,
  data = NULL
)
```

Arguments

Y	outcome variable.
X	running variable.
C	vector of cutoffs.
X2	if specified, second running variable.
zvar	if X2 is specified, treatment indicator.
C2	if specified, second vector of cutoffs.
rangemat	matrix of cutoff-specific ranges for the running variable.
xnorm	normalized running variable to estimate pooled effect.
fuzzy	specifies a fuzzy design. See rdrobust() for details.
derivvec	vector of cutoff-specific order of derivatives. See rdrobust() for details.
pooled_opt	options to be passed to rdrobust() to calculate pooled estimand.
pvec	vector of cutoff-specific polynomial orders. See rdrobust() for details.
qvec	vector of cutoff-specific polynomial orders for bias estimation. See rdrobust() for details.
hmat	matrix of cutoff-specific bandwidths. See rdrobust() for details.
bmat	matrix of cutoff-specific bandwidths for bias estimation. See rdrobust() for details.
rhovec	vector of cutoff-specific values of rho. See rdrobust() for details.
covs_mat	matrix of covariates. See rdplot() for details.
covs_list	list of of covariates to be used in each cutoff.
covs_dropvec	vector indicating whether collinear covariates should be dropped at each cutoff. See rdrobust() for details.
kernelvec	vector of cutoff-specific kernels. See rdrobust() for details.
weightsvec	vector of length equal to the number of cutoffs indicating the names of the variables to be used as weights in each cutoff. See rdrobust() for details.
bwselectvec	vector of cutoff-specific bandwidth selection methods. See rdrobust() for details.
scaleparvec	vector of cutoff-specific scale parameters. See rdrobust() for details.
scaleregulvec	vector of cutoff-specific scale regularization parameters. See rdrobust() for details.
masspointsvec	vector indicating how to handle repeated values at each cutoff. See rdrobust() for details.

bwcheckvec	vector indicating the value of bwcheck at each cutoff. See rdrobust() for details.
bwrestrictvec	vector indicating whether computed bandwidths are restricted to the range or runvar at each cutoff. See rdrobust() for details.
stdvarsvec	vector indicating whether variables are standardized at each cutoff. See rdrobust() for details.
vcevec	vector of cutoff-specific variance-covariance estimation methods. See rdrobust() for details.
nnmatchvec	vector of cutoff-specific nearest neighbors for variance estimation. See rdrobust() for details.
cluster	cluster ID variable. See rdrobust() for details.
ginv.tolvec	vector of cutoff-specific tolerances for generalized inverse calculations. See rdrobust() for details.
sharpbwvec	vector indicating whether fuzzy RD bandwidth selection uses the sharp RD model at each cutoff. See rdrobust() for details.
level	confidence level for confidence intervals. See rdrobust() for details.
plot	plots cutoff-specific and pooled estimates.
conventional	reports conventional, instead of robust-bias corrected, p-values and confidence intervals.
subset	optional subset of observations to use.
data	optional data frame for resolving string variable names.

Value

B	vector of bias-corrected coefficients
V	variance-covariance matrix of the estimators
Coefs	vector of conventional coefficients
Nh	vector of sample sizes within bandwidth at each cutoff
CI	bias corrected confidence intervals
H	bandwidth used at each cutoff
Pv	vector of robust p-values

Author(s)

Matias D. Cattaneo, Princeton University. <matias.d.cattaneo@gmail.com>

Rocio Titiunik, Princeton University. <rocio.titiunik@gmail.com>

Gonzalo Vazquez-Bare, UC Santa Barbara. <gvazquezbare@gmail.com>

References

Cattaneo, M.D., R. Titiunik and G. Vazquez-Bare. (2020). Analysis of Regression Discontinuity Designs with Multiple Cutoffs or Multiple Scores. *Stata Journal*, forthcoming.

Examples

```
# Toy dataset: cumulative cutoffs
X <- runif(1000,0,100)
C <- c(33,66)
Y <- (1+X)*(X<C[1])+(0.8+0.8*X)*(X>=C[1]&X<C[2])+(1.2+1.2*X)*(X>=C[2]) + rnorm(1000)
# rmds: basic syntax
tmp <- rdms(Y,X,C)
```

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