Gov 52 Replication Project

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Introduction:

In the course Gov 52, students have become more exposed and familiarized with statistical modeling, regression analysis, and data collection. In order to further extend my understanding of this material, I have decided to replicate the work done in Jeffrey Harden's and Justin Kirkland's piece "Do Campaign Donors Influence Polarization? Evidence from Public Financing in the American States." On a base level, the piece attempts to answer the age-old question of how money affects US politics and whether or not it is too influential. Specifically, Harden and Kirkland (2016) looks at if the source of campaign funds, that is whether a campaign is funded privately or publicly, influences legislative polarization. They consider the claim that private donors facilitate legislative polarization more than large-scale public donors. This is based on the assumption that individual and privatized donors are more ideologically extreme than the public as a whole. In order to study this, Harden and Kirkland use linear regressions and synthetic case studies to study the natural experiment in the New Jersey Assembly.

The replication code and appendix of this paper can be found at the following link: *https://doi.org/10.7910/DVN/28868*

Literature Review:

The topic of campaign finance and control has been one heavily discussed by both the general public and political figures. The Supreme Court has heavily weighted in on the topic, first with the landmark case *Buckley v. Valeo*, where it was ruled that limitations on certain types of election spending is unconstitutional and money itself constitutes as protected speech under the First Amendment. More recently in the 2010 case of *Citizens United v. Federal Election Commission*, the Court decided that the free speech clause in the First Amendment prohibits the United States government from restricting independent expenditures by corporations. By making donations a form of legitimate political participation, the Supreme Court furthered people's concerns about money in politics. Many studies have been conducted on this relationship between money and politics. Gilens (2012) discusses the idea of democracy, and how such a system can be achieved if a nation gives most political advantage to the richest members. Meanwhile, Scholzman, Verba, and Brady (2012) looked at representation within political participation, suggesting that the affluent and educated play the biggest role, potentially leading to political inequality. Furthermore, Hamm and Hogan (2008) look at financing politics through a different lens, finding that low contributions to a legislative campaign pave the way for a challenger to face the incumbent. Finally, Stratmann and Aparicio-Castillo (2006) suggest that restrictions on campaign financing can lead to closer margins of victory in state legislative elections. We see with all these studies that the stakes in studying finance in politics as a form of political action and participation are extremely high, as landmark cases have been decided on this topic, and scholars continuously debate the influence of the action heavily.

New Jersey Assembly Natural Experiment:

As aforementioned, Harden and Kirkland (2016) use a natural experiment found within the New Jersey Assembly to conduct their study. Specifically, the study looks at the *New Jersey Fair and Clean Elections Pilot Project*, as the program set forth public financing in the years 2005 and 2007 for some legislative

Assembly members. The short experiment, which was not again renewed in 2009, allowed the authors to compare the voting behaviors of the New Jersey legislators that were publicly funded and those who were not. Similar comparisons were done with legislators in the states of Arizona and Maine, before and after the implementation of public financing. While New Jersey implemented a pilot program which introduced public financing, Arizona's and Maine's were on a state-wide scale. The laws were passed in 1998 and 1996 respectively in order to curb corruption.

Hypotheses:

The study sets forth many theoretical expectations and hypotheses regarding the question of campaign financing and legislative polarization. I will list a the hypotheses made in this study:

- Moderating Hypothesis: "(a) Committee Voting: Public financing of legislative elections reduces the ideological extremity of individual legislators' voting behavior in committees." "(b) Floor Voting: Public financing of legislative elections reduces the ideological extremity of individual legislators' roll-call behavior on the floor of the chamber."
- The Flanking Hypothesis: "(a) Committee Voting: Public financing of legislative elections increases the ideological extremity of individual legislators' voting behavior in committees." "(b) Floor Voting: Public financing of legislative elections increases the ideological extremity of individual legislators' roll-call behavior on the floor of the chamber."
- The Strategic Donor Hypothesis: "(a) Committee Voting: Public financing of legislative elections reduces the ideological extremity of individual legislators' voting behavior in committees." "(b) Floor Voting: Public financing of legislative elections exerts no effect on the ideological extremity of individual legislators' roll-call behavior on the floor of the chamber."
- No-Strings-Attached Hypothesis: "(a) Committee Voting: Public financing of legislative elections exerts no effect on the ideological extremity of individual legislators' voting behavior in committees." "(b) Floor Voting: Public financing of legislative elections exerts no effect on the ideological extremity of individual legislators' roll-call behavior on the floor of the chamber."

