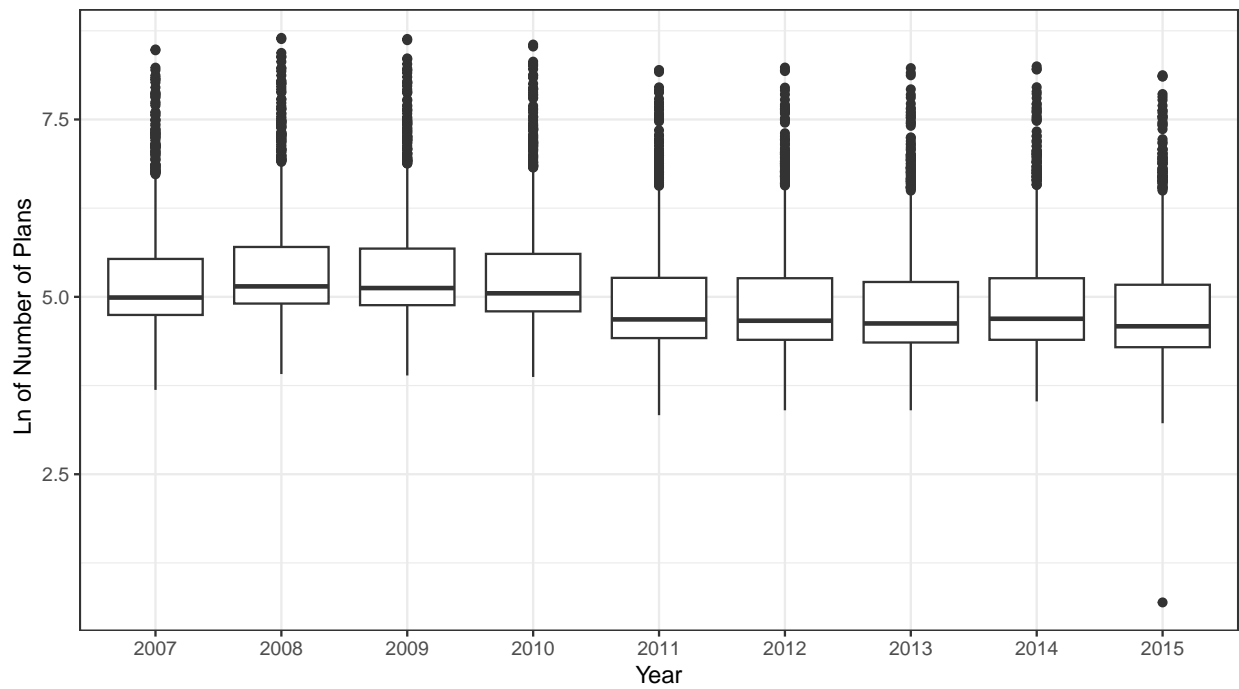


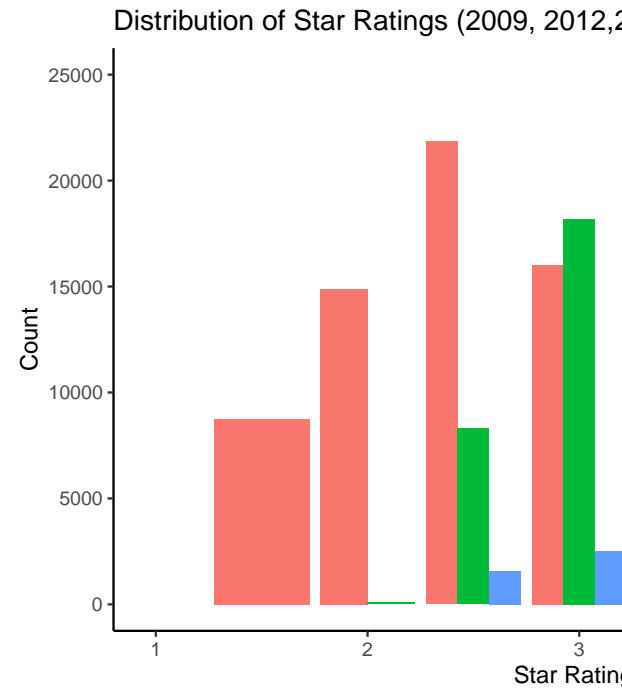
# Homework 4

Alexia Witthaus Viñé

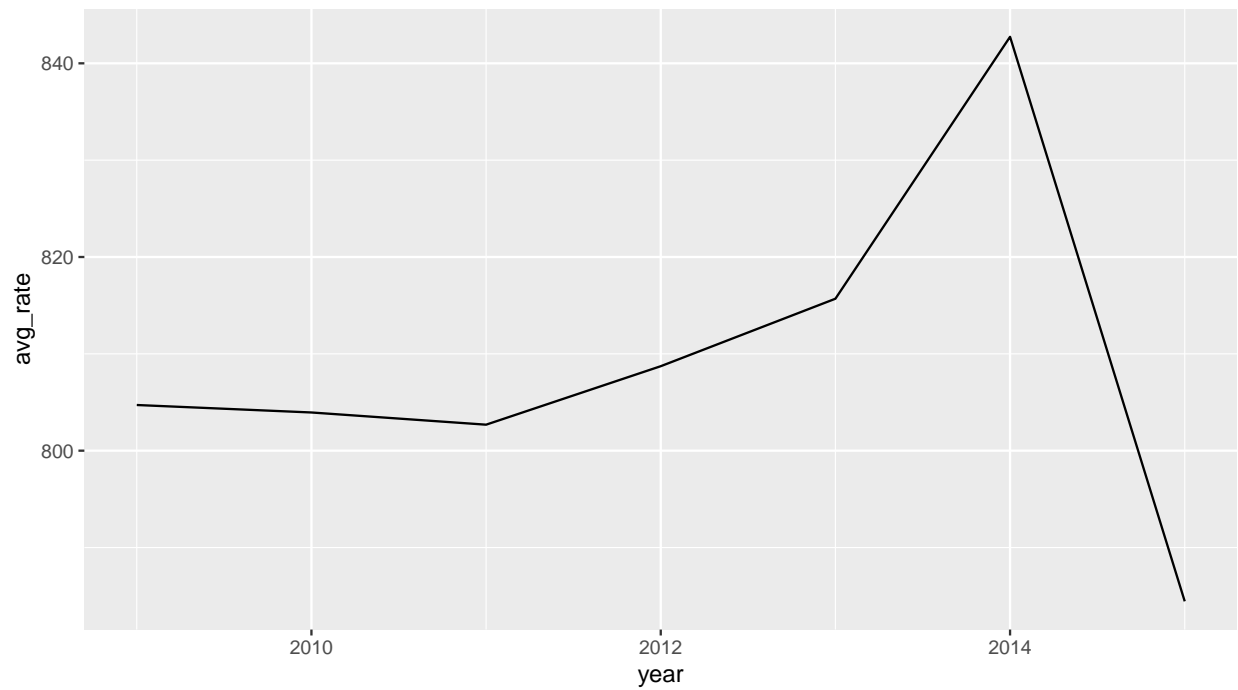
2023-04-02

Summarize the data

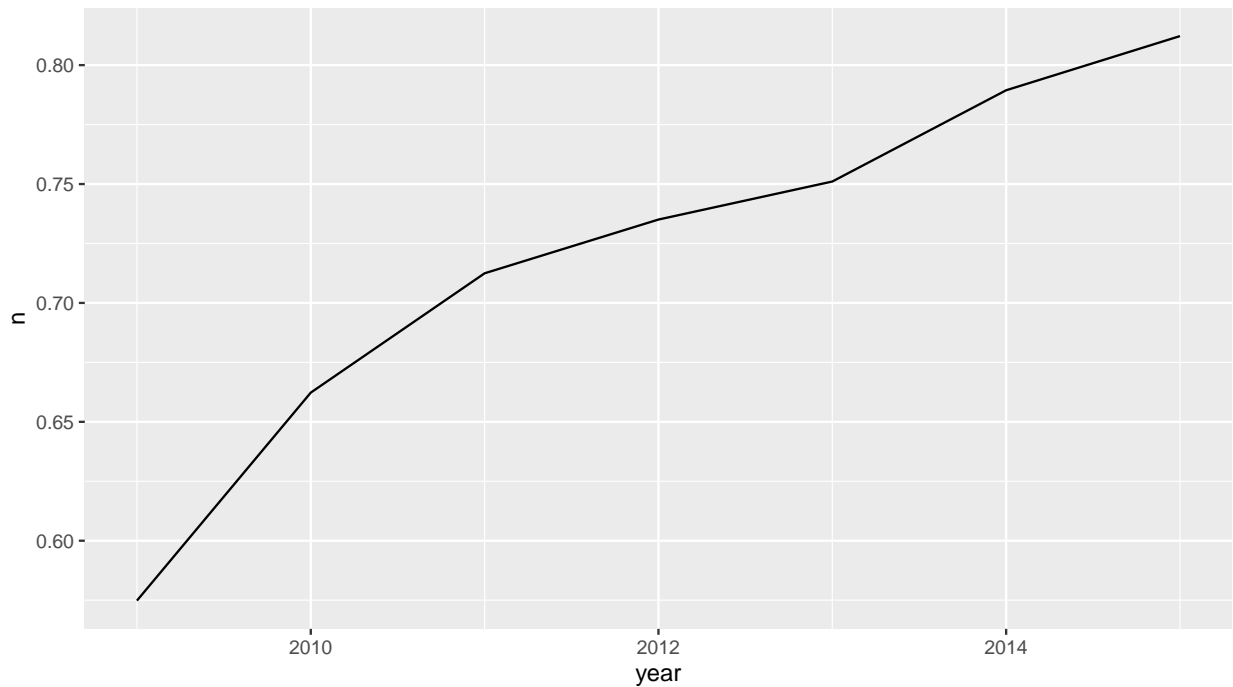




Given that most outliers are above, I would say there are too little plans.  
Hospitals seem to have higher ratings overall. The average rating seems to increase year by year.



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



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 0.000685
## 2         2   0.0410
## 3         2.5 0.317
## 4         3   0.750
## 5         3.5 0.691
## 6         4   0.777
## 7         4.5 1
```

### Question 2

```
## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.          18986
## BW type                Manual
## Kernel                  Uniform
## VCE method              HCO
##
## 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              HCO
##
## 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              HCO
##
## 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              HCO
##
## 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              HCO
##
## 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
```

