Homework 4 - Research in Health Economics

Ammarah Ahmed

1 Summarise the Data

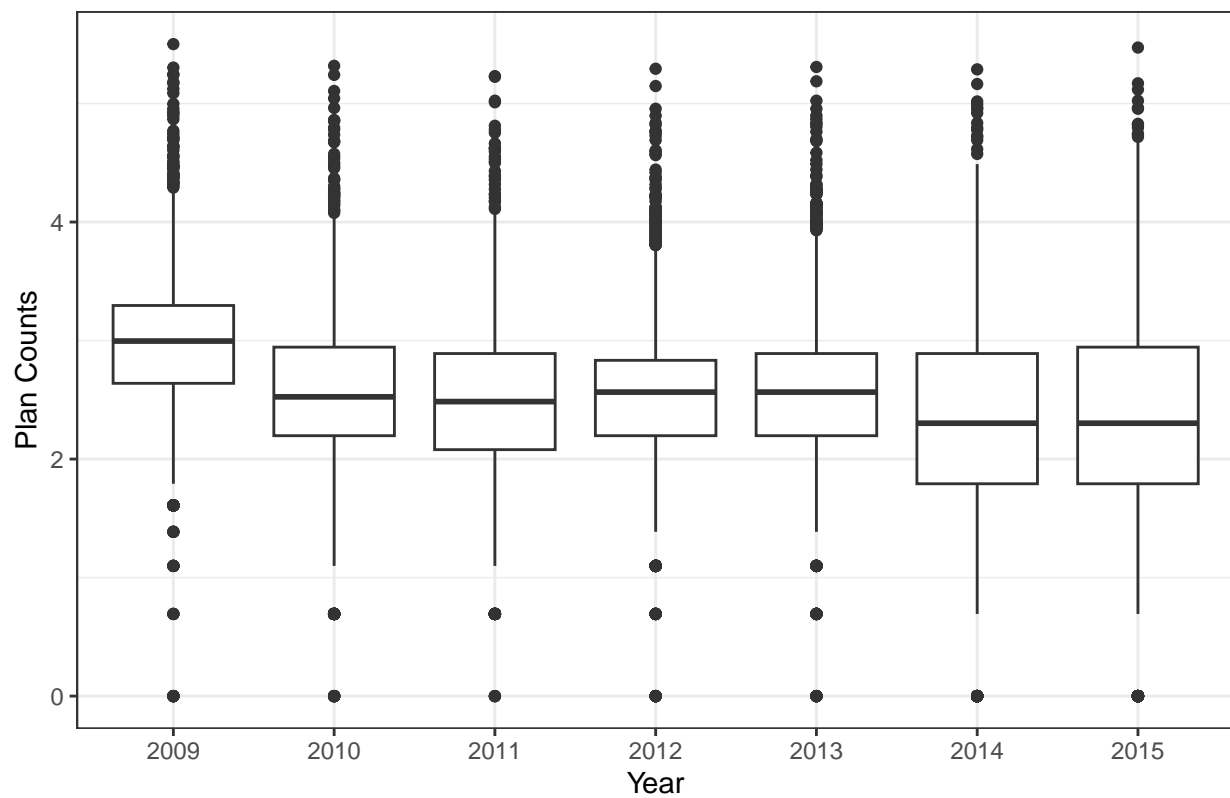### 1.1 Question 1

Distribution of Plan Counts by County

Figure 1: Distribution of Plan Counts by County

Figure 1 shows the distribution of plan counts by country per year. On average, each county has 3 plans or less which might be too few as these plans ight not cover everyone's needs regarding health insurance.

1.2 Question 2

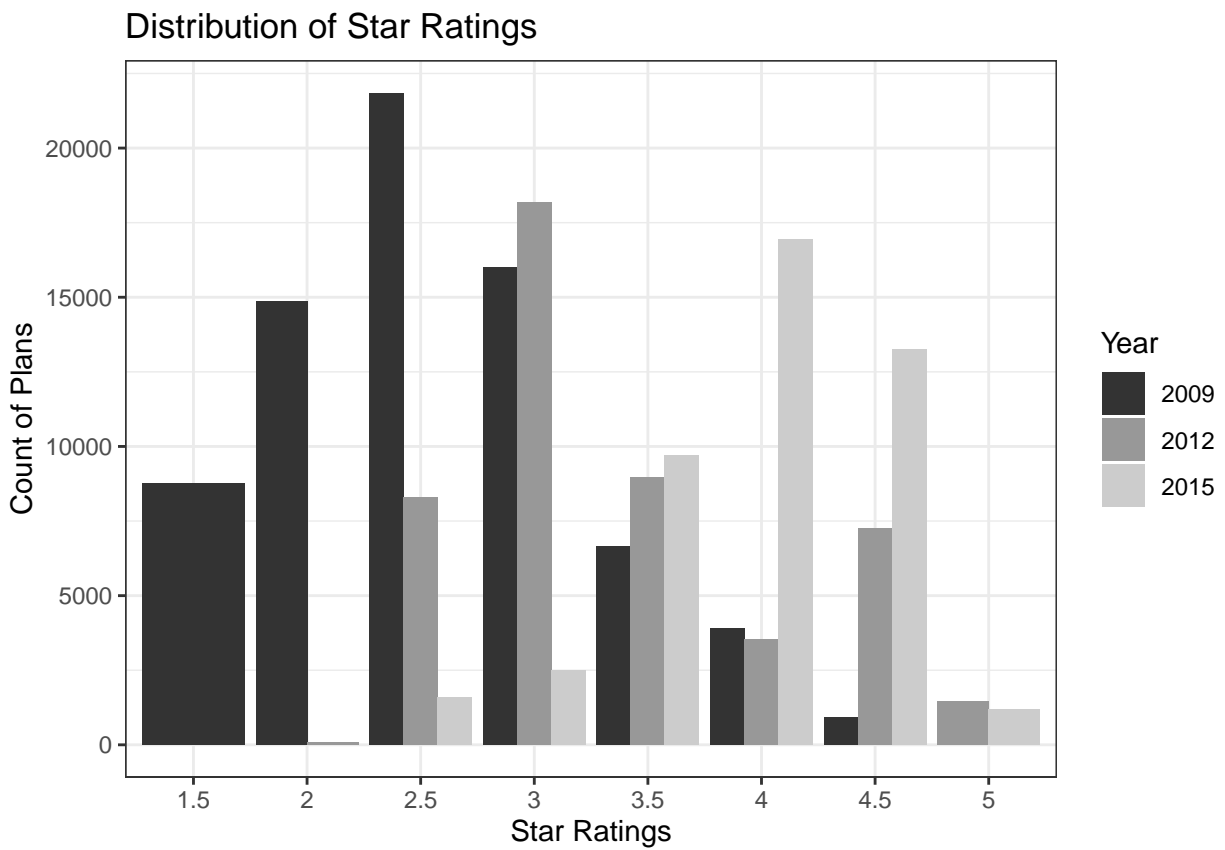### Distribution of Star Ratings

Figure 2: Distribution of Star Ratings (2009, 2012 & 2015)

The Distribution of Star Ratings for the years 2009, 2012 and 2015 are shown in Figure 2. It shows that plans with higher star ratings became more prevalent in 2015 compared to 2009 which could suggest that the helath insurance plans have been improving in quality over time.