Methodology:

As previously mentioned, the study primarily focuses on synthetic case studies to create counterfactuals in order to depict what happened in the states of New Jersey, Arizona, and Maine during events of both public and private financing. Limitations to this data exist, particularly the New Jersey curated information, as the data set is small. The objective of the study is to test the theories mentioned above to estimate the causal effect of public financing on the legislative voting and polarization. Synthetic case control helps accomplish this, as it creates a mock "second version" of the event we are studying but using controlled cases and variables only. This method of modeling is also ideal for smaller data sample sets, such as the New Jersey example provides.

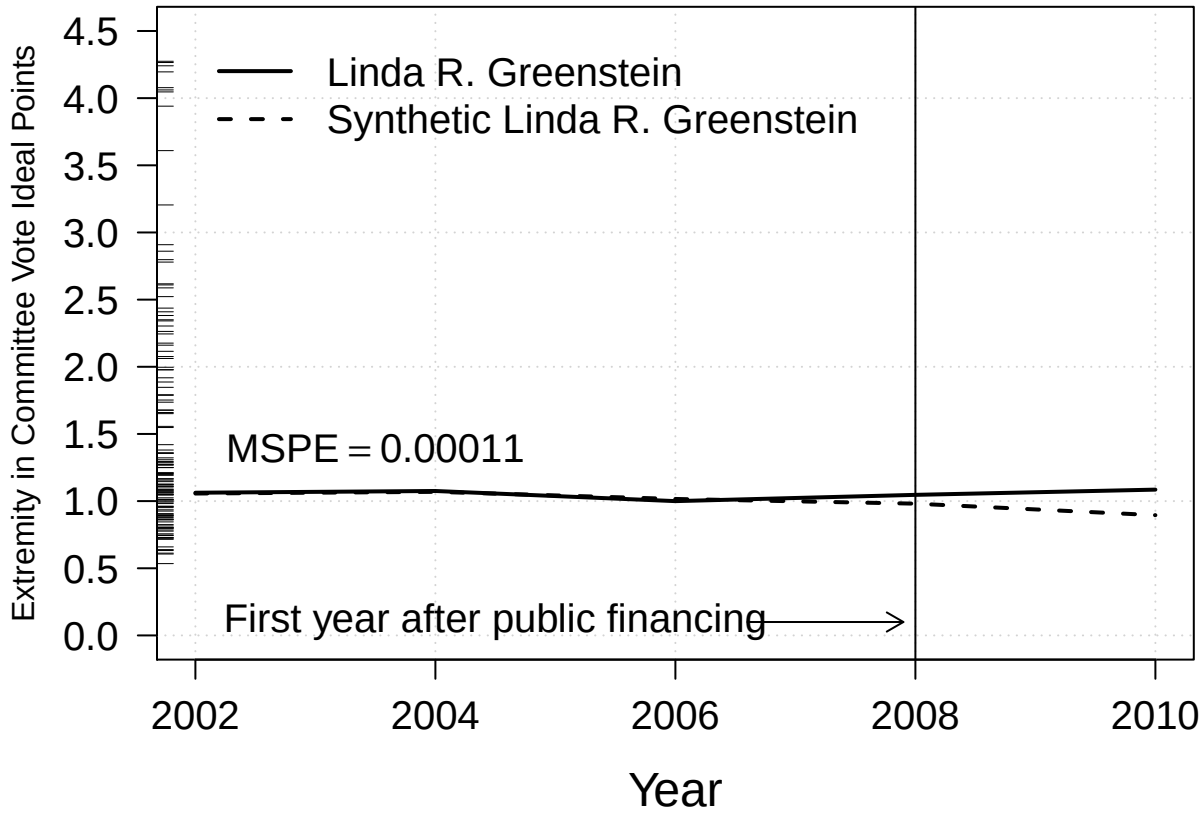
In order to create the models, roll-call data was utilized from the New Jersey Legislative Assembly. Polarization, the variable of interest, is measured by applying Martin Quinn Scores to the legislative votes. Below, we can see how synthetic case structures were developed and graphed (the names correspond to specific assemblymen):

Please Note! The solid lines in the graphs present the extremity of each legislators ideal points and the dashed lines present synthetic case predictions before and after taking public financing.