```

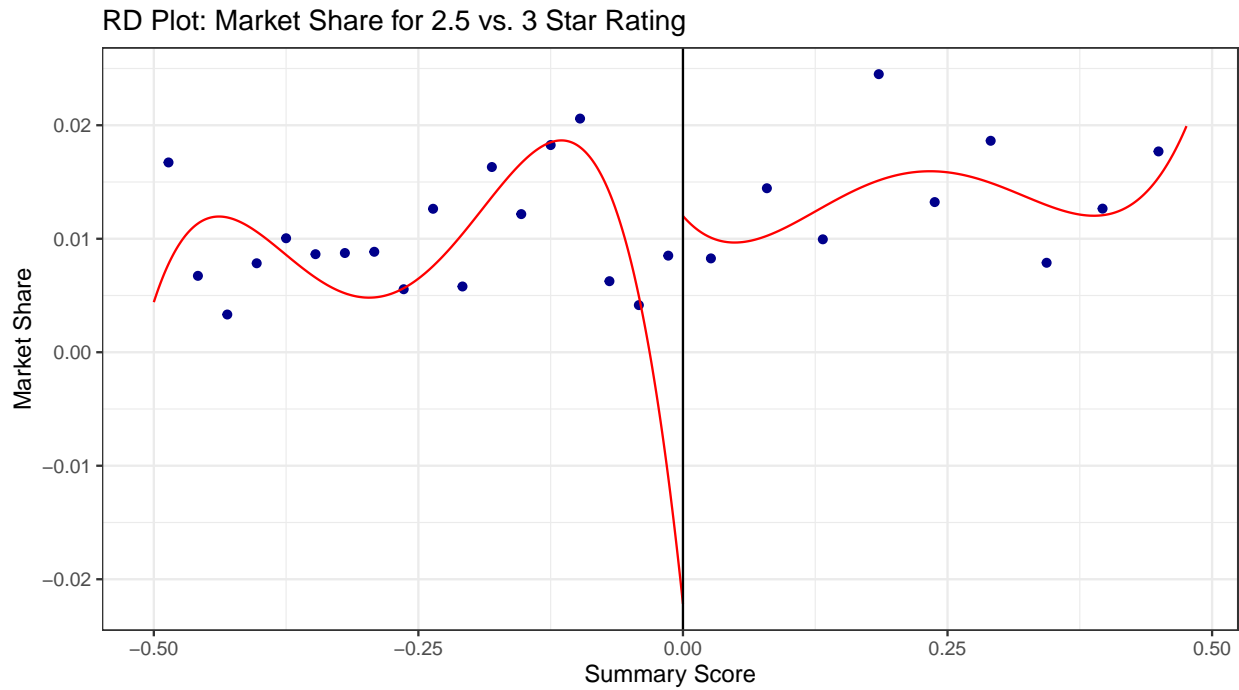
## BW type          Manual
## Kernel           Uniform
## VCE method       HCO
##
## Number of Obs.    11208      7778
## Eff. Number of Obs. 270      1683
## Order est. (p)    1          1
## Order bias (q)    2          2
## BW est. (h)       0.130      0.130
## BW bias (b)       0.130      0.130
## 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       HCO
##
## 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]
## =====

```

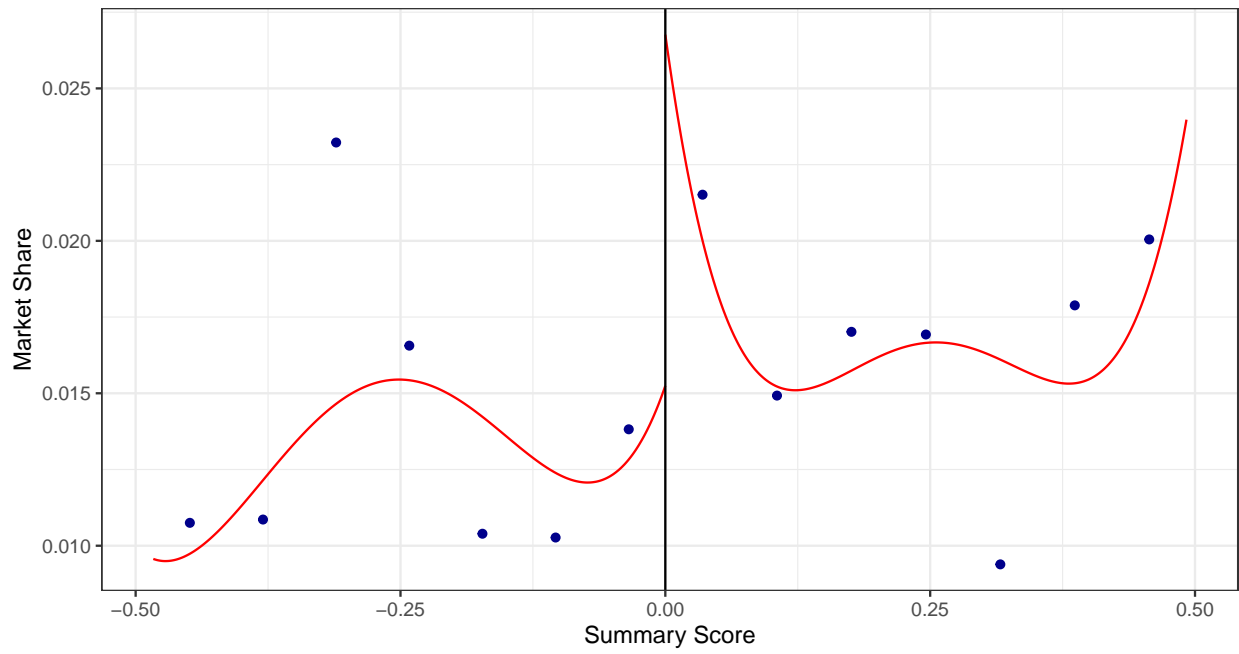
It seems as if the bandwidth does influence the results. However, all of them remain statistically significant.

## Question 4



