Homework 4

ECON 470, Spring 2025

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Here is a link to my repository: {https://github.com/mollyjc02/Homework_4.git}

1. Remove all SNPs, 800-series plans, and prescription drug only plans (i.e., plans that do not offer Part C benefits). Provide a box and whisker plot showing the distribution of plan counts by county over time. Do you think that the number of plans is sufficient, too few, or too many?

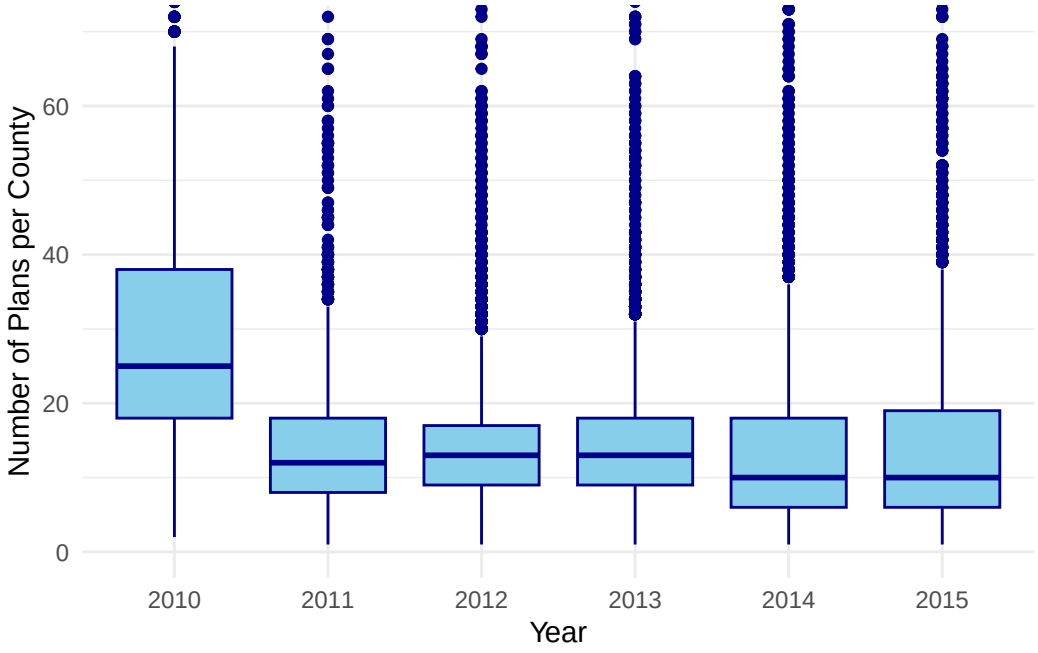

Figure 1: Distribution of Plan Counts by County Over Time

2. Provide bar graphs showing the distribution of star ratings in 2010, 2012, and 2015. How has this distribution changed over time?

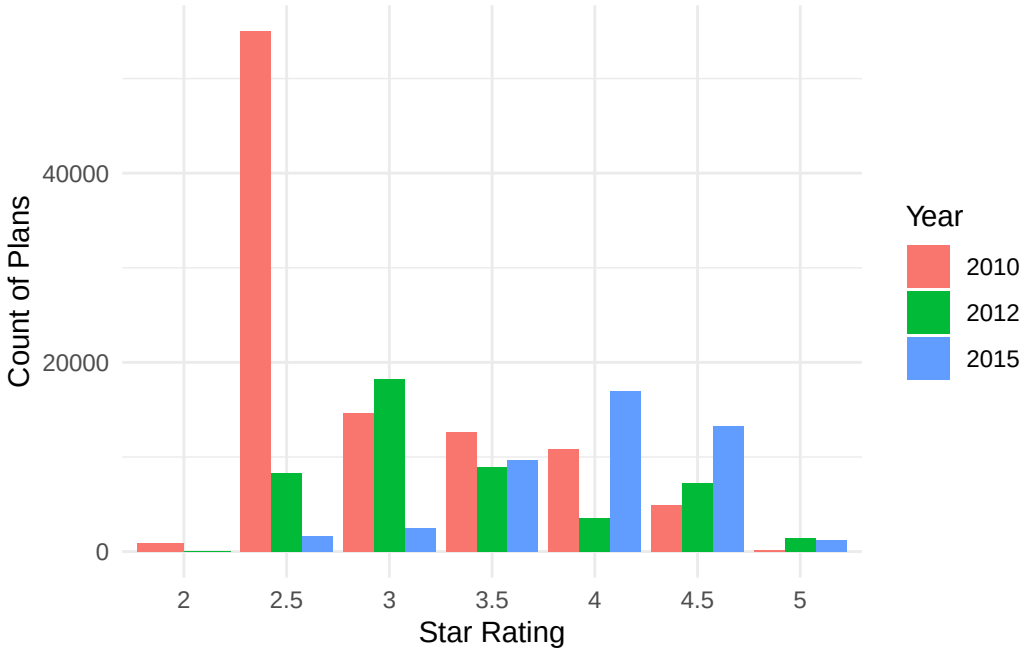

Figure 2: Distribution of Star Ratings by Year

3. Plot the average benchmark payment over time from 2010 through 2015. How much has the average benchmark payment risen over the years?