Assembly Member 1

```
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ***************
```

```
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.0001108379
##
## solution.v:
##  0.01892269 0.101298 0.2698634 0.284865 0.1247639 0.04576042 0.004305449 0.1086935 0.04152774
##
## solution.w:
##  6.33e-08 0.7433039 2.13e-08 3.05e-08 1.882e-07 0.07221879 9.9e-09 6.21e-08 1.17e-08 0.08551863 4.06
```

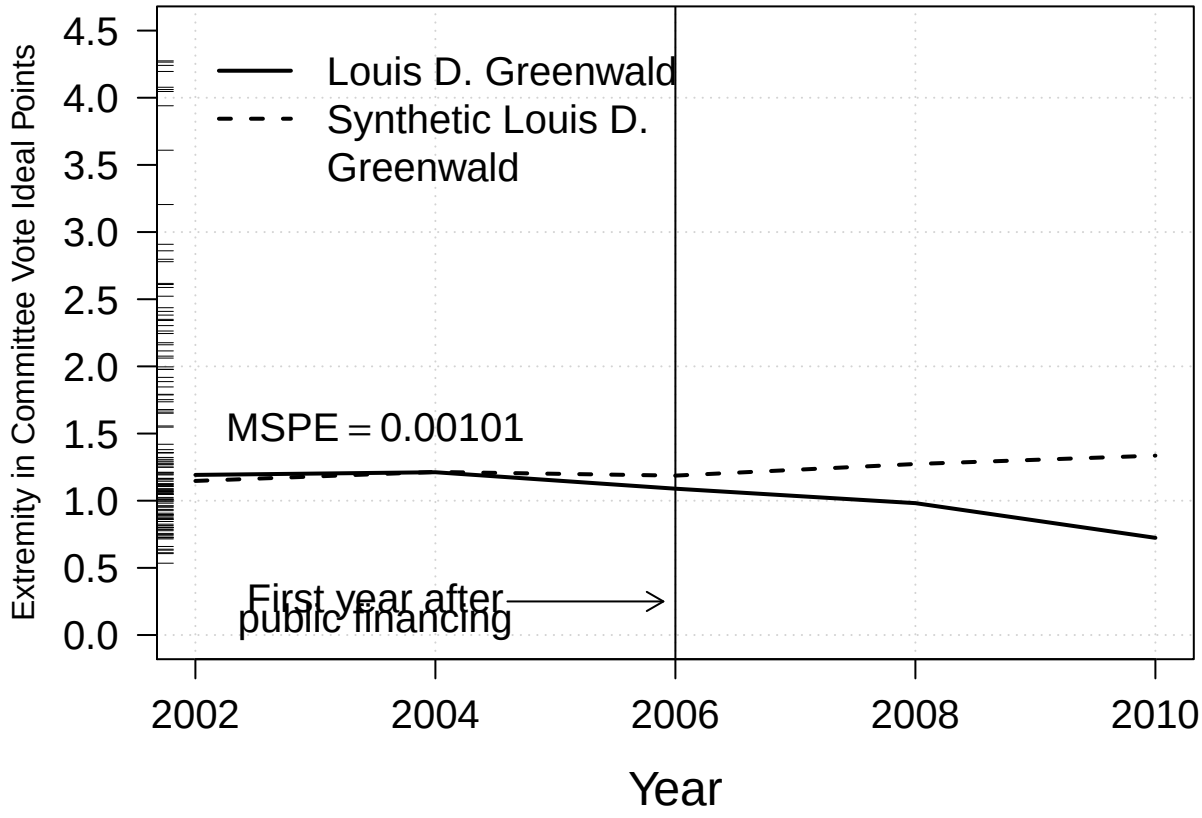



```
## null device
##           1
```

Assembly Member 2

```
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
```

```
## ****************
##
## MSPE (LOSS V): 0.001008089
##
## solution.v:
##  0.2777015 0.04552174 0.0005172896 0.1337928 0.08666654 0.2331483 0.01634186 0.007974914 0.1983351
##
## solution.w:
##  5.5583e-06 0.03630462 2.9325e-06 7.3255e-06 0.0006583147 0.4329731 4.2104e-06 2.4747e-06 3.8533e-06
```

