```
> ## Figure 2: RDD analysis
>
> library(dplyr)
> library(ggplot2)
> library(reshape2)
> library(grid)
> library(rdlocrand)
> library(lubridate)
>
> ## Clear workspace
>
> rm(list=ls())
>
> ## Set working directory
> setwd("~/Dropbox/Documents/Projects/Active_Projects/Compulsory_Voting_BR/Replication_Files/PSRM/")
>
> ##Opening the voting data:
>
> load("ReplicationData.RData")
>
>
> ################
> #### 2008 ######
> ################
>
> ## Turnout variable
> data2008$turnout <- as.numeric(data2008$VOTOU.1°.TURNO) - 1
>
>
> ############################
> ## Discontinuity analysis ###
> ############################
>
> ## 18-year olds
>
> ## Election Day: subsetting the 14-day window
>
> data.18.rddED <- dplyr::filter(data2008, (dob >= "1990-09-29" & dob <= "1990-10-12") & turnout == 1)
>
> DataRDDED18 <- data.18.rddED %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDED18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDED18$WeekendHolidays <- as.numeric(weekdays(DataRDDED18$dob) %in% c("Saturday", "Sunday") |
+                                           DataRDDED18$dob=="1990-10-12")
>
> ##Excluding weekend days:
>
> DataRDDED18nowe <- DataRDDED18[ ! DataRDDED18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddED18nowe <- rdrandinf(DataRDDED18nowe$voters, DataRDDED18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             9
Order of poly     =             0
Kernel type       =       uniform
Reps              =           126
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           5
 Eff. number of obs           4           5
```

```
    Mean of outcome    5823.000    6473.600
    S.d. of outcome     272.323     419.656
             Window      -7.000       6.000

================================================================================
                               Finite sample           Large sample
                            ------------------  ----------------------------
         Statistic          T        P>|T|        P>|T|    Power vs d = 136.162
================================================================================
     Diff. in means    650.600        0.056        0.005                   0.090
================================================================================

95% confidence interval: [172.15,1129.05]
>
> ## % increase
> estimateED2008 <- rddED18nowe$obs.stat/rddED18nowe$sumstats[3,1]*100
> estimateED2008
[1] 11.17293
>
> ## % increase: lower bound
> estimateED2008lw <- rddED18nowe$ci[1]/rddED18nowe$sumstats[3,1]*100
> estimateED2008lw
[1] 2.95638
>
> ## % increase: upper bound
> estimateED2008up <- rddED18nowe$ci[2]/rddED18nowe$sumstats[3,1]*100
> estimateED2008up
[1] 19.38949
>
>
> ## End-of-Year: subsetting the 14-day window
>
> data.18.rddEoY <- dplyr::filter(data2008, (dob >= "1990-12-25" & dob <= "1991-01-07") & turnout == 1)
>
> DataRDDEoY18 <- data.18.rddEoY %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDEoY18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDEoY18$WeekendHolidays <- as.numeric(weekdays(DataRDDEoY18$dob) %in% c("Saturday", "Sunday") |
DataRDDEoY18$dob=="1990-12-24" | DataRDDEoY18$dob=="1990-12-25" | DataRDDEoY18$dob=="1990-12-31" | DataRDDEoY18$dob=="1991-01-01")
>
> ##Excluding weekend days:
>
> DataRDDEoY18nowe <- DataRDDEoY18[ ! DataRDDEoY18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddEoY18nowe <- rdrandinf(DataRDDEoY18nowe$voters, DataRDDEoY18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             7
Order of poly     =             0
Kernel type       =       uniform
Reps              =            35
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           3
 Eff. number of obs           4           3
    Mean of outcome    4664.500    5042.667
    S.d. of outcome     131.733      18.148
             Window      -7.000       6.000

================================================================================
```

```
                              Finite sample           Large sample
                            ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  65.867
================================================================================
     Diff. in means    378.167        0.029        0.000                   0.167
================================================================================

95% confidence interval: [182.88,495.72]
>
> ## % increase
> estimateEoY2008 <- rddEoY18nowe$obs.stat/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2008
[1] 8.107336
>
> ## % increase: lower bound
> estimateEoY2008lw <- rddEoY18nowe$ci[1]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2008lw
[1] 3.920677
>