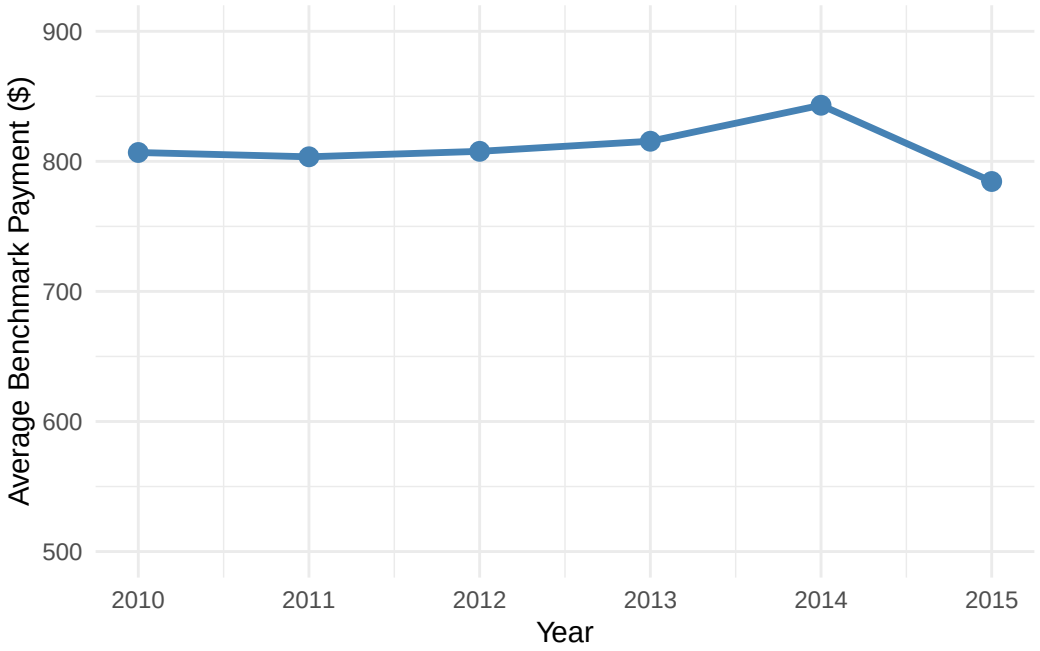

Figure 3: Average Benchmark Payment for MA Plans (2010–2015)

4. Plot the average share of Medicare Advantage (relative to all Medicare eligibles) over time from 2010 through 2015. Has Medicare Advantage increased or decreased in popularity? How does this share correlate with benchmark payments?

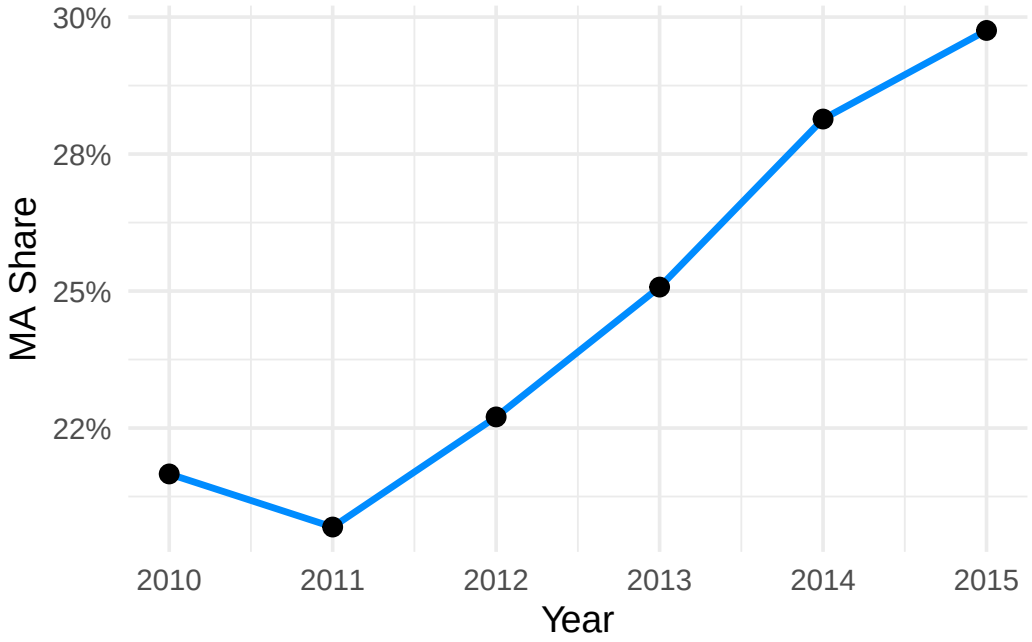

Figure 4: Average Medicare Advantage Share of Medicare Eligibles (2010–2015)

The following questions are utilizing data from 2010 only.