1.3 Question 3

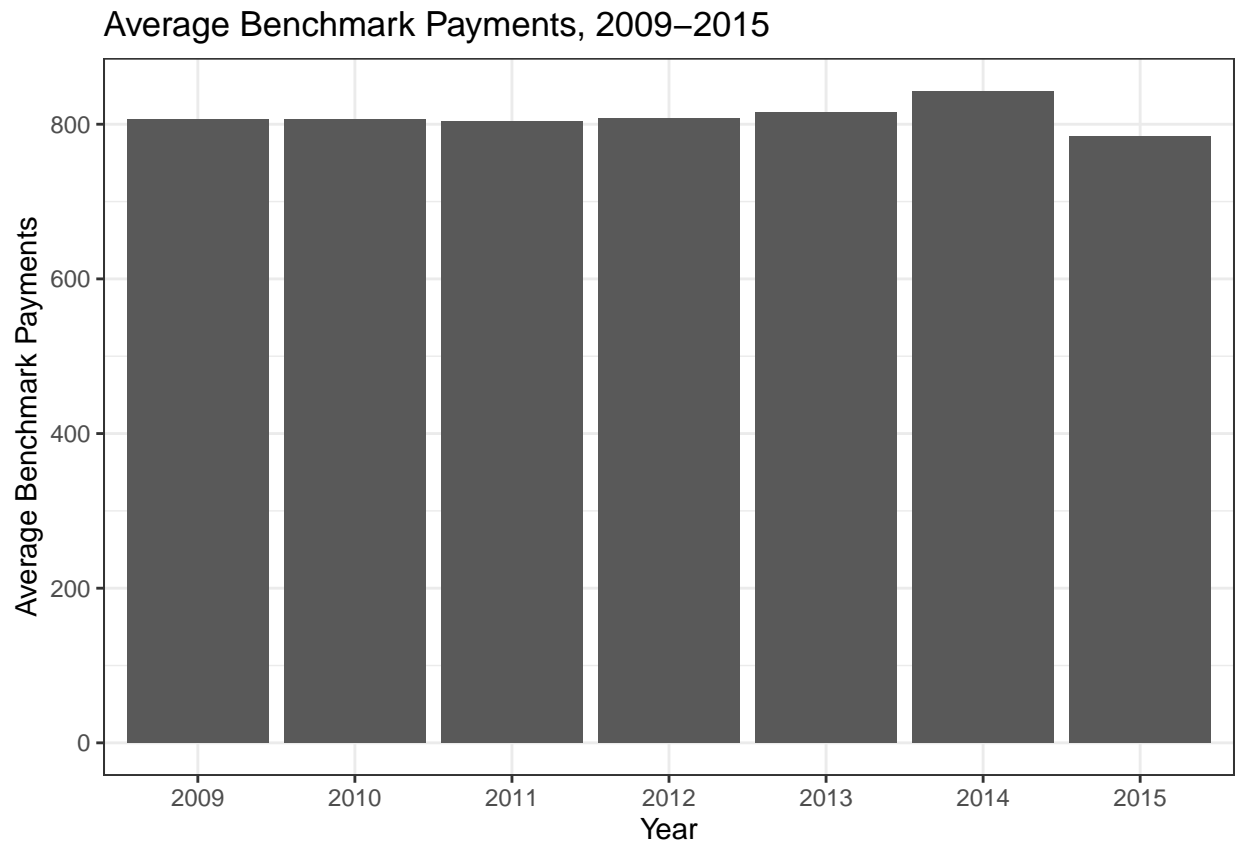### Average Benchmark Payments, 2009–2015

Figure 3: Average Benchmark Payments, 2009-2015

The change in average benchmark payments from 2009 to 2015 is shown in Figure 3 which shows that the average benchmark payment has remained constant at $800 from 2009 till 2012, after which it increased in 2013 and 2014, before falling again in 2015.

1.4 Question 4

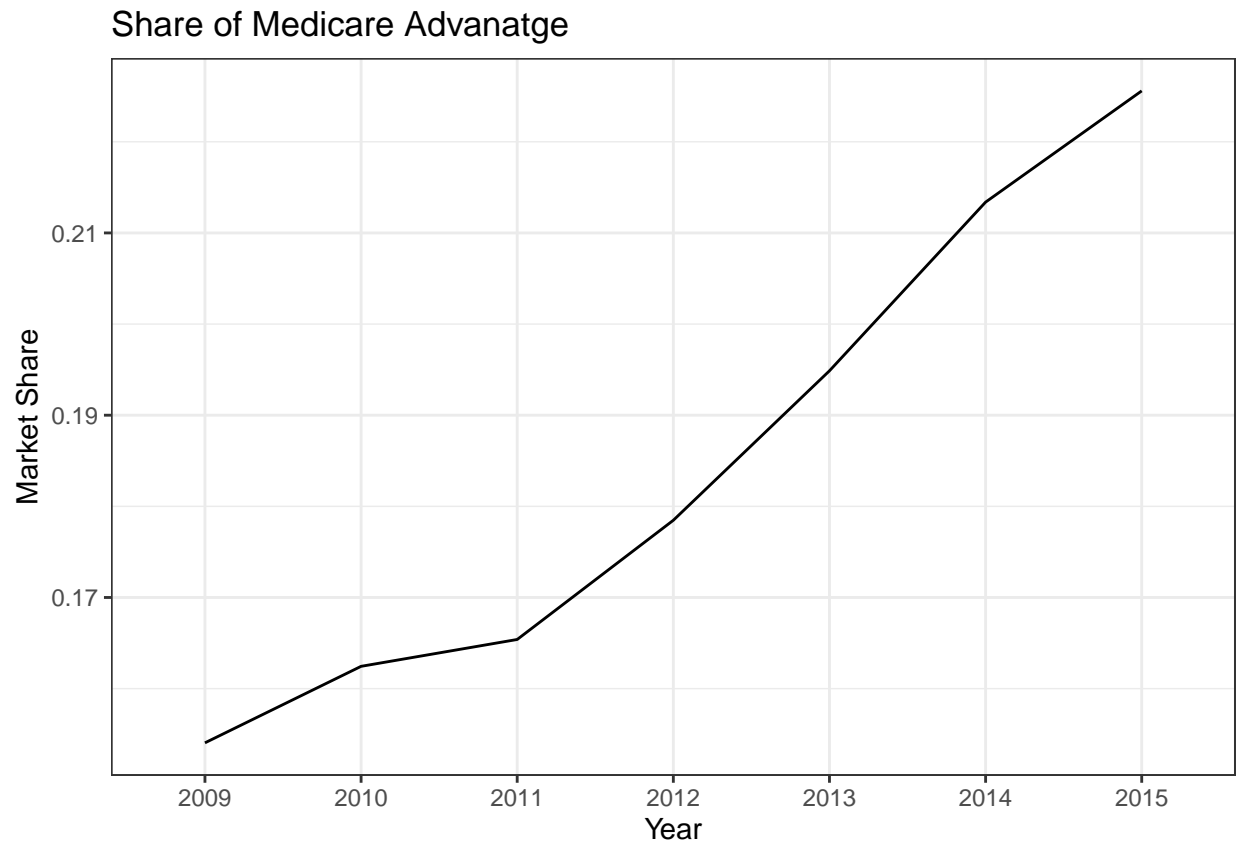Share of Medicare Advanatge

Figure 4: Share of Medicare Advanatge, 2009-2015

As shown in Figure 4, the average share of Medicare Advantage has increased significantly from 2009 to 2015, indicating an increase in its popularity over time. As the benchmark payments have remained more or less constant during this time period, it suggests that more people preferred Medicare Advantage compared to other options probably due to factors such as better quality or coverage.

