



## Title

**rdms** — Analysis of Regression Discontinuity Designs with Multiple Scores.

## Syntax

```
rdms depvar runvar1 [runvar2 treatvar] [if] [in], cvar(cvar1 [cvar2]) [
  range(range1 [range2]) xnorm(string) fuzzy(string) derivvar(string)
  pooled_opt(string) 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) masspointsvar(string)
  bwcheckvar(string) bwrestrictvar(string) stdvarsvar(string) vcevar(string)
  level(#) plot graph_opt(string) ]
```

## Description

**rdms** provides tools to analyze regression discontinuity (RD) designs with multiple scores. 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.

If only *runvar1* is specified, **rdms** analyzes an RD design with cumulative cutoffs in which a unit gets different dosages of a treatment depending on the value of *runvar1*. If *runvar1*, *runvar2* and *treatvar* are specified, **rdms** analyzes an RD design with two running variables in which units with *treatvar* equal to one are treated.

Companion commands are: [rdmc](#) for multi-cutoff RD estimation and inference, and [rdmcpplot](#) for multi-cutoff RD plots.

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

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Estimand

**cvar**(*string*) specifies the numeric variable *cvar1* containing the RD cutoff for *indepvar* in a cumulative cutoffs setting, or the two scores *cvar1* and *cvar2* in a two-score setting.

**range**(*range1* [*range2*]) specifies the range of the running variable to be used for estimation around each cutoff. Specifying only one variable implies using the same range at each side of the cutoff.

**xnorm**(*string*) specifies the normalized running variable to estimate pooled effect.

**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.

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### rdrobust Options

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

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### Local Polynomial Regression

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**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.

**rhovar**(*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.

**covsvar**(*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.

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

**kernelvar**(*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.

**weightsvar**(*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.

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### Bandwidth Selection

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**bwselectvar**(*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.

**scaleparvar**(*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.

**scaleregulvar**(*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.

**masspointsvar**(*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.

**bwcheckvar**(*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.

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#### Variance-Covariance Estimation

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**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.

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#### Plot

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**plot** plots the pooled and cutoff-specific estimates.

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

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### Examples

Standard use of rdms for cumulative cutoffs  
`. rdms yvar xvar, c(cvar)`

rdms with plot  
`. rdms yvar xvar, c(cvar) plot`

Standard use of rdms for multiple scores  
`. rdms yvar xvar1 xvar2 treatvar, c(cvar)`

### Saved results

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

#### Matrices

<b>e(b)</b>	bias-corrected coefficient vector
<b>e(V)</b>	robust variance-covariance matrix of the estimators
<b>e(coefs)</b>	conventional coefficient vector
<b>e(pv_rb)</b>	robust p-value vector
<b>e(CI_rb)</b>	bias-corrected confidence intervals
<b>e(H)</b>	vector of bandwidths at each side of each cutoff
<b>e(sampsis)</b>	vector of sample sizes at each side of each cutoff

### References

- Calonico, S., M. D. Cattaneo, M. H. 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.
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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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