



Title

rdmc — Analysis of Regression Discontinuity Designs with Multiple Cutoffs.

Syntax

```
rdmc depvar runvar [if] [in], cvar(string) [ fuzzy(string) derivvar(string)
pooled_opt(string) verbose pvar(string) qvar(string) hvar(string)
hrightvar(string) bvar(string) brightvar(string) rho(string)
covsvar(string) covsdropvar(string) kernelvar(string) weightsvar(string)
bwselectvar(string) scaleparvar(string) scaleregulvar(string)
masspointsvr(string) bwcheckvar(string) bwrestrictvar(string)
stdvarsvar(string) vcevar(string) level(#) plot graph_opt(string) ]
```

Description

rdmc provides tools to analyze regression discontinuity (RD) designs with multiple cutoffs. For methodological background see [Keele and Titiunik \(2015\)](#), [Cattaneo, Keele, Titiunik and Vazquez-Bare \(2016\)](#), and [Cattaneo, Keele, Titiunik and Vazquez-Bare \(2021\)](#). It also computes alternative estimation and inference procedures available in the literature.

Companion commands are: **rdmcpplot** for multi-cutoff RD plots, and **rdms** for multi-score RD estimation and inference.

A detailed introduction to this command is given in [Cattaneo, Titiunik and Vazquez-Bare \(2020\)](#).

Companion R functions are also available [here](#).

This command employs the Stata (and R) package **rdrobust** for underlying calculations. See [Calonico, Cattaneo and Titiunik \(2014\)](#), [Calonico, Cattaneo and Titiunik \(2015\)](#), and [Calonico, Cattaneo, Farrell and Titiunik \(2017\)](#) for more details.

Related Stata and R packages useful for inference in RD designs are described in the following website:

<https://rdpackages.github.io/>

Options

Estimand

cvar(string) specifies the numeric variable containing the RD cutoff for *indepvar* for each unit in the sample.

fuzzy(string) indicates a fuzzy design. See [rdrobust](#) for details.

derivvar(string) a variable of length equal to the number of different cutoffs that specifies the order of the derivative for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

rdrobust Options

pooled_opt(string) specifies the options to be passed to **rdrobust** to calculate pooled estimates. See [rdrobust](#) for details.

verbose displays the output from **rdrobust** for estimating the pooled estimand.

Local Polynomial Regression

pvar(string) a variable of length equal to the number of different cutoffs that specifies the order of the polynomials for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

qvar(*string*) a variable of length equal to the number of different cutoffs that specifies the order of the polynomials for bias estimation for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

hvar(*string*) a variable of length equal to the number of different cutoffs that specifies the bandwidths for **rdrobust** to calculate cutoff-specific estimates. When **hrightvar** is specified, **hvar** indicates the bandwidth to the left of the cutoff. When **hrightvar** is not specified, the same bandwidths are used at each side. See [rdrobust](#) for details.

hrightvar(*string*) a variable of length equal to the number of different cutoffs that specifies the bandwidths to the right of the cutoff for **rdrobust** to calculate cutoff-specific estimates. When **hrightvar** is not specified, the bandwidths in **hvar** are used at each side. See [rdrobust](#) for details.

bvar(*string*) a variable of length equal to the number of different cutoffs that specifies the bandwidths for bias estimation for **rdrobust** to calculate cutoff-specific estimates. When **brightvar** is specified, **bvar** indicates the bandwidth to the left of the cutoff. When **brightvar** is not specified, the same bandwidths are used at each side. See [rdrobust](#) for details.

brightvar(*string*) a variable of length equal to the number of different cutoffs that specifies the bandwidths for bias estimation to the right of the cutoff for **rdrobust** to calculate cutoff-specific estimates. When **brightvar** is not specified, the bandwidths in **bvar** are used at each side. See [rdrobust](#) for details.

rho(*string*) a variable of length equal to the number of different cutoffs that specifies the value of rho for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

covs(*string*) a variable of length equal to the number of different cutoffs that specifies the covariates for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

covsdrop(*string*) a variable of length equal to the number of different cutoffs that specifies whether collinear covariates should be dropped. See [rdrobust](#) for details.

kernel(*string*) a variable of length equal to the number of different cutoffs that specifies the kernels for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

weights(*string*) a variable of length equal to the number of different cutoffs that specifies the weights for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

