Statistics/Data analysis

## Title

**rdbwhte** — Data-driven bandwidth selection for RD Heterogeneous Treatment Effects.

## Syntax

**rdbwhte** *depvar runvar* [*if*] [*in*] [, **covs_hte(***covars***) c(***#***) p(***#***) q(***#***)**
**kernel(***kernelfn***) vce(***vcetype [vceopt1 vceopt2]***) level(***#***) covs_eff(***covars***)**
**bwjoint labels** ]

## Description

**rdbwhte** provides data-driven bandwidth selection for estimation and inference of heterogeneous treatment effects in RD designs (Calonico, Cattaneo, Farrell, Palomba and Titiunik, 2025a).

Companion commands are: rdhte for estimation and inference, and rdhte_lincom for testing linear restrictions of paramaters.

A detailed introduction to **rdhte** in Stata is given in Calonico, Cattaneo, Farrell, Palomba and Titiunik (2025b).

Related software packages for analysis and interpretation of RD designs and related methods are available in:

https://rdpackages.github.io/

For background methodology, see Calonico, Cattaneo, Farrell, and Titiunik (2019), Calonico, Cattaneo and Farrell (2020), Cattaneo and Titiunik (2022).

## Options

### Estimand

**c(***#***)** specifies the RD cutoff for *indepvar*. Default is **c(0)**.

**covs_hte(***covars***)** specifies covariate(s) for heterogeneous treatment effects. Factor variables notation can be used to distinguish between continuous and categorical variables, select reference categories, specify interactions between variables, and include polynomials of continuous variables. If not specified, the RD Average Treatment Effect bandwidth is computed.

**labels** displays the final bandwidth estimates using variable labels from **covs_hte(***covars***)**.

### Local Polynomial Regression

**p(***#***)** specifies the order of the local polynomial used to construct the point estimator. Default is **p(1)** (local linear regression).

**q(***#***)** specifies the order of the local polynomial used to construct the bias correction. Default is **q(2)** (local quadratic regression).

**kernel(***kernelfn***)** specifies the kernel function used to construct the local-polynomial estimator(s). Options are: **triangular**, **epanechnikov**, and **uniform**. Default is **kernel(triangular)**.

**covs_eff(***covars***)** specifies additional covariates to be used for efficiency improvements.

### Variance-Covariance Estimation

**vce(***vcetype [vceopt1 vceopt2]***)** specifies the procedure used to compute the variance-covariance matrix estimator. Options are:
**vce(hc1)** for heteroskedasticity-robust plug-in residuals variance estimator with *hc1* weights.
**vce(hc2)** for heteroskedasticity-robust plug-in residuals variance estimator with *hc2* weights.
**vce(hc3)** for heteroskedasticity-robust plug-in residuals variance estimator with *hc3* weights.
**vce(cluster** *clustervar***)** for cluster-robust plug-in residuals variance estimation with degrees-of-freedom weights and *clustervar* indicating the cluster ID variable.
Default is **vce(hc3)**.

**level(#)** specifies confidence level for confidence intervals. Default is **level(95)**.

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**Example:**

Setup using Granzier, Pons, and Tricaud (2023) Data
. **use rdhte_dataset.dta**

RD-HTE Estimation by left/right groups
. **rdbwhte y x, covs_hte(i.w_left)**

RD-HTE Estimation using a continuous variable
. **rdbwhte y x, covs_hte(c.w_strength)**

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## Stored results

**rdbwhte** stores the following in **e()**:

Scalars

| | |
|---|---|
| **e(N)** | original number of observations |
| **e(c)** | cutoff value |
| **e(p)** | order of the polynomial used for estimation of the regression function |

Macros

| | |
|---|---|
| **e(runningvar)** | name of running variable |
| **e(outcomevar)** | name of outcome variable |
| **e(clustvar)** | name of cluster variable |
| **e(covs)** | name of covariates |
| **e(vce_select)** | vcetype specified in vce() |
| **e(kernel)** | kernel choice |

Matrices

| | |
|---|---|
| **e(h)** | bandwidths |

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## References

Calonico, Cattaneo, Farrell, Palomba and Titiunik. 2025a. Treatment Effect Heterogeneity in Regression Discontinuity Designs. *Working Paper*.

Calonico, Cattaneo, Farrell, Palomba and Titiunik. 2025b. rdhte: Conditional Average Treatment Effects in RD Designs. *Working Paper*.

Granzier, Pons, and Tricaud. 2023. Coordination and Bandwagon Effects: How Past Rankings Shape the Behavior of Voters and Candidates. *American Economic Journal: Applied Economics*, 15(4): 177?217.

Cattaneo and Titiunik. 2022. Regression Discontinuity Designs. *Annual Review of Economics*, 14: 821–851.

Calonico, Cattaneo, and Farrell. 2020. Optimal Bandwidth Choice for Robust Bias Corrected Inference in Regression Discontinuity Designs. *Econometrics Journal*, 23(2): 192–210.

Calonico, Cattaneo, Farrell, and Titiunik. 2019. Regression Discontinuity Designs using Covariates. *Review of Economics and Statistics*, 101(3): 442–451.

Calonico, Cattaneo, and Titiunik. 2014. Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs. *Econometrica*, 82(6): 2295–2326.

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