```
## Call: rdplot
##
## Number of Obs.          10284
## Kernel                Uniform
##
## Number of Obs.          6586          3698
## Eff. Number of Obs.     6586          3698
## Order poly. fit (p)      4            4
## BW poly. fit (h)         0.500        0.476
## Number of bins scale     1.000        1.000
```

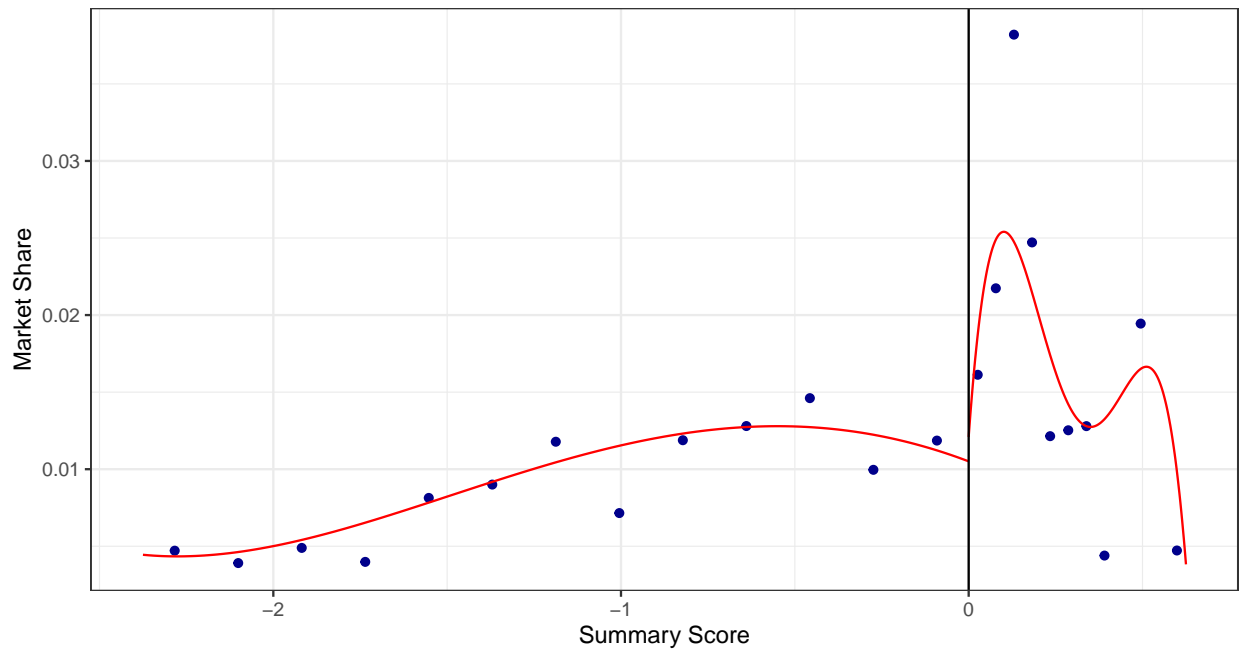
RD Plot: Market Share for 3 vs. 3.5 Star Rating



```
## Call: rdplot
##
## Number of Obs.          5908
## Kernel                  Uniform
##
## Number of Obs.          4123          1785
## Eff. Number of Obs.     4123          1785
## Order poly. fit (p)      4            4
## BW poly. fit (h)         0.483        0.492
## Number of bins scale     1.000        1.000
```



RD Plot: Market Share for 3.5 vs. 4 Star Rating



```
## Call: rdplot
##
## Number of Obs.      26214
## Kernel              Uniform
##
## Number of Obs.      24795      1419
## Eff. Number of Obs. 24795      1419
## Order poly. fit (p) 4          4
## BW poly. fit (h)    2.375      0.625
## Number of bins scale 1.000      1.000
```

## Question 5

```
## # A tibble: 2 x 2
##   above prop_partd
##   <dbl>      <dbl>
## 1     0      0.590
## 2     1      0.569
```

( Not sure how to get HMO? )

## Question 6

From my previous analysis, 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.