> ## % increase: upper bound
> estimateEoY2008up <- rddEoY18nowe$ci[2]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2008up
[1] 10.62751
>
>
> ################
> #### 2010 ######
> ################
>
> ## Turnout variable
> data2010$turnout <- as.numeric(data2010$VOTOU.1°.TURNO) - 1
>
>
> ##############################
> ## Discontinuity analysis ###
> ##############################
>
> ## 18-year olds
>
> ## Election Day: subsetting the 14-day window
>
> data.18.rddED <- dplyr::filter(data2010, (dob >= "1992-09-27" & dob <= "1992-10-10") & turnout == 1)
>
> DataRDDED18 <- data.18.rddED %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDED18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDED18$WeekendHolidays <- as.numeric(weekdays(DataRDDED18$dob) %in% c("Saturday", "Sunday"))
>
> ##Excluding weekend days:
>
> DataRDDED18nowe <- DataRDDED18[ ! DataRDDED18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddED18nowe <- rdrandinf(DataRDDED18nowe$voters, DataRDDED18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =            10
Order of poly     =             0
Kernel type       =       uniform
Reps              =           252
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins
```

```
Cutoff c =    0.000   Left of c  Right of c
      Number of obs           5           5
 Eff. number of obs           5           5
    Mean of outcome    5006.400    6011.600
    S.d. of outcome     187.233     174.334
             Window      -7.000       6.000

================================================================================
                                Finite sample            Large sample
                              ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  93.617
================================================================================
     Diff. in means   1005.200        0.000        0.000                   0.130
================================================================================

95% confidence interval: [780.96,1184.61]
>
> ## % increase
> estimateED2010 <- rddED18nowe$obs.stat/rddED18nowe$sumstats[3,1]*100
> estimateED2010
[1] 20.0783
>
> ## % increase: lower bound
> estimateED2010lw <- rddED18nowe$ci[1]/rddED18nowe$sumstats[3,1]*100
> estimateED2010lw
[1] 15.59923
>
> ## % increase: upper bound
> estimateED2010up <- rddED18nowe$ci[2]/rddED18nowe$sumstats[3,1]*100
> estimateED2010up
[1] 23.66191
>
>
> ## End-of-Year: subsetting the 14-day window
>
> data.18.rddEoY <- dplyr::filter(data2010, (dob >= "1992-12-25" & dob <= "1993-01-07") & turnout == 1)
>
> DataRDDEoY18 <- data.18.rddEoY %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDEoY18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDEoY18$WeekendHolidays <- as.numeric(weekdays(DataRDDEoY18$dob) %in% c("Saturday", "Sunday") |
DataRDDEoY18$dob=="1992-12-24" | DataRDDEoY18$dob=="1992-12-25" | DataRDDEoY18$dob=="1992-12-31" | DataRDDEoY18$dob=="1993-01-01")
>
> ##Excluding weekend days:
>
> DataRDDEoY18nowe <- DataRDDEoY18[ ! DataRDDEoY18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddEoY18nowe <- rdrandinf(DataRDDEoY18nowe$voters, DataRDDEoY18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             7
Order of poly     =             0
Kernel type       =       uniform
Reps              =            35
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           3
 Eff. number of obs           4           3
    Mean of outcome    3574.250    4015.000
    S.d. of outcome     115.589     139.216
```

```
            Window      -7.000       6.000

================================================================================
                                 Finite sample           Large sample
                              ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  57.795
================================================================================
     Diff. in means    440.750        0.029        0.000                   0.090
================================================================================

95% confidence interval: [206.41,553.09]
>
> ## % increase
> estimateEoY2010 <- rddEoY18nowe$obs.stat/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2010
[1] 12.33126
>
> ## % increase: lower bound
> estimateEoY2010lw <- rddEoY18nowe$ci[1]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2010lw
[1] 5.774918
>
> ## % increase: upper bound
> estimateEoY2010up <- rddEoY18nowe$ci[2]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2010up
[1] 15.4743
>
>
> ################
> #### 2012 ######
> ################
>
> ## Turnout variable
> data2012$turnout <- as.numeric(data2012$VOTOU.1°.TURNO) - 1
>
>
> ## 18-year olds