2 Estimate ATE

2.1 Question 1

Table 1: Number of Plans

Star Rating	Average Indicator
1.5	0.0046332
2.0	0.1211818
2.5	0.3783596
3.0	0.7211553
3.5	0.7762617
4.0	0.9263051
4.5	0.9916148
5.0	1.0000000

2.2 Question 2

Table 2: Estimate of Star Rating Effect

Star Rating	Estimate
2.5 vs 3	0.0041783
3.5 vs 4	0.0031320
4 vs 4.5	-0.0022693

2.3   Question 3

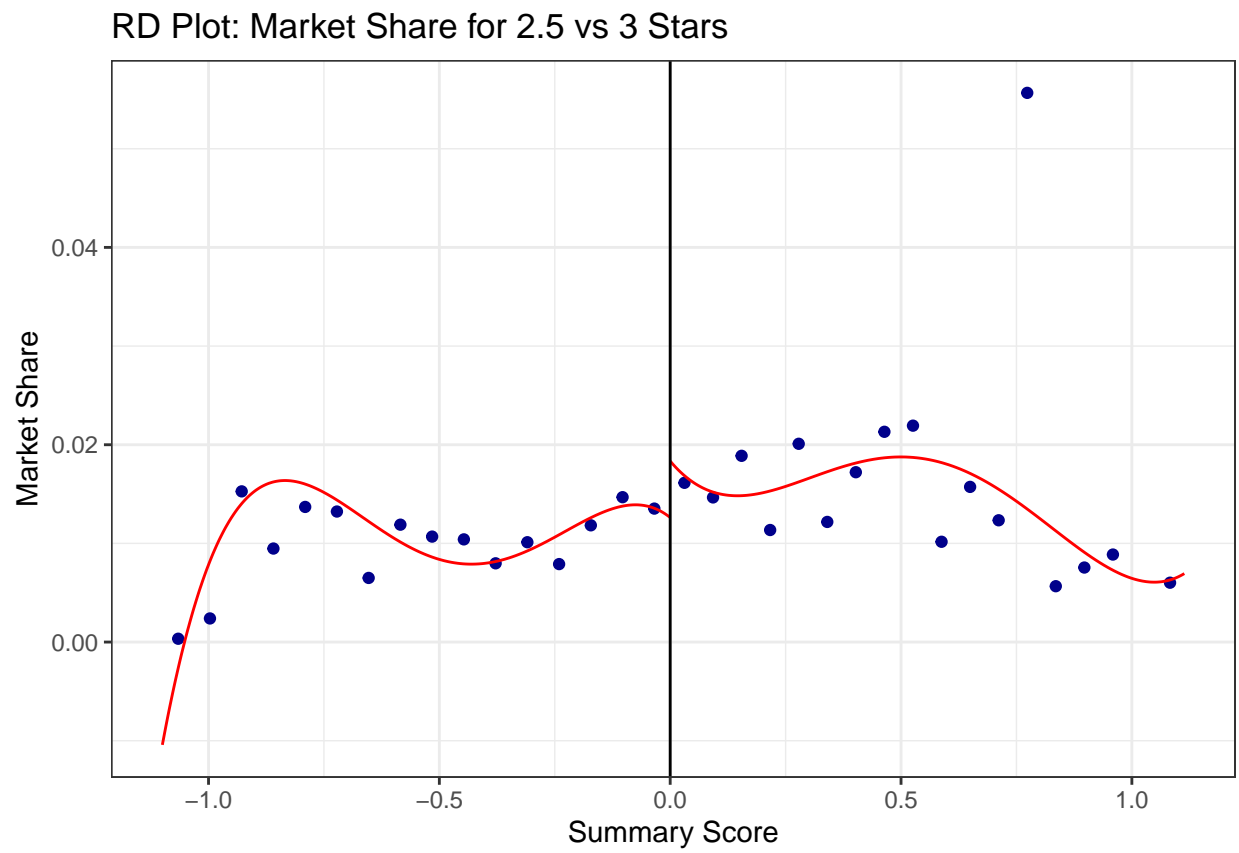RD Plot: Market Share for 2.5 vs 3 Stars