5. Calculate the running variable underlying the star rating. Provide a table showing the number of plans that are rounded up into a 3-star, 3.5-star, 4-star, 4.5-star, and 5-star rating.

Table 1: Number of ratings that were rounded up

Star_Rating	rounded_up
3.0	1304
3.5	1547
4.0	1399
4.5	176
5.0	26

Figure 5: Number of Plans by Rounded Star Rating

6. Using the RD estimator with a bandwidth of 0.125, provide an estimate of the effect of receiving a 3-star versus a 2.5 star rating on enrollments. Repeat the exercise to estimate the effects at 3.5 stars, and summarize your results in a table.

```
Warning: package 'broom' was built under R version 4.4.3
```

```
# A tibble: 3 x 5
  term        Estimate_3     SE_3 Estimate_3.5  SE_3.5
  <chr>            <dbl>    <dbl>        <dbl>   <dbl>
1 (Intercept)    0.00878 0.000602      0.0167  0.00165
2 treatTRUE      0.00918 0.00128      -0.00263 0.00275
3 score         -0.0216  0.00737       0.0219  0.0164
```

7. Repeat your results for bandwidhts of 0.1, 0.12, 0.13, 0.14, and 0.15 (again for 3 and 3.5 stars). Show all of the results in a graph. How sensitive are your findings to the choice of bandwidth?

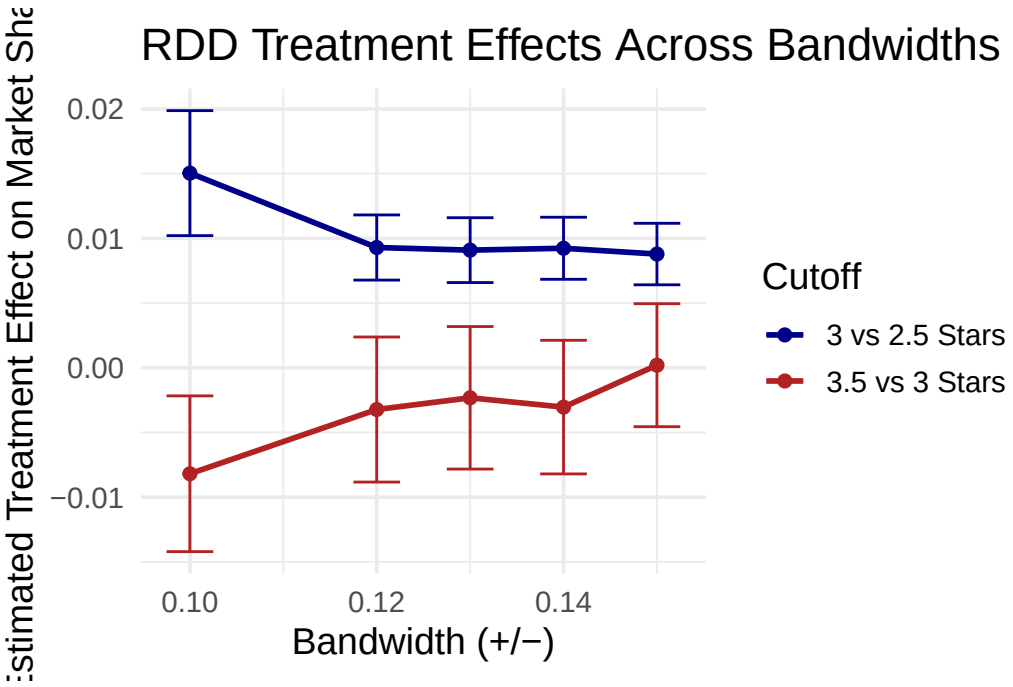

Figure 6: RDD Results Across Bandwidths

8. Examine (graphically) whether contracts appear to manipulate the running variable. In other words, look at the distribution of the running variable before and after the relevent threshold values. What do you find?

```
Attaching package: 'gridExtra'

The following object is masked from 'package:dplyr':

    combine
```

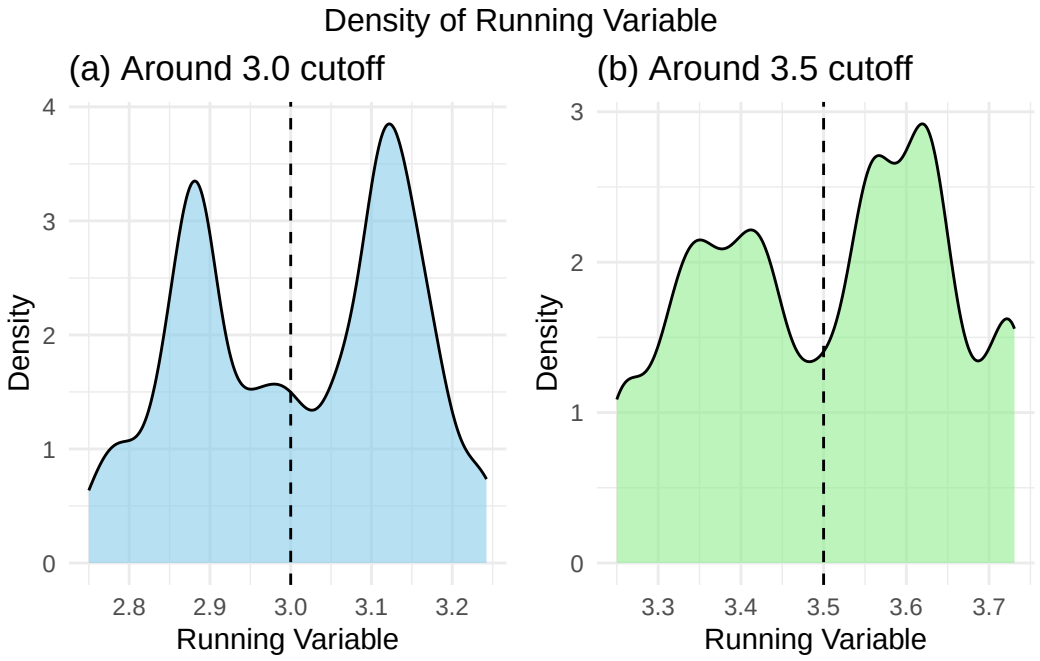

Figure 7: Variable Distribution

9. Similar to question 4, examine whether plans just above the threshold values have different characteristics than contracts just below the threshold values. Use HMO and Part D status as your plan characteristics.

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(`geom_point()`).
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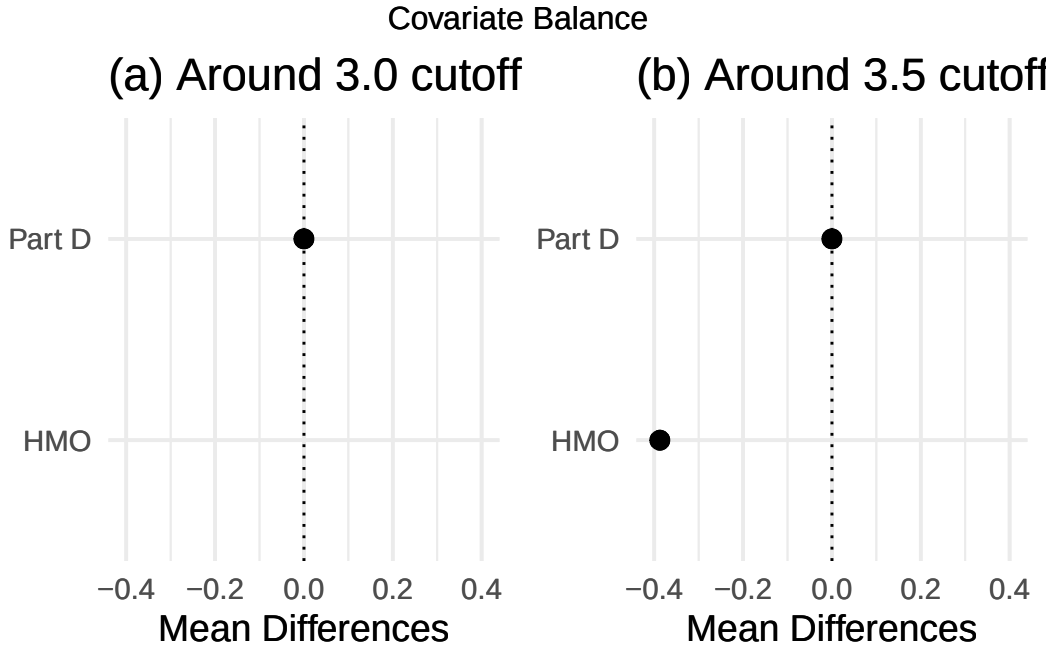

Figure 8: Plan Characteristics