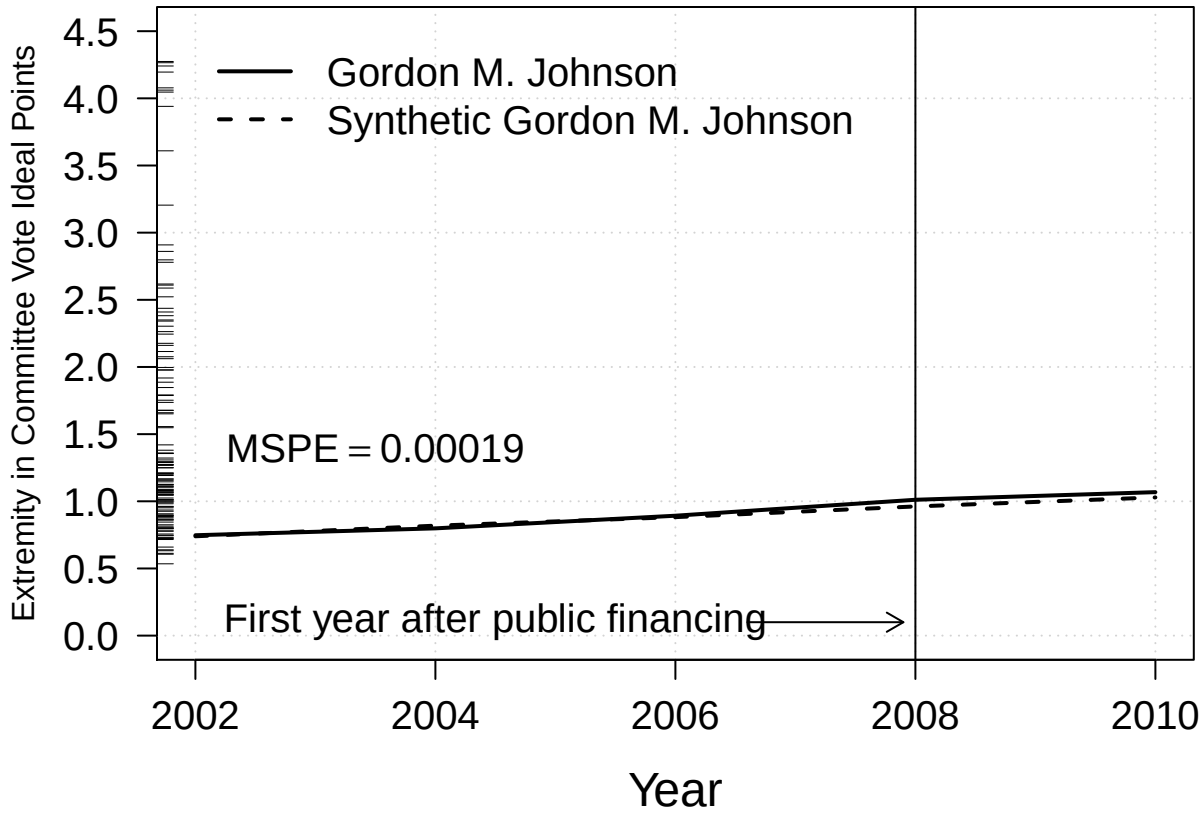



```
## null device
##           1
```

Assembly Member 3

```
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.0001911718
##
## solution.v:
```

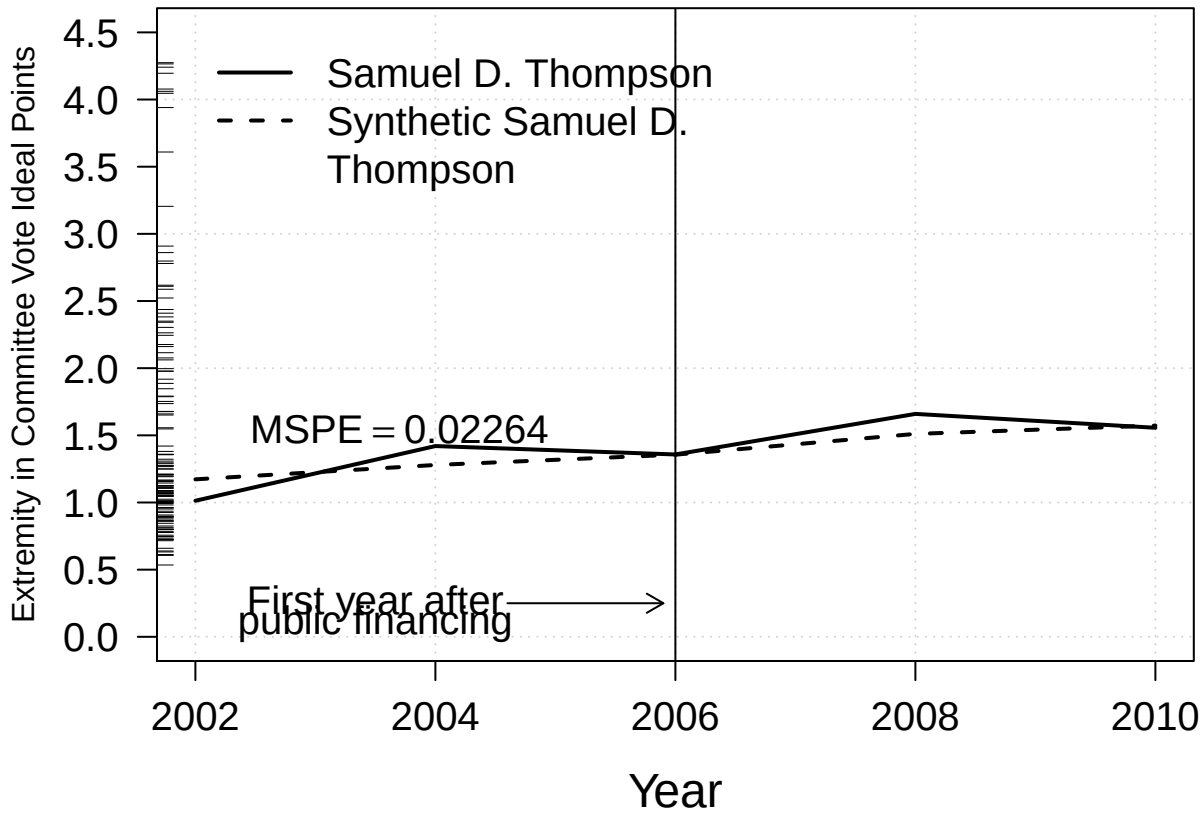
```
##  0.2522593 0.01366109 0.001134567 0.01203919 0.002549267 0.00235333 0.004817062 0.7008955 0.01029073
##
## solution.w:
##  0.0002110114 1.05e-08 0.0001821343 1.808e-07 0.009476939 5.7081e-06 0.001988793 4.60134e-05 0.16892
```




```
## null device
##           1
```