Figure 5: Estimate of Star Rating Effects, 2.5 vs 3 Stars

The graphs looks wrong as the range is incorrect but I am unable to fix the error
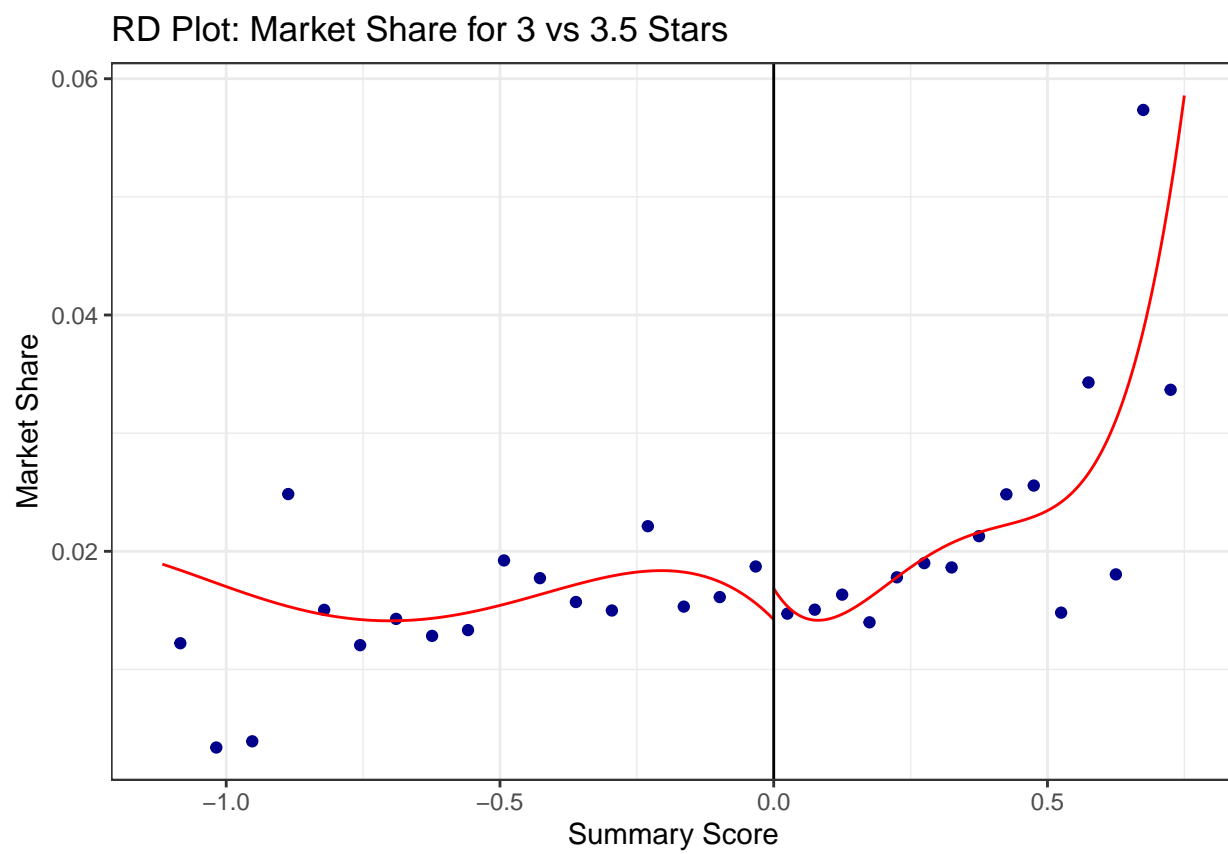
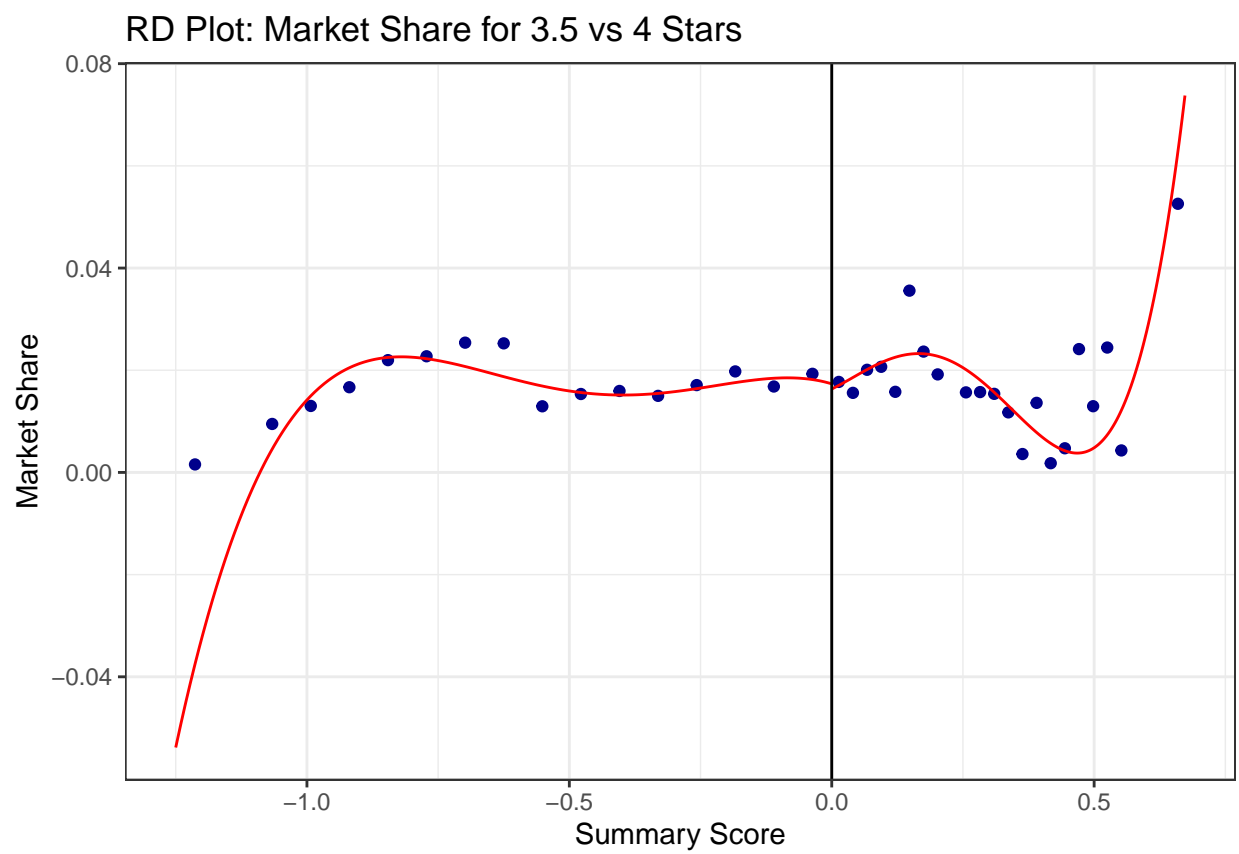Figure 6: Estimate of Star Rating Effects, 3 vs 3.5 Stars

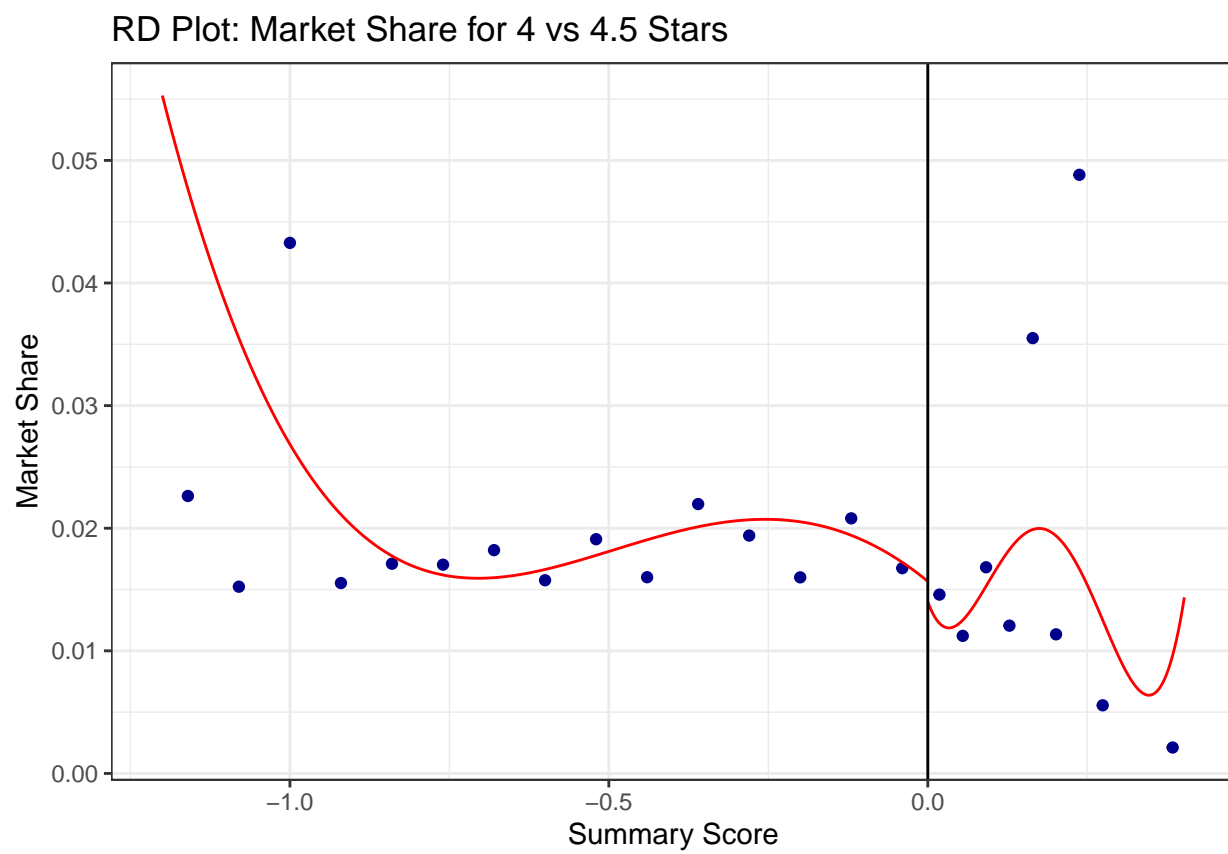Figure 7: Estimate of Star Rating Effects, 3.5 vs 4 Stars

Figure 8: Estimate of Star Rating Effects, 4 vs 4.5 Stars

2.4 Question 4

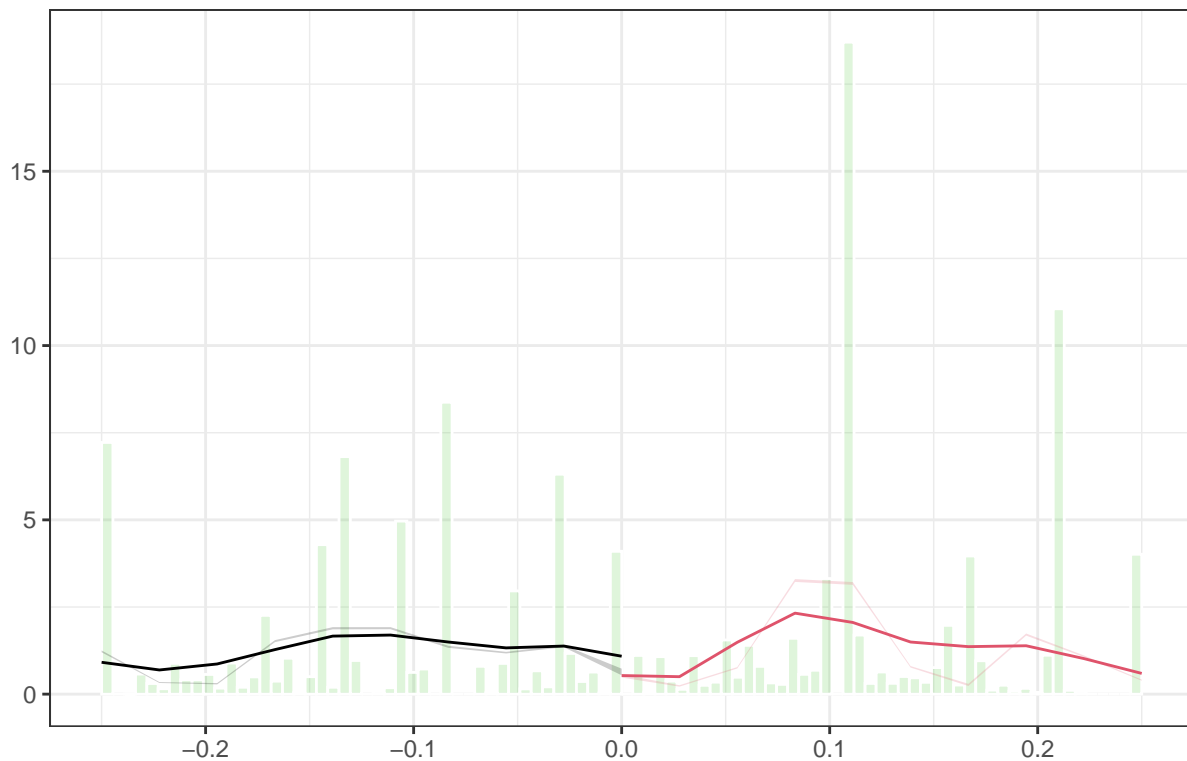Figure 9: Manipulation of Running Variable, 2.5 vs 3 Stars

```
## $Estl
## Call: lpdensity
##
## Sample size                                  67761
## Polynomial order for point estimation   (p=) 2
## Order of derivative estimated           (v=) 1
## Polynomial order for confidence interval (q=) 3
## Kernel function                              triangular
## Scaling factor                               0.542770403953829
## Bandwidth method                             user provided
##
## Use summary(...) to show estimates.
##
## $Estr
## Call: lpdensity
##
## Sample size                                  59861
## Polynomial order for point estimation   (p=) 2
## Order of derivative estimated           (v=) 1
## Polynomial order for confidence interval (q=) 3
## Kernel function                              triangular
## Scaling factor                               0.479489911167004
## Bandwidth method                             user provided
##
## Use summary(...) to show estimates.
##
```
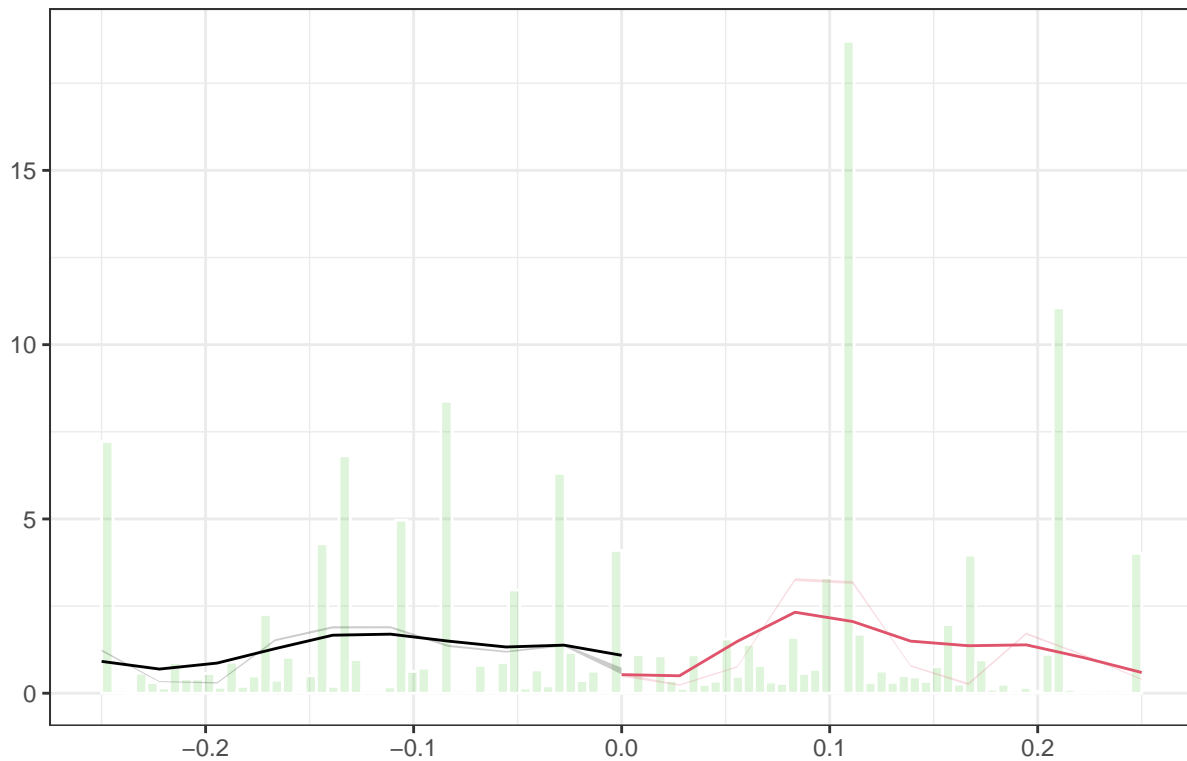
$Estplot