>
> ## Election Day: subsetting the 14-day window
>
> data.18.rddED <- dplyr::filter(data2012, (dob >= "1994-10-01" & dob <= "1994-10-14") & turnout == 1)
>
> DataRDDED18 <- data.18.rddED %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDED18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDED18$WeekendHolidays <- as.numeric(weekdays(DataRDDED18$dob) %in% c("Saturday", "Sunday") | DataRDDED18$dob=="1994-10-12")
>
> ##Excluding weekend days:
>
> DataRDDED18nowe <- DataRDDED18[ ! DataRDDED18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddED18nowe <- rdrandinf(DataRDDED18nowe$voters, DataRDDED18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             9
Order of poly     =             0
Kernel type       =       uniform
Reps              =           126
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
```

```
     Number of obs           4           5
 Eff. number of obs          4           5
    Mean of outcome    5609.500    6425.200
    S.d. of outcome     301.218     342.475
             Window      -7.000       6.000

================================================================================
                               Finite sample            Large sample
                            ------------------  -----------------------------
         Statistic          T        P>|T|        P>|T|    Power vs d = 150.609
================================================================================
     Diff. in means    815.700        0.024        0.000                 0.108
================================================================================

95% confidence interval: [292.39,1194.46]
>
> ## % increase
> estimateED2012 <- rddED18nowe$obs.stat/rddED18nowe$sumstats[3,1]*100
> estimateED2012
[1] 14.5414
>
> ## % increase: lower bound
> estimateED2012lw <- rddED18nowe$ci[1]/rddED18nowe$sumstats[3,1]*100
> estimateED2012lw
[1] 5.212408
>
> ## % increase: upper bound
> estimateED2012up <- rddED18nowe$ci[2]/rddED18nowe$sumstats[3,1]*100
> estimateED2012up
[1] 21.29352
>
>
> ## End-of-Year: subsetting the 14-day window
>
> data.18.rddEoY <- dplyr::filter(data2012, (dob >= "1994-12-25" & dob <= "1995-01-07") & turnout == 1)
>
> DataRDDEoY18 <- data.18.rddEoY %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDEoY18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDEoY18$WeekendHolidays <- as.numeric(weekdays(DataRDDEoY18$dob) %in% c("Saturday", "Sunday") |
DataRDDEoY18$dob=="1994-12-24" | DataRDDEoY18$dob=="1994-12-25" | DataRDDEoY18$dob=="1994-12-31" | DataRDDEoY18$dob=="1995-01-01")
>
> ##Excluding weekend days:
>
> DataRDDEoY18nowe <- DataRDDEoY18[ ! DataRDDEoY18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddEoY18nowe <- rdrandinf(DataRDDEoY18nowe$voters, DataRDDEoY18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =            10
Order of poly     =             0
Kernel type       =       uniform
Reps              =           252
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           5           5
 Eff. number of obs           5           5
    Mean of outcome    4406.800    4605.200
    S.d. of outcome      74.086     187.172
             Window      -7.000       6.000
```

```
================================================================================
                                 Finite sample           Large sample
                              ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  37.043
================================================================================
     Diff. in means    198.400        0.079        0.028                   0.070
================================================================================

95% confidence interval: [21.95,374.85]
>
> ## % increase
> estimateEoY2012 <- rddEoY18nowe$obs.stat/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2012
[1] 4.502133
>
> ## % increase: lower bound
> estimateEoY2012lw <- rddEoY18nowe$ci[1]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2012lw
[1] 0.4980939
>
> ## % increase: upper bound
> estimateEoY2012up <- rddEoY18nowe$ci[2]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2012up
[1] 8.506172
>
>
> ################
> #### 2014 ######
> ################
>
> ## Turnout variable
> data2014$turnout <- as.numeric(data2014$VOTOU.1°.TURNO) - 1
>
>
> ############################
> ## Discontinuity analysis ###
> ############################
>
> ## 18-year olds
>
> ## Election Day: subsetting the 14-day window
>
> data.18.rddED <- dplyr::filter(data2014, (dob >= "1996-09-29" & dob <= "1996-10-12") & turnout == 1)
>
