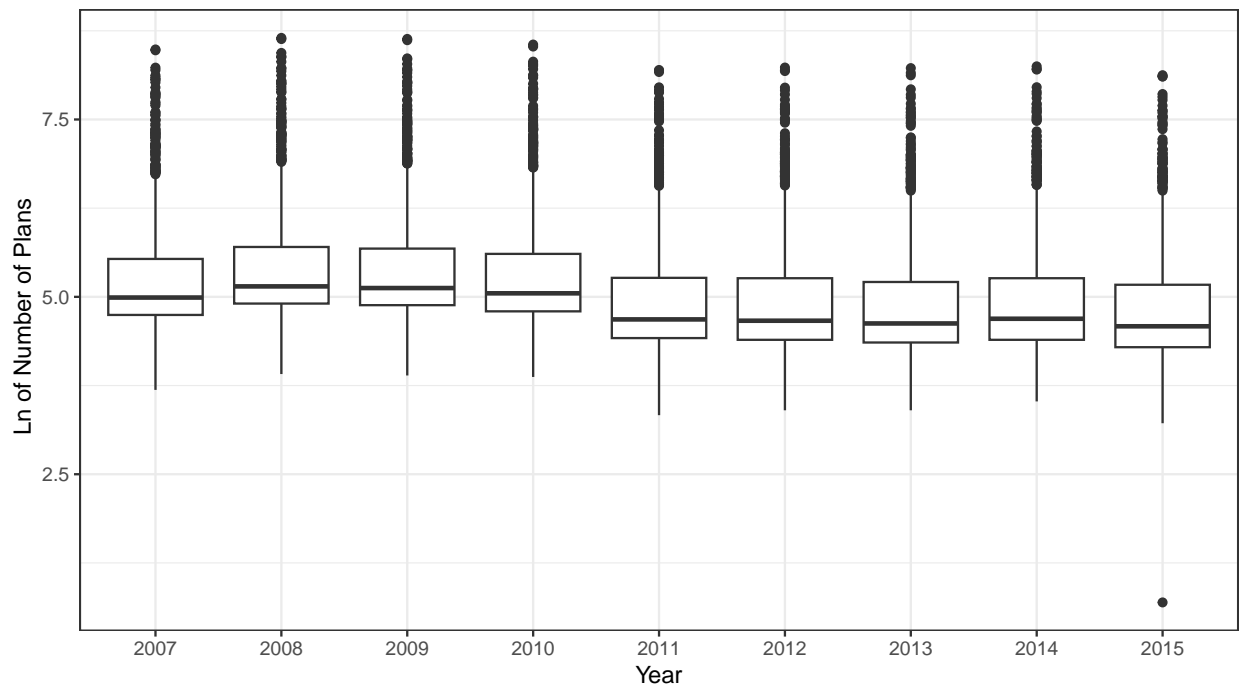# Homework 4

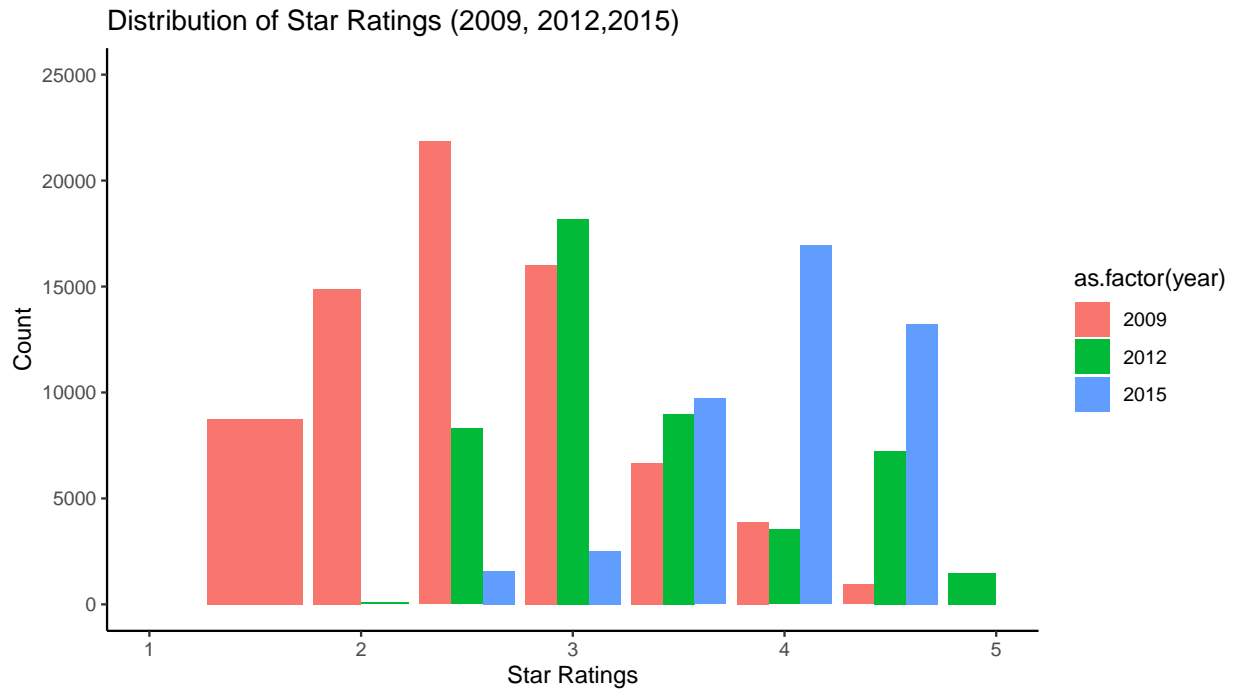## Alexia Witthaus Viñé