Figure 10: Manipulation of Running Variable, 2.5 vs 3 Stars

```
## $Estl
## Call: lpdensity
##
## Sample size                                81967
## Polynomial order for point estimation   (p=)  2
## Order of derivative estimated           (v=)  1
## Polynomial order for confidence interval (q=)  3
## Kernel function                            triangular
## Scaling factor                             0.619818212065758
## Bandwidth method                           user provided
##
## Use summary(...) to show estimates.
##
## $Estr
## Call: lpdensity
##
## Sample size                                52083
## Polynomial order for point estimation   (p=)  2
## Order of derivative estimated           (v=)  1
## Polynomial order for confidence interval (q=)  3
## Kernel function                            triangular
## Scaling factor                             0.393838568684684
## Bandwidth method                           user provided
##
## Use summary(...) to show estimates.
##
```
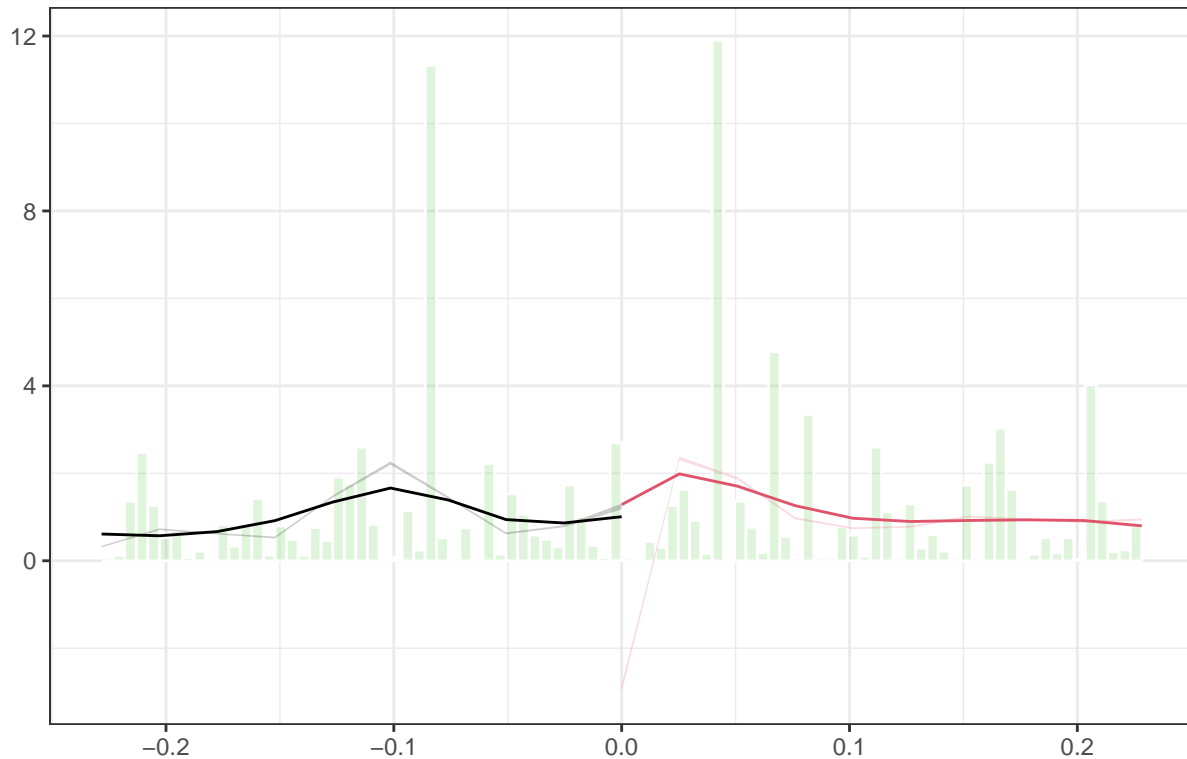
Figure 11: Manipulation of Running Variable, 3 vs 3.5 Stars

```
## $Estplot

## $Estl
## Call: lpdensity
##
## Sample size                                97498
## Polynomial order for point estimation    (p=)  2
## Order of derivative estimated            (v=)  1
## Polynomial order for confidence interval (q=)  3
## Kernel function                                triangular
## Scaling factor                                 0.819302521008403
## Bandwidth method                               user provided
##
## Use summary(...) to show estimates.
##
## $Estr
## Call: lpdensity
##
## Sample size                                24951
## Polynomial order for point estimation    (p=)  2
## Order of derivative estimated            (v=)  1
## Polynomial order for confidence interval (q=)  3
## Kernel function                                triangular
## Scaling factor                                 0.209663865546218
## Bandwidth method                               user provided
##
## Use summary(...) to show estimates.
```
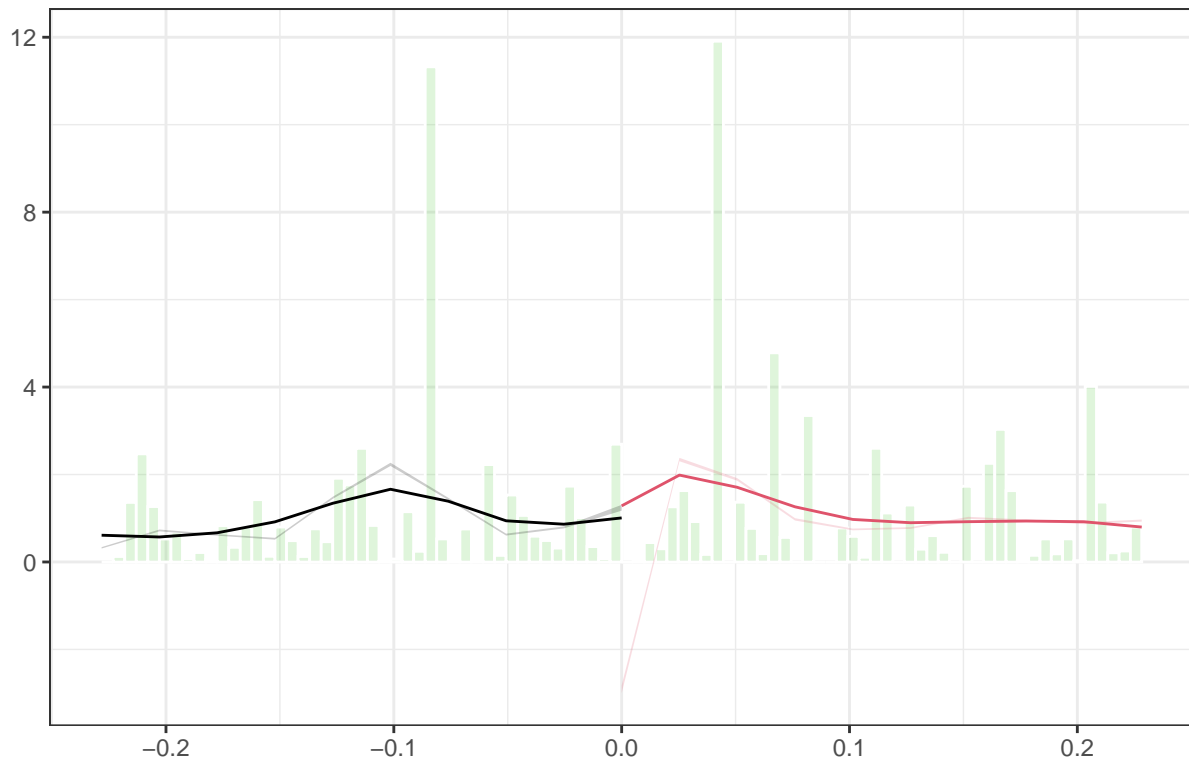
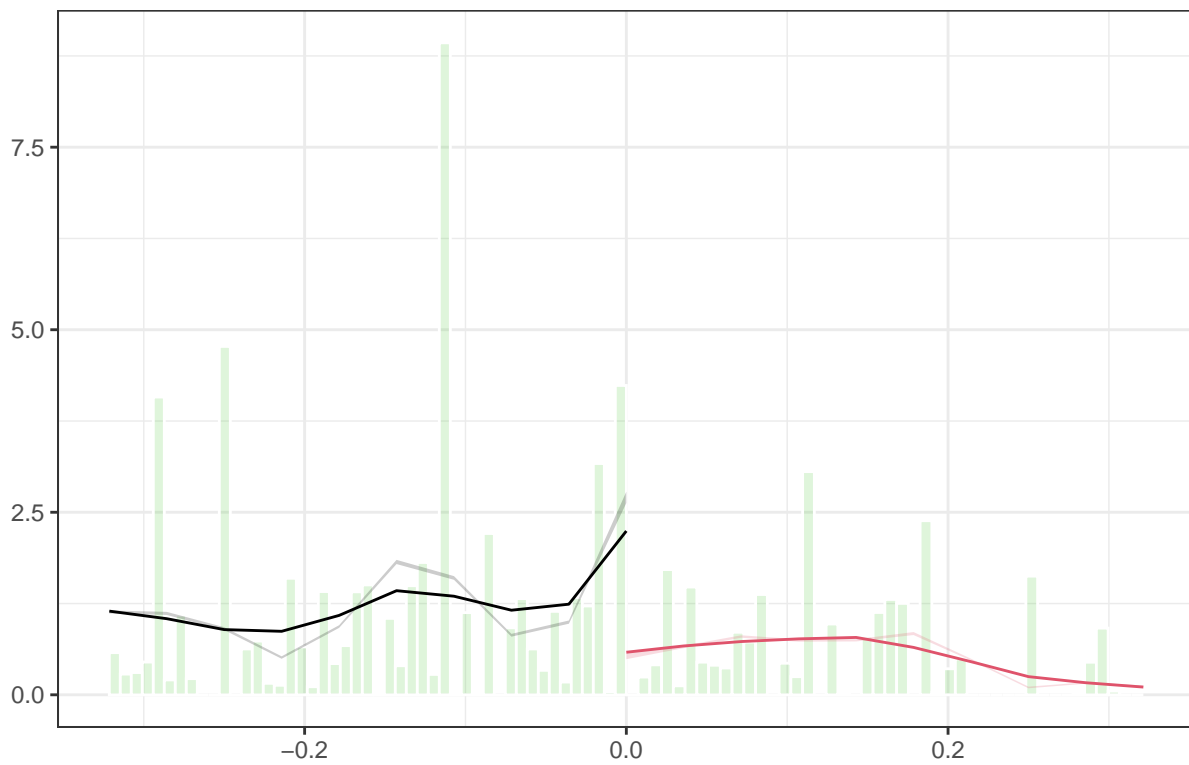Figure 12: Manipulation of Running Variable, 3 vs 3.5 Stars