> DataRDDED18 <- data.18.rddED %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDED18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDED18$WeekendHolidays <- as.numeric(weekdays(DataRDDED18$dob) %in% c("Saturday", "Sunday") |
+                                           DataRDDED18$dob=="1996-10-12")
>
> ##Excluding weekend days:
>
> DataRDDED18nowe <- DataRDDED18[ ! DataRDDED18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddED18nowe <- rdrandinf(DataRDDED18nowe$voters, DataRDDED18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =            10
Order of poly     =             0
Kernel type       =       uniform
Reps              =           252
Window            =   set by user
```

```
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           5           5
 Eff. number of obs           5           5
    Mean of outcome    4113.600    5269.800
    S.d. of outcome     410.544     433.551
             Window      -7.000       6.000

================================================================================
                                 Finite sample            Large sample
                               ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d = 205.272
================================================================================
     Diff. in means   1156.200        0.012        0.000                   0.120
================================================================================

95% confidence interval: [632.83,1679.53]
>
> ## % increase
> estimateED2014 <- rddED18nowe$obs.stat/rddED18nowe$sumstats[3,1]*100
> estimateED2014
[1] 28.10677
>
> ## % increase: lower bound
> estimateED2014lw <- rddED18nowe$ci[1]/rddED18nowe$sumstats[3,1]*100
> estimateED2014lw
[1] 15.38385
>
> ## % increase: upper bound
> estimateED2014up <- rddED18nowe$ci[2]/rddED18nowe$sumstats[3,1]*100
> estimateED2014up
[1] 40.82871
>
>
> ## End-of-Year: subsetting the 14-day window
>
> data.18.rddEoY <- dplyr::filter(data2014, (dob >= "1996-12-25" & dob <= "1997-01-07") & turnout == 1)
>
> DataRDDEoY18 <- data.18.rddEoY %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDEoY18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDEoY18$WeekendHolidays <- as.numeric(weekdays(DataRDDEoY18$dob) %in% c("Saturday", "Sunday") |
DataRDDEoY18$dob=="1996-12-24" | DataRDDEoY18$dob=="1996-12-25" | DataRDDEoY18$dob=="1996-12-31" | DataRDDEoY18$dob=="1997-01-01")
>
> ##Excluding weekend days:
>
> DataRDDEoY18nowe <- DataRDDEoY18[ ! DataRDDEoY18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddEoY18nowe <- rdrandinf(DataRDDEoY18nowe$voters, DataRDDEoY18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             7
Order of poly     =             0
Kernel type       =       uniform
Reps              =            35
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           3
```

```
 Eff. number of obs           4           3
    Mean of outcome    2755.250    3147.000
    S.d. of outcome      61.223     189.787
             Window      -7.000       6.000

================================================================================
                               Finite sample            Large sample
                             ------------------  -----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  30.611
================================================================================
     Diff. in means    391.750        0.029        0.001                   0.058
================================================================================

95% confidence interval: [157.03,572.2]
>
> ## % increase
> estimateEoY2014 <- rddEoY18nowe$obs.stat/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2014
[1] 14.21831
>
> ## % increase: lower bound
> estimateEoY2014lw <- rddEoY18nowe$ci[1]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2014lw
[1] 5.699301
>
> ## % increase: upper bound
> estimateEoY2014up <- rddEoY18nowe$ci[2]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2014up
[1] 20.76763
>
>
> ################
> #### 2016 ######
> ################
>
> ## Turnout variable
> data2016$turnout <- as.numeric(data2016$VOTOU.1°.TURNO) - 1
>
>
> ##############################
> ## Discontinuity analysis ###
> ##############################
>
> ## 18-year olds
>
> ## Election Day: subsetting the 14-day window
>
> data.18.rddED <- dplyr::filter(data2016, (dob >= "1998-09-26" & dob <= "1998-10-09") & turnout == 1)
>
> DataRDDED18 <- data.18.rddED %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDED18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDED18$WeekendHolidays <- as.numeric(weekdays(DataRDDED18$dob) %in% c("Saturday", "Sunday"))
>
> ##Excluding weekend days:
>
> DataRDDED18nowe <- DataRDDED18[ ! DataRDDED18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddED18nowe <- rdrandinf(DataRDDED18nowe$voters, DataRDDED18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =            10
Order of poly     =             0
```

```
Kernel type       =       uniform
Reps              =           252
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           5           5
 Eff. number of obs           5           5
    Mean of outcome    4750.000    5438.600
    S.d. of outcome     139.354     184.581
             Window      -7.000       6.000

================================================================================
                               Finite sample            Large sample
                            ------------------  -----------------------------
         Statistic          T        P>|T|        P>|T|    Power vs d =  69.677
================================================================================
     Diff. in means    688.600        0.000        0.000                   0.103
================================================================================

95% confidence interval: [437.21,801.08]
>
> ## % increase
> estimateED2016 <- rddED18nowe$obs.stat/rddED18nowe$sumstats[3,1]*100
> estimateED2016
[1] 14.49684
>
> ## % increase: lower bound
> estimateED2016lw <- rddED18nowe$ci[1]/rddED18nowe$sumstats[3,1]*100
> estimateED2016lw
[1] 9.204421
>
> ## % increase: upper bound
> estimateED2016up <- rddED18nowe$ci[2]/rddED18nowe$sumstats[3,1]*100
> estimateED2016up
[1] 16.86484
>
>
> ## End-of-Year: subsetting the 14-day window
>
> data.18.rddEoY <- dplyr::filter(data2016, (dob >= "1998-12-25" & dob <= "1999-01-07") & turnout == 1)
>
> DataRDDEoY18 <- data.18.rddEoY %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDEoY18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDEoY18$WeekendHolidays <- as.numeric(weekdays(DataRDDEoY18$dob) %in% c("Saturday", "Sunday") |
DataRDDEoY18$dob=="1998-12-24" | DataRDDEoY18$dob=="1998-12-25" | DataRDDEoY18$dob=="1998-12-31" | DataRDDEoY18$dob=="1999-01-01")
>
> ##Excluding weekend days:
>
> DataRDDEoY18nowe <- DataRDDEoY18[ ! DataRDDEoY18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddEoY18nowe <- rdrandinf(DataRDDEoY18nowe$voters, DataRDDEoY18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             7
Order of poly     =             0
Kernel type       =       uniform
Reps              =            35
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins
```

```
Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           3
 Eff. number of obs           4           3
    Mean of outcome    3666.250    3969.000
    S.d. of outcome     143.987     320.323
             Window      -7.000       6.000

================================================================================
                               Finite sample            Large sample
                             ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  71.993
================================================================================
     Diff. in means    302.750        0.114        0.127                   0.065
================================================================================

95% confidence interval: [-132.99,599.61]
>
> ## % increase
> estimateEoY2016 <- rddEoY18nowe$obs.stat/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2016
[1] 8.257757
>
> ## % increase: lower bound
> estimateEoY2016lw <- rddEoY18nowe$ci[1]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2016lw
[1] -3.627412
>
> ## % increase: upper bound
> estimateEoY2016up <- rddEoY18nowe$ci[2]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2016up
[1] 16.35486
>
>
> ################
> #### 2018 ######
> ################
>
> ## Turnout variable
> data2018$turnout <- as.numeric(data2018$VOTOU.1º.TURNO) - 1
>
>
> ##############################
> ## Discontinuity analysis ###
> ##############################
>
> ## 18-year olds
>
> ## Election Day: subsetting the 14-day window
>
> data.18.rddED <- dplyr::filter(data2018, (dob >= "2000-10-01" & dob <= "2000-10-14") & turnout == 1)
>
> DataRDDED18 <- data.18.rddED %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDED18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDED18$WeekendHolidays <- as.numeric(weekdays(DataRDDED18$dob) %in% c("Saturday", "Sunday") |
+                                           DataRDDED18$dob=="2000-10-12")
>
> ##Excluding weekend days:
>
> DataRDDED18nowe <- DataRDDED18[ ! DataRDDED18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddED18nowe <- rdrandinf(DataRDDED18nowe$voters, DataRDDED18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.