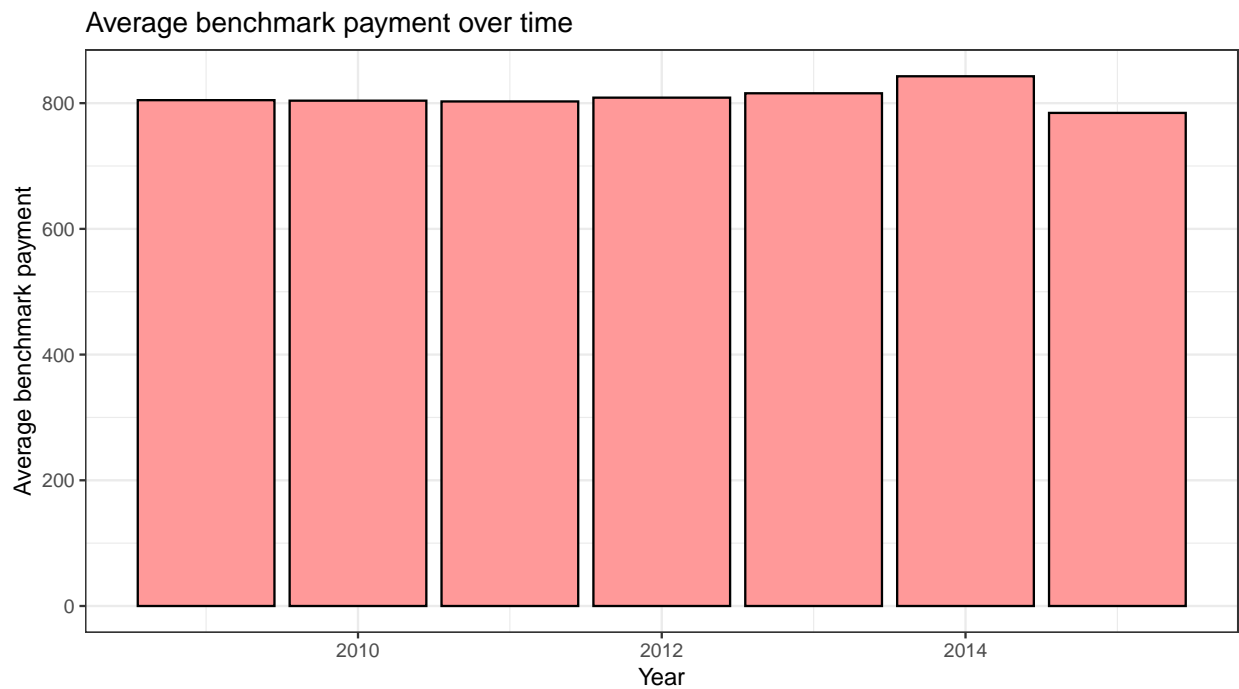## 2023-04-05

Summarize the data

Given that most outliers are above, I would say there are too little plans.

Distribution of Star Ratings (2009, 2012,2015)

Hopspitals seem to have higher ratings overall. The average rating seems to increase year by year.

Average benchmark payment over time

Benchmark prices have increased significantly from 2011-2014 and have decreased drastically in 2015.

Share of Medicare Advantage over time
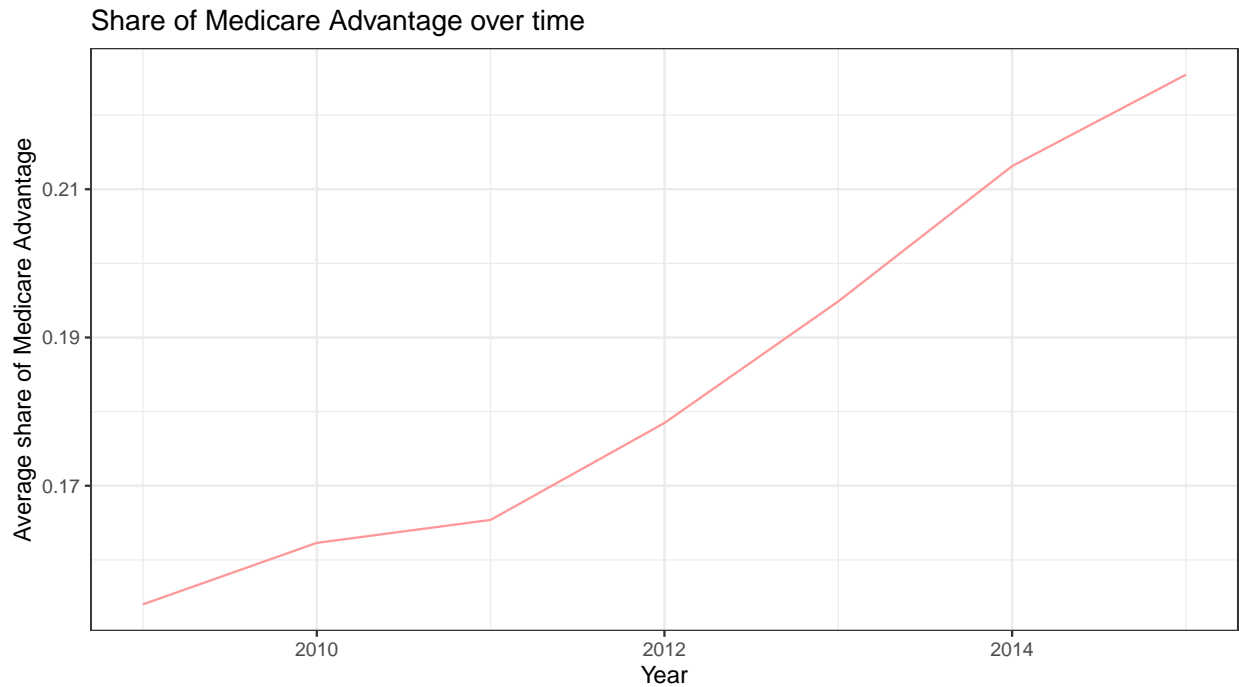
Medicare has increased in popularity. However, the slope seems to decrease over time. This might be correlated with the fact that Benchmark Payment has decreased in recent years.

Estimate ATE's

Question1

```
## # A tibble: 7 x 2
##   Star_Rating avg_ind
##         <dbl>   <dbl>
## 1         1.5    5435
## 2         2       934
## 3         2.5    6948
## 4         3     13069
## 5         3.5    4905
## 6         4      3023
## 7         4.5     937
```

Question 2

```
## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                 18986
## BW type                       Manual
## Kernel                       Uniform
## VCE method                       HC0
##
## Number of Obs.                 11208         7778
## Eff. Number of Obs.              270         1683
```

```
## Order est. (p)                      1            1
## Order bias  (q)                      2            2
## BW est. (h)                      0.125        0.125
## BW bias (b)                      0.125        0.125
## rho (h/b)                        1.000        1.000
##
## =================================================================
##         Method    Coef. Std. Err.      z    P>|z|     [ 95% C.I. ]
## =================================================================
##    Conventional    0.017    0.004    4.277    0.000    [0.009 , 0.025]
##          Robust        -        -    2.554    0.011    [0.007 , 0.052]
## =================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.               18986
## BW type                     Manual
## Kernel                     Uniform
## VCE method                     HC0
##
## Number of Obs.               15331         3655
## Eff. Number of Obs.            914          664
## Order est. (p)                   1            1
## Order bias  (q)                  2            2
## BW est. (h)                  0.125        0.125
## BW bias (b)                  0.125        0.125
## rho (h/b)                    1.000        1.000
##
## =================================================================
##         Method    Coef. Std. Err.      z    P>|z|     [ 95% C.I. ]
## =================================================================
##    Conventional    0.013    0.003    3.961    0.000    [0.006 , 0.019]
##          Robust        -        -    6.899    0.000    [0.021 , 0.037]
## =================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.               18986
## BW type                     Manual
## Kernel                     Uniform
## VCE method                     HC0
##
## Number of Obs.               17640         1346
## Eff. Number of Obs.            646          640
## Order est. (p)                   1            1
## Order bias  (q)                  2            2
## BW est. (h)                  0.125        0.125
## BW bias (b)                  0.125        0.125
## rho (h/b)                    1.000        1.000
##
## =================================================================
##         Method    Coef. Std. Err.      z    P>|z|     [ 95% C.I. ]
## =================================================================
##    Conventional   -0.003    0.002   -1.255    0.210    [-0.008 , 0.002]
```

```
##        Robust         -        -      -2.096     0.036    [-0.017 , -0.001]
## =================================================================================
```

It seems as if the higher the rating, the less of an influence the rating has over the market share. # Question 3

```
## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                18986
## BW type                      Manual
## Kernel                      Uniform
## VCE method                     HC0
##
## Number of Obs.                11208          7778
## Eff. Number of Obs.             181           522
## Order est. (p)                    1             1
## Order bias  (q)                   2             2
## BW est. (h)                   0.100         0.100
## BW bias (b)                   0.100         0.100
## rho (h/b)                     1.000         1.000
##
## =================================================================================
##        Method    Coef. Std. Err.        z     P>|z|      [ 95% C.I. ]
## =================================================================================
##   Conventional   0.012     0.004     3.480     0.001    [0.005 , 0.019]
##        Robust        -        -      2.310     0.021    [0.006 , 0.079]
## =================================================================================


## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                18986
## BW type                      Manual
## Kernel                      Uniform
## VCE method                     HC0
##
## Number of Obs.                11208          7778
## Eff. Number of Obs.             260          1680
## Order est. (p)                    1             1
## Order bias  (q)                   2             2
## BW est. (h)                   0.120         0.120
## BW bias (b)                   0.120         0.120
## rho (h/b)                     1.000         1.000
##
## =================================================================================
##        Method    Coef. Std. Err.        z     P>|z|      [ 95% C.I. ]
## =================================================================================
##   Conventional   0.020     0.004     4.738     0.000    [0.012 , 0.029]
##        Robust        -        -      0.786     0.432    [-0.017 , 0.040]
## =================================================================================


## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                18986
```

5

```
## BW type                    Manual
## Kernel                     Uniform
## VCE method                    HC0
##
## Number of Obs.             11208        7778
## Eff. Number of Obs.          270        1683
## Order est. (p)                 1           1
## Order bias  (q)                2           2
## BW est. (h)                0.130       0.130
## BW bias (b)                0.130       0.130
## rho (h/b)                  1.000       1.000
##
## =================================================================
##        Method    Coef. Std. Err.       z     P>|z|    [ 95% C.I. ]
## =================================================================
##    Conventional  0.017     0.004    4.277     0.000  [0.009 , 0.025]
##        Robust        -         -    2.554     0.011  [0.007 , 0.052]
## =================================================================


## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.             18986
## BW type                    Manual
## Kernel                     Uniform
## VCE method                    HC0
##
## Number of Obs.             11208        7778
## Eff. Number of Obs.         3966        1916
## Order est. (p)                 1           1
## Order bias  (q)                2           2
## BW est. (h)                0.140       0.140
## BW bias (b)                0.140       0.140
## rho (h/b)                  1.000       1.000
##
## =================================================================
##        Method    Coef. Std. Err.       z     P>|z|    [ 95% C.I. ]
## =================================================================
##    Conventional  0.008     0.003    2.882     0.004  [0.003 , 0.013]
##        Robust        -         -    3.907     0.000  [0.019 , 0.056]
## =================================================================
```
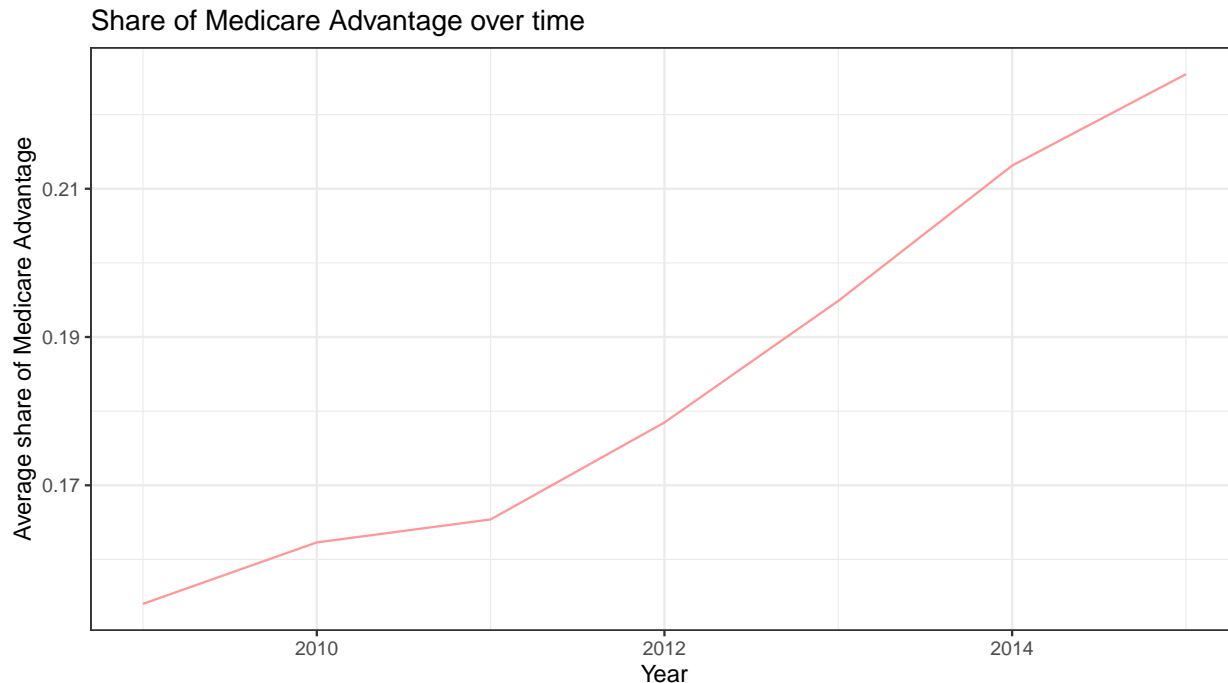
It seems as if the bandwidth does influence the results. However, all of them remain statistically significant.

Question 4

Share of Medicare Advantage over time

Question 5

```
## # A tibble: 5 x 2
##   negative avg_hmo
##      <dbl>   <dbl>
## 1        0  1
## 2        1  0.145
## 3        1  0.230
## 4        0  0.622
## 5        1  0.0915
```

```
## # A tibble: 5 x 2
##   negative avg_partd
##      <dbl>     <dbl>
## 1        0     1
## 2        1     0.871
## 3        1     0.641
## 4        0     0.728
## 5        1     0.612
```

Question 6

From my previous anaysis, it seems like the effect of the star rating on market share is big when the star rating is low, but the importance of the rating decreases as the rating increases. Unfortunately, we couldn't work with the 4.5 rating, since there are no observations that were rounded down and that is a key assumption for RDD.