Figure 13: Manipulation of Running Variable, 3.5 vs 4 Stars
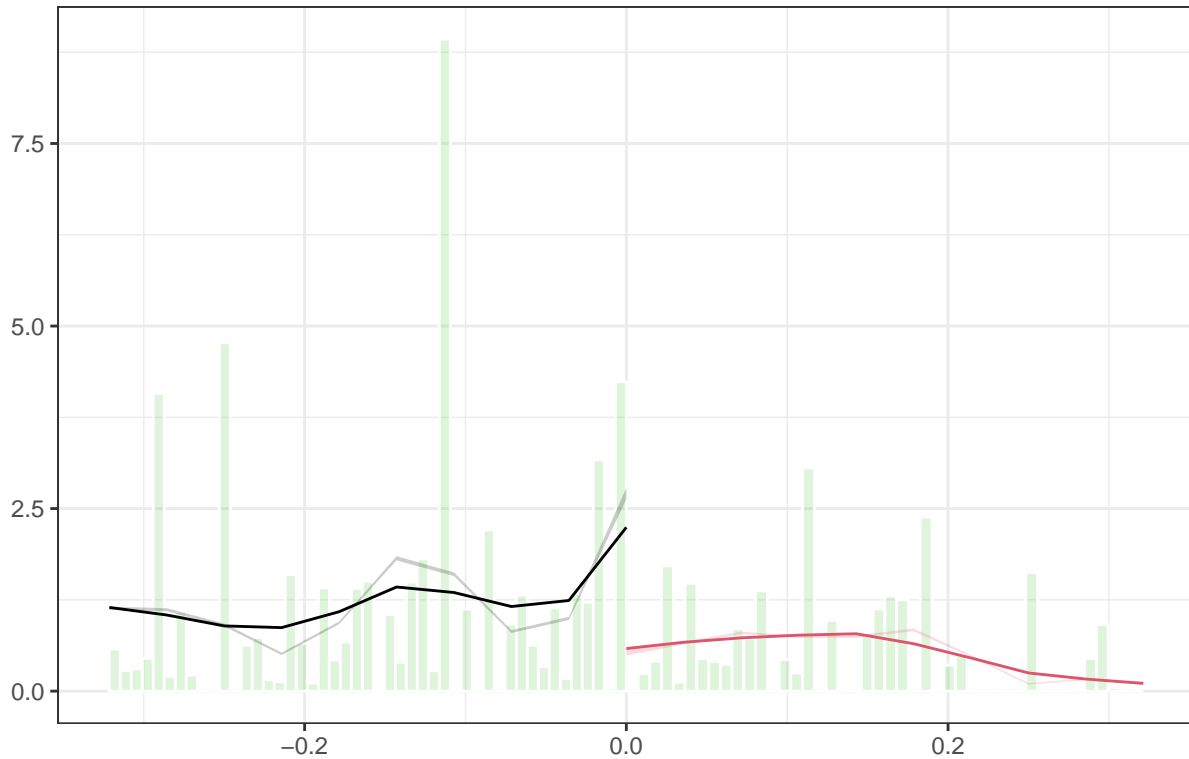
```
##
## $Estplot
```


Figure 14: Manipulation of Running Variable, 3.5 vs 4 Stars

```
## $Estl
## Call: lpdensity
##
## Sample size                                       90173
## Polynomial order for point estimation    (p=)     2
## Order of derivative estimated            (v=)     1
## Polynomial order for confidence interval (q=)     3
## Kernel function                                   triangular
## Scaling factor                                    0.948220745352065
## Bandwidth method                                  user provided
##
## Use summary(...) to show estimates.
##
## $Estr
## Call: lpdensity
##
## Sample size                                       7322
## Polynomial order for point estimation    (p=)     2
## Order of derivative estimated            (v=)     1
## Polynomial order for confidence interval (q=)     3
## Kernel function                                   triangular
## Scaling factor                                    0.0769853621603432
## Bandwidth method                                  user provided
##
## Use summary(...) to show estimates.
```
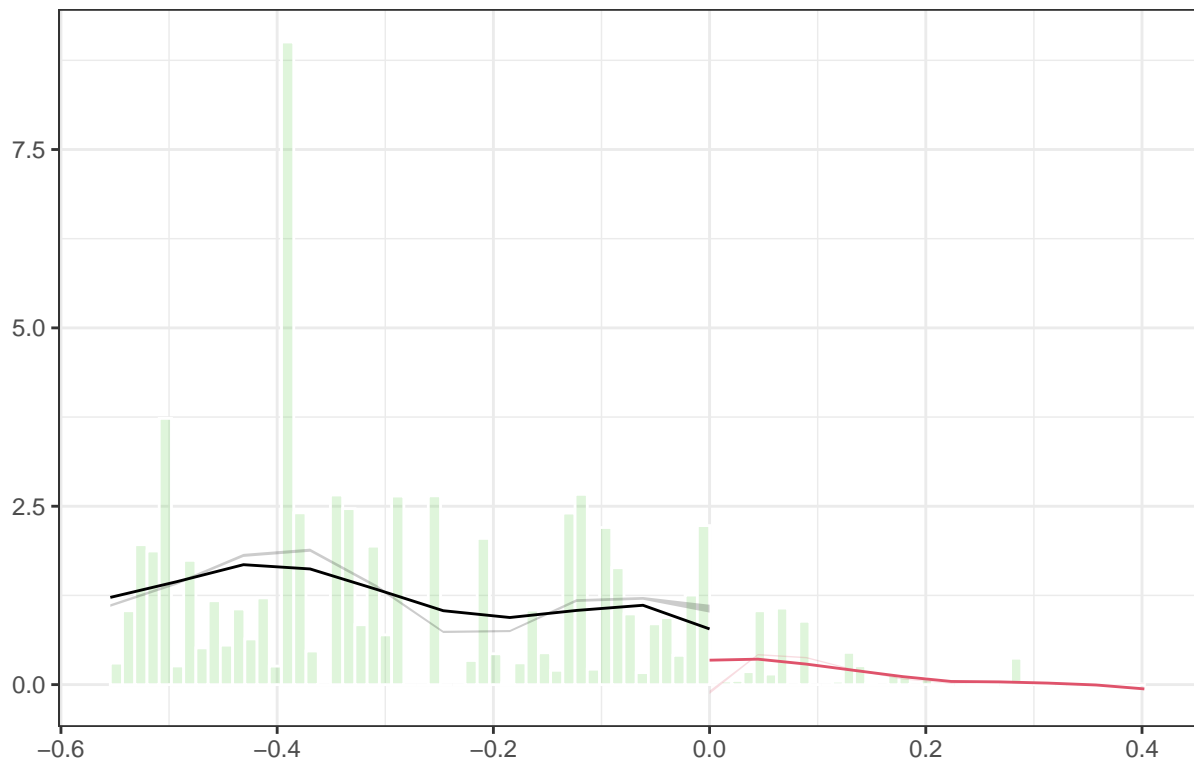
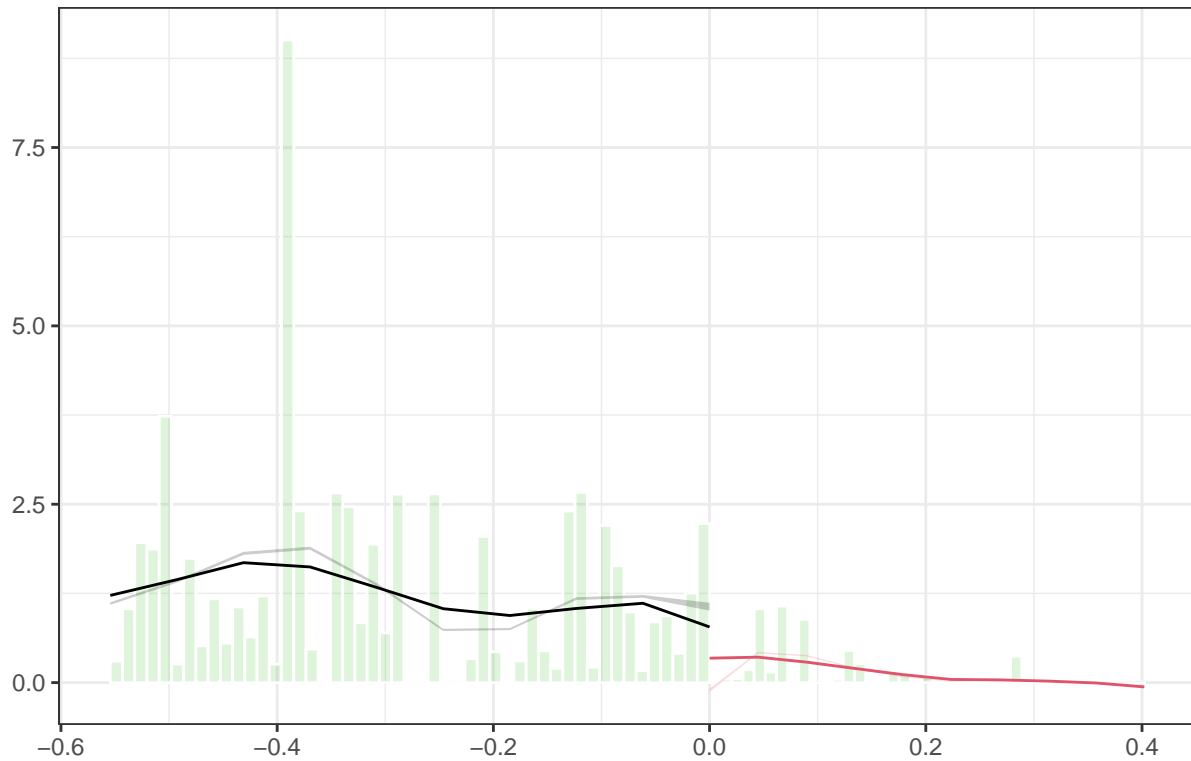Figure 15: Manipulation of Running Variable, 4 vs 4.5 Stars

```
## 
## $Estplot
```

Figure 16: Manipulation of Running Variable, 4 vs 4.5 Stars

2.5 Question 5

Not sure how to check for manipulation of running variable with specific plan characteristic. Should I filter for the plan types and then use the new dataset?

2.6 Question 6

I have incomplete or incorrect answers for some of the questions so I am unable to answer this properly