```

```
Number of obs     =             9
Order of poly     =             0
Kernel type       =       uniform
Reps              =           126
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           5
 Eff. number of obs           4           5
    Mean of outcome    3744.000    4439.000
    S.d. of outcome     334.209     286.812
             Window      -7.000       6.000

================================================================================
                                 Finite sample            Large sample
                               ------------------  ----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d = 167.104
================================================================================
     Diff. in means    695.000        0.008        0.001                   0.125
================================================================================

95% confidence interval: [290.01,1019.01]
>
> ## % increase
> estimateED2018 <- rddED18nowe$obs.stat/rddED18nowe$sumstats[3,1]*100
> estimateED2018
[1] 18.56303
>
> ## % increase: lower bound
> estimateED2018lw <- rddED18nowe$ci[1]/rddED18nowe$sumstats[3,1]*100
> estimateED2018lw
[1] 7.745994
>
> ## % increase: upper bound
> estimateED2018up <- rddED18nowe$ci[2]/rddED18nowe$sumstats[3,1]*100
> estimateED2018up
[1] 27.21715
>
>
> ## End-of-Year: subsetting the 14-day window
>
> data.18.rddEoY <- dplyr::filter(data2018, (dob >= "2000-12-25" & dob <= "2001-01-07") & turnout == 1)
>
> DataRDDEoY18 <- data.18.rddEoY %>%
+   filter(GRAU.INSTRUÇÃO != "Analfabeto") %>%
+   group_by(dob) %>%
+   summarise(voters = n(),
+             turnout = unique(turnout))
`summarise()` ungrouping output (override with `.groups` argument)
>
> DataRDDEoY18$daysToFrom <- seq(6, -7, by = -1)
>
> ##Identifying weekend days and holidays:
>
> DataRDDEoY18$WeekendHolidays <- as.numeric(weekdays(DataRDDEoY18$dob) %in% c("Saturday", "Sunday") |
DataRDDEoY18$dob=="2000-12-24" | DataRDDEoY18$dob=="2000-12-25" | DataRDDEoY18$dob=="2000-12-31" | DataRDDEoY18$dob=="2001-01-01")
>
> ##Excluding weekend days:
>
> DataRDDEoY18nowe <- DataRDDEoY18[ ! DataRDDEoY18$WeekendHolidays==1,]
>
> ##Using the rdlocrand package
>
> rddEoY18nowe <- rdrandinf(DataRDDEoY18nowe$voters, DataRDDEoY18nowe$daysToFrom, wl = -7, wr = 6, seed = 50, ci = .05)

Selected window = [-7;6]

Running randomization-based test...
Randomization-based test complete.

Running sensitivity analysis...
Sensitivity analysis complete.


Number of obs     =             8
Order of poly     =             0
Kernel type       =       uniform
```

```
Reps              =            70
Window            =   set by user
H0:          tau  =             0
Randomization     = fixed margins

Cutoff c =    0.000   Left of c  Right of c
      Number of obs           4           4
 Eff. number of obs           4           4
    Mean of outcome    2470.000    2740.500
    S.d. of outcome      67.261     224.655
             Window      -7.000       6.000

================================================================================
                                 Finite sample            Large sample
                              ------------------  -----------------------------
          Statistic          T        P>|T|        P>|T|    Power vs d =  33.630
================================================================================
     Diff. in means    270.500        0.143        0.021                   0.059
================================================================================

95% confidence interval: [40.68,500.28]
>
> ## % increase
> estimateEoY2018 <- rddEoY18nowe$obs.stat/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2018
[1] 10.95142
>
> ## % increase: lower bound
> estimateEoY2018lw <- rddEoY18nowe$ci[1]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2018lw
[1] 1.646964
>
> ## % increase: upper bound
> estimateEoY2018up <- rddEoY18nowe$ci[2]/rddEoY18nowe$sumstats[3,1]*100
> estimateEoY2018up
[1] 20.25425
>
>
>
> ## Figure 2: plotting the effects with CI
>
> setEPS()
> postscript("Figure_2_Effects_of_CV.eps",  width = 7.5, height = 4.5)
>
> par(mfrow = c(1, 2), mar = c(1, 4, 1, 1), las = 1)
>
> plot(c(0.1, 0.2, 0.3), c(estimateED2010, estimateED2014, estimateED2018), pch = c(16), xlim = c(0, 0.8), ylim = c(-4.2, 48),
+      xlab = "", ylab = "Estimate increase in %", main = "", axes = FALSE)
>
> points(c(0.5, 0.6, 0.7), c(estimateEoY2010, estimateEoY2014, estimateEoY2018), pch = c(17))
>
> axis(side = 2, at = seq(from = -2, to = 42, by = 4), cex.axis=0.79, las=1)
>
> text(.1, -4.2, "2010", cex = .6, font = 2)
> text(.2, -4.2, "2014", cex = .6, font = 2)
> text(.3, -4.2, "2018", cex = .6, font = 2)
> text(.5, -4.2, "2010", cex = .6, font = 2)
> text(.6, -4.2, "2014", cex = .6, font = 2)
> text(.7, -4.2, "2018", cex = .6, font = 2)
>
> lines(c(0.1, 0.1), c(estimateED2010lw, estimateED2010up))
> lines(c(0.2, 0.2), c(estimateED2014lw, estimateED2014up))
> lines(c(0.3, 0.3), c(estimateED2018lw, estimateED2018up))
>
> lines(c(0.5, 0.5), c(estimateEoY2010lw, estimateEoY2010up))
> lines(c(0.6, 0.6), c(estimateEoY2014lw, estimateEoY2014up))
> lines(c(0.7, 0.7), c(estimateEoY2018lw, estimateEoY2018up))
>
> abline(h = 0, lty = "dashed")
>
> text(.2, 44, "Election Day", cex = 1, font = 1)
> text(.6, 44, "End-of-year", cex = 1, font = 1)
>
> text(.4, 47, "Presidential elections", cex = 1.2, font = 2)
>
>
> plot(c(0.1, 0.2, 0.3), c(estimateED2008, estimateED2012, estimateED2016), pch = c(16), xlim = c(0, 0.8), ylim = c(-4.2, 48),
+      xlab = "", ylab = "Estimate increase in %", main = "", axes = FALSE)
>
> points(c(0.5, 0.6, 0.7), c(estimateEoY2008, estimateEoY2012, estimateEoY2016), pch = c(17))
>
```

```
> axis(side = 2, at = seq(from = -2, to = 42, by = 4), cex.axis=0.79, las=1)
>
> text(.1, -4.2, "2008", cex = .6, font = 2)
> text(.2, -4.2, "2012", cex = .6, font = 2)
> text(.3, -4.2, "2016", cex = .6, font = 2)
> text(.5, -4.2, "2008", cex = .6, font = 2)
> text(.6, -4.2, "2012", cex = .6, font = 2)
> text(.7, -4.2, "2016", cex = .6, font = 2)
>
> lines(c(0.1, 0.1), c(estimateED2008lw, estimateED2008up))
> lines(c(0.2, 0.2), c(estimateED2012lw, estimateED2012up))
> lines(c(0.3, 0.3), c(estimateED2016lw, estimateED2016up))
>
> lines(c(0.5, 0.5), c(estimateEoY2008lw, estimateEoY2008up))
> lines(c(0.6, 0.6), c(estimateEoY2012lw, estimateEoY2012up))
> lines(c(0.7, 0.7), c(estimateEoY2016lw, estimateEoY2016up))
>
> abline(h = 0, lty = "dashed")
>
> text(.2, 44, "Election Day", cex = 1, font = 1)
> text(.6, 44, "End-of-year", cex = 1, font = 1)
>
> text(.4, 47, "Municipal elections", cex = 1.2, font = 2)
>
> dev.off()
null device
          1
>
>
>
>
```