Assembly Member 4

```
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.02263625
##
## solution.v:
##  1.51296e-05 0.2551147 0.006758776 3.51084e-05 0.6034115 0.03936089 0.005552987 0.08869587 0.001055
##
## solution.w:
##  0.01706103 3.27694e-05 5.663e-07 3.136e-07 1.0129e-06 3.703e-07 5.71e-08 4.51e-07 3.347e-07 3.4694e
```




```
## null device
##           1
```

Be warned! This will take a longer time to run, as we are filling in the gaps

of many synthetic case tests in order to see the differentiation of ideal points.

```
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.01536259
##
## solution.v:
##  0.5510219 0.01834574 0.01434553 0.03234824 0.0117307 0.0005569625 0.3716075 4.34153e-05
##
## solution.w:
##  1.36448e-05 0.6507814 1.20105e-05 1.29268e-05 1.5016e-05 0.06405937 1.94242e-05 1.2569e-05 1.32402e-
```

```
##
## [1] 1
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## *****************
##  searching for synthetic control unit
##
##
## *****************
## *****************
## *****************
##
## MSPE (LOSS V): 0.0004766515
##
## solution.v:
##  0.2909663 0.07605336 0.02329374 0.143739 0.04706195 0.2053729 0.07604328 0.02678445 0.110685
##
## solution.w:
##  2.17273e-05 2.11651e-05 6.938e-07 3.2006e-06 1.6784e-06 0.0001007925 5.46892e-05 0.2930801 0.039500
##
## [1] 2
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## *****************
##  searching for synthetic control unit
##
##
## *****************
## *****************
## *****************
##
## MSPE (LOSS V): 1.535795
##
## solution.v:
##  0.4978867 1.4296e-06 0.08803103 0.0336415 0.0004971569 0.02090348 0.1474438 0.2009183 0.01067657
##
## solution.w:
##  0.6369846 5.803e-07 5.5948e-06 6.0199e-06 0.0007538182 1.7028e-06 6.311e-06 8.779e-07 2.13739e-05 2
##
## [1] 3
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## *****************
##  searching for synthetic control unit
##
##
## *****************
## *****************
```

```
## ****************
##
## MSPE (LOSS V): 0.002467657
##
## solution.v:
##  0.09153037 0.1734443 0.207343 0.142073 0.001729284 0.1381748 0.2345595 0.008884218 0.00226154
##
## solution.w:
##  0.0002076866 6.49e-08 4.894e-07 2.34146e-05 0.05396786 0.08322144 0.2282119 1.073e-07 7.7841e-06 8.8
##
## [1] 4
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.0001534524
##
## solution.v:
##  0.1907256 0.1857908 0.3352251 0.031183 0.006167716 0.06340206 0.001249069 0.1717064 0.0145503
##
## solution.w:
##  2.003e-07 1.52e-08 1.75e-07 6.4705e-06 0.05390605 2.67e-07 1.728e-07 7.88e-08 0.4838374 6.49449e-05
##
## [1] 5
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 4.215854e-06
##
## solution.v:
##  0.1965533 0.01502873 0.03060281 0.0004276863 0.02364993 0.017909 0.01160769 0.6808913 0.02332958
##
## solution.w:
##  0.00766741 2.634e-07 2.35092e-05 0.2435525 4.0552e-06 2.97974e-05 0.4072693 6.763e-07 1.3061e-06 0.0
##
## [1] 6
##
```

```
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.002807019
##
## solution.v:
##  0.2023376 0.1732392 0.001914702 0.3296466 0.01814828 0.07409569 0.1985921 0.001575054 0.0004508362
##
## solution.w:
##  0.001961511 2.321e-06 1.1755e-06 1.92429e-05 1.5682e-06 1.0239e-06 0.2202331 0.1894159 1.5971e-06 9
##
## [1] 7
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 3.705273e-12
##
## solution.v:
##  0.1385298 0.1329919 0.05036419 0.1111452 0.1261813 0.08215348 0.229757 0.109836 0.01904126
##
## solution.w:
##  0.01726671 8.7e-09 2.12652e-05 1.08364e-05 1.03046e-05 0.2785713 0.0003330435 0.5257222 2.28888e-05
##
## [1] 8
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 2.286153e-12
```

```
##
## solution.v:
##  0.07323649 0.1114562 0.1172392 0.1073018 0.1026726 0.148561 0.1095927 0.1205463 0.1093938
##
## solution.w:
##  1.5806e-06 0.2273737 5.351e-07 1.989e-07 3.811e-07 1.012e-07 5.93e-07 0.3395382 2.523e-07 1.28e-08 1
##
## [1] 9
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.04812251
##
## solution.v:
##  0.166854 0.03807676 0.0380823 0.000134073 0.04534505 2.0119e-06 0.05405763 0.6572231 0.0002251059
##
## solution.w:
##  0.0001522741 0.2174824 0.0001724099 2.7824e-05 0.000168743 3.7026e-06 0.000170548 0.01575378 1.2383
##
## [1] 10
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.006355431
##
## solution.v:
##  0.0001528205 0.003449514 4.2162e-05 0.000157784 0.2405395 0.05957193 0.2736556 0.3370837 0.08534702
##
## solution.w:
##  0.0004028707 6.6512e-06 0.0003382746 0.0005999743 0.0006950322 0.1260742 0.0003566129 6.253e-07 0.00
##
## [1] 11
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
```

```
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.07107445
##
## solution.v:
##  8.2488e-06 0.06007701 6.51664e-05 5.6373e-06 0.1219387 0.05902735 0.2619711 0.4969061 7.267e-07
##
## solution.w:
##  0.0003302969 0.0001663742 1.81698e-05 0.0001415544 0.0001462236 0.0001504833 1.82723e-05 0.00014825
##
## [1] 12
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.03456692
##
## solution.v:
##  0.1312359 0.01281595 0.001380284 0.001752388 0.06184236 0.009498496 0.007257423 0.7697987 0.0044184
##
## solution.w:
##  7.491e-07 1.43093e-05 6.541e-07 0.0004201409 6.263e-05 4.363e-07 1.2306e-06 1.994e-07 7.467e-07 8.9
##
## [1] 13
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.0004132233
##
## solution.v:
##  0.170488 0.02832494 0.004860631 0.03867174 0.01233719 0.02783241 0.004817993 0.682608 0.03005904
```