Bandwidth Selection

bwselect(*string*) a variable of length equal to the number of different cutoffs that specifies the bandwidth selection method for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

scalepar(*string*) a variable of length equal to the number of different cutoffs that specifies the value of scalepar for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

scaleregul(*string*) a variable of length equal to the number of different cutoffs that specifies the value of scaleregul for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

masspoints(*string*) a variable of length equal to the number of different cutoffs that specifies how to handle repeated values in the running variable. See [rdrobust](#) for details.

bwcheck(*string*) a variable of length equal to the number of different cutoffs that specifies the value of **bwcheck**. See [rdrobust](#) for details.

bwrestrictvar(*string*) a variable of length equal to the number of different cutoffs that specifies whether computed bandwidths are restricted to the range of *runvar*. See [rdrobust](#) for details.

stdvarsvar(*string*) a variable of length equal to the number of different cutoffs that specifies whether *depvar* and *runvar* are standardized. See [rdrobust](#) for details.

Variance-Covariance Estimation and Inference

vcevar(*string*) a variable of length equal to the number of different cutoffs that specifies the variance-covariance matrix estimation method for **rdrobust** to calculate cutoff-specific estimates. See [rdrobust](#) for details.

level(#) specifies the confidence level for confidence intervals. See [rdrobust](#) for details.

verbose displays conventional, instead of robust-bias corrected, p-values and confidence intervals.

Plot

plot plots the pooled and cutoff-specific estimates and the weights given by the pooled estimate to each cutoff-specific estimate.

graph_opt(*string*) options to be passed to the graph when **plot** is specified.

Examples

```
Standard use of rdmc
. rdmc yvar xvar, c(cvar)

rdmc with plots of estimates and weights
. rdmc yvar xvar, c(cvar) plot

rdmc showing output from rdrobust and specifying uniform kernel
. rdmc yvar xvar, c(cvar) verbose pooled_opt(kernel(uniform))
```

Saved results

rdmc saves the following in **e()**:

Scalars

e(tau_weight)	weighted estimate
e(se_weight_rb)	robust bias corrected s.e. for weighted estimate
e(pv_weight_rb)	robust bias corrected p-value for weighted estimate
e(ci_weight_l)	left limit of robust bias corrected confidence interval for weighted estimate
e(ci_weight_r)	right limit of robust bias corrected confidence interval for weighted estimate
e(N_h_l)	effective sample size to the left of the cutoff used to estimate weighted estimand
e(N_h_r)	effective sample size to the right of the cutoff used to estimate weighted estimand
e(tau_pool)	pooled estimate
e(se_rb)	robust bias corrected s.e. for pooled estimate
e(pv_rb)	robust bias corrected p-value
e(ci_rb_l)	left limit of robust bias corrected confidence interval
e(ci_rb_r)	right limit of robust bias corrected confidence interval
e(h_l)	bandwidth to the left of the cutoff used to estimate pooled estimand
e(h_r)	bandwidth to the right of the cutoff used to estimate pooled estimand
e(N_h_l)	sample size within bandwidth to the left of the cutoff

e(N_h_r) used to estimate pooled estimand
 sample size within bandwidth to the right of the cutoff
 used to estimate pooled estimand

Matrices

e(b) bias-corrected coefficient vector
e(V) robust variance-covariance matrix of the estimators
e(coefs) conventional coefficient vector
e(pv_rb) robust p-value vector
e(CI_rb) bias-corrected confidence intervals
e(H) vector of bandwidths at each side of each cutoff
e(weights) vector of weights for each cutoff-specific estimate
e(sampsis) vector of sample sizes at each side of each cutoff
e(c_failed) vector of cutoffs at which rdrobust encountered problems

References

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- Calonico, S., M. D. Cattaneo, and R. Titiunik. 2014. Robust Data-Driven Inference in the Regression-Discontinuity Design. *Stata Journal* 14(4): 909-946.
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- Cattaneo, M. D., L. Keele, R. Titiunik, and G. Vazquez-Bare. 2021. Extrapolating Treatment Effects in Multi-Cutoff Regression Discontinuity Designs. *Journal of American Statistical Association*, forthcoming.
- Cattaneo, M. D., R. Titiunik, and G. Vazquez-Bare. 2020. Analysis of Regression Discontinuity Designs with Multiple Cutoffs or Multiple Scores. *Stata Journal*, forthcoming.
- Keele, L., and R. Titiunik. 2015. Geographic Boundaries as Regression Discontinuities. *Political Analysis* 23(1): 127-155.

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