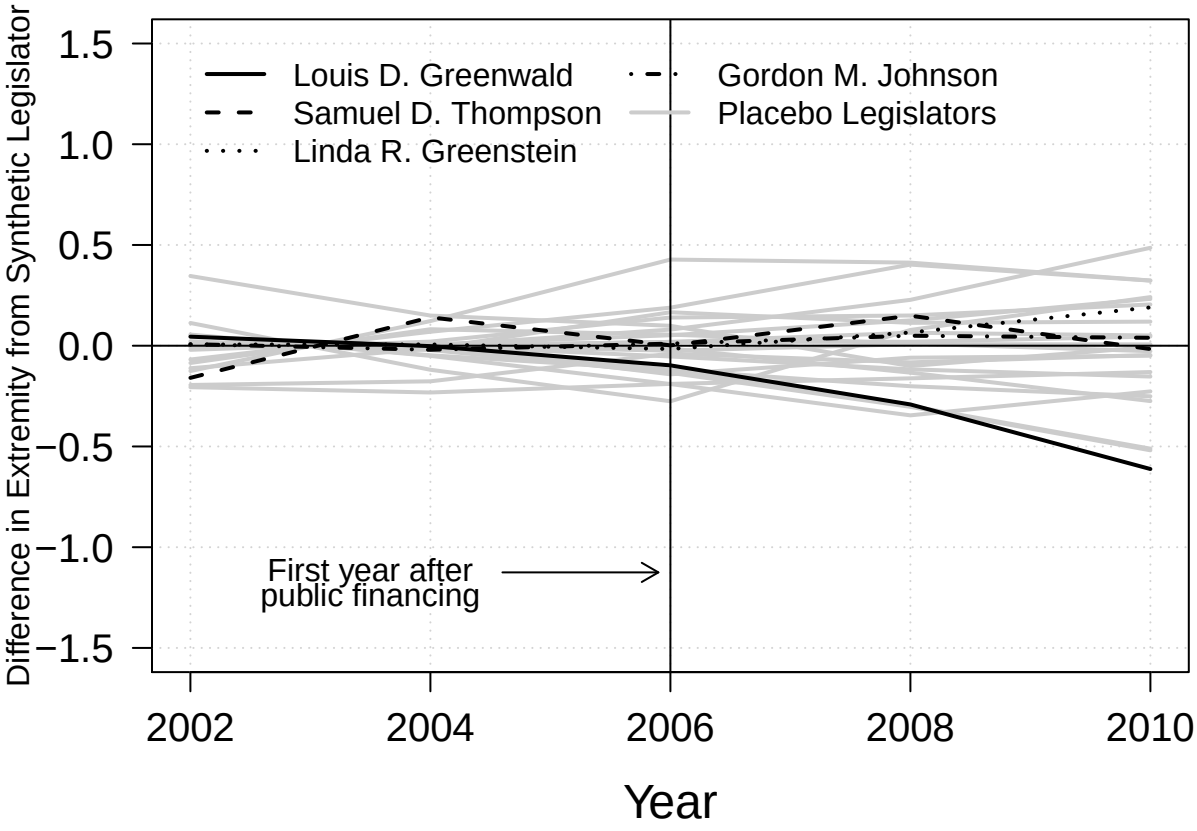
```
##
## solution.w:
##  2.57352e-05 1.1851e-05 5.922e-05 4.2484e-06 3.066e-06 6.391e-07 1.98285e-05 8.484e-07 1.306e-07 5.13
##
## [1] 14
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 4.727998e-16
##
## solution.v:
##  0.1346726 0.0004886293 0.05753277 0.1112111 0.07243989 0.07364331 0.4305056 0.01904904 0.100457
##
## solution.w:
##  2.01856e-05 1.68723e-05 1.40778e-05 2.91458e-05 1.13444e-05 0.0003293753 1.05166e-05 3.20524e-05 4.0
##
## [1] 15
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.00474489
##
## solution.v:
##  0.1894716 4.3559e-06 0.0004519936 0.004207918 0.2686765 0.04217407 0.3098503 0.1359008 0.04926242
##
## solution.w:
##  0.1155271 0.002100755 0.01843586 9.86981e-05 0.000124234 0.0001392721 0.4929286 0.0002252235 7.1382e
##
## [1] 16
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
```

```
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 1.143422e-12
##
## solution.v:
##  0.2142485 0.004691644 0.01276394 0.003543243 0.008304931 0.001231095 0.03428338 0.6979491 0.0229841
##
## solution.w:
##  5.145e-07 5e-10 6.016e-07 0.0004235406 0 0.2557061 1.0484e-06 5.3e-09 3.4e-09 0.5201072 7.82e-08 0.
##
## [1] 17
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 4.07212e-10
##
## solution.v:
##  0.2790863 0.008186824 0.2542262 0.1201741 0.01641387 0.1139538 0.009017793 0.007333656 0.1916075
##
## solution.w:
##  0.2181975 8.98e-08 0.1581311 2.01e-08 4.31e-08 1.78e-08 1.57e-07 0.6236697 1e-10 9.96e-07 1.83e-08 1
##
## [1] 18
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 0.01349433
##
## solution.v:
##  0.1085492 0.1128878 0.1404557 0.1406928 0.1058068 0.124376 0.1845274 0.07497442 0.007729835
##
## solution.w:
##  5.55e-08 1.07e-08 3.86e-08 8.7e-09 4.21e-08 3.44e-08 2.16e-08 7.6e-09 2.9e-09 7.67e-08 1.11e-08 0.4
```

```
##
## [1] 19
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 4.947743e-05
##
## solution.v:
##  1.2587e-06 0.02728862 0.03170358 0.05771974 0.1960737 0.006925313 0.4348989 0.2331587 0.01223014
##
## solution.w:
##  6.767e-07 5.98019e-05 2.985e-07 4.58e-08 0.04826993 1.9e-09 3.59e-07 6.67e-08 1.824e-07 3.5752e-06 4
##
## [1] 20
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
## ****************
##
## MSPE (LOSS V): 3.005301e-10
##
## solution.v:
##  0.1989304 0.01786662 0.007655385 0.00733622 0.007446477 0.0008580075 0.04284535 0.7154481 0.0016134
##
## solution.w:
##  4.794e-07 0.1807966 9.276e-07 4.006e-07 7.308e-07 6.546e-07 7.896e-07 5.109e-07 5.848e-07 1.2738e-0
##
## [1] 21
##
## X1, X0, Z1, Z0 all come directly from dataprep object.
##
##
## ****************
##  searching for synthetic control unit
##
##
## ****************
## ****************
```

```
## ****************
##
## MSPE (LOSS V): 0.007020017
##
## solution.v:
##  0.0004763812 0.0003974682 9.85404e-05 0.1595424 0.0461664 0.0001350971 0.7598251 0.02340329 0.00995
##
## solution.w:
##  3.31e-08 4.14e-08 5.3e-07 4.54e-08 3.79e-08 3.9e-08 3.84e-08 4.46e-08 4.68e-08 3.26e-08 5.0342e-06 0
##
## [1] 22
```

```
## bad fit
```




```
## null device
##           1
```

The above synthetic case study focuses on New Jersey Legislative Assemblymen, depicting that voting patterns do not change significantly whether an assembly man is either publicly or privately financed. Black lines represent legislators who took public financing and gray lines represent control legislators who did not participate.

Lm regressions

We also see the use of linear regression statistical modeling in state-wide use of legislative financing comparison:

New Jersey Legislative Assembly modeling:

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Sun, May 09, 2021 - 11:09:35

Table 1:

	Dependent variable:
	extremity
variance	5.244^{***}
	(0.370)
Leader	0.059
	(0.070)
MoneyRaised	0.00000
	(0.00000)
Seniority	0.010^{**}
	(0.004)
Vote	-0.002
	(0.004)
Race	-0.071
	(0.061)
female	0.044
	(0.042)
gop	1.471^{***}
	(0.080)
Pres_DemShare_2000	-0.641^{**}
	(0.267)
post.treat	0.087^{**}
	(0.042)
treated	-0.037
	(0.075)
post.treat:treated	0.031
	(0.093)
Constant	-0.056
	(0.171)
Observations	264
R^2	0.710
Adjusted R^2	0.697
Residual Std. Error	0.261 (df = 251)
F Statistic	51.323^{***} (df = 12; 251)
Note:	*p<0.1; **p<0.05; ***p<0.01

(Intercept) variance Leader MoneyRaised -0.056 5.244 0.059 0.000 Seniority Vote Race female 0.010 -0.002 -0.071 0.044 gop Pres_DemShare_2000 post.treat treated 1.471 -0.641 0.087 -0.037 post.treat:treated 0.031 2.5 % 97.5 % -0.153 0.216 [1] 0.008 2.820 97.5 % 0.4550749

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu % Date and time: Sun, May 09, 2021 - 11:09:35

(Intercept) variance Leader MoneyRaised -0.610 3.597 0.310 0.000 Seniority Vote Race female 0.015 0.003 0.082 0.317 gop Pres_DemShare_2000 post.treat treated 1.783 -0.582 0.011 -0.153 post.treat:treated 0.027 2.5 % 97.5 % -0.444 0.497 [1] 0.535 4.274 97.5 % 0.5433082

Public Financing and the Electoral Connection Between Private Donors and Legislators

The linear regressions show the importance of polarization and how each legislator votes. We see here that there is not much of a difference between a legislator that was funded publicly and privately. Voting remains the same, and coefficient estimates in change do not prove to be statistically significant.

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu % Date and time: Sun, May 09, 2021 - 11:09:35

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu % Date and time: Sun, May 09, 2021 - 11:09:35

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu % Date and time: Sun, May 09, 2021 - 11:09:35

(Intercept) ideology ideoex dividedgov 1.217 0.000 -0.002 -0.038 gopshare deficit squire_score income -0.703 0.000 0.981 0.000 unemployment population populationdensity grants -0.023 0.000 -0.001 0.000 gsp termlimits_house termlimits_senate demcontrol 0.000 0.059 0.024 0.065 clp govideo2 west mwest -0.035 -0.001 0.296 -0.060 south post.treat treated post.treat:treated -0.135 0.028 0.090 0.100 2.5 % 97.5 % -0.069 0.269 [1] 0.408 3.000 97.5 % 0.660608

Findings:

Both the synthetic case studies and the linear regression models above provide evidence that public financing has a very insignificant effect on legislative voting behavior. Evidence above actually shows that legislators basically vote the same whether they are publicly or privately funding, suggesting that campaign finance does not heavily affect legislative polarization. Therefore, the authors discover that although campaign finance remains a volatile expression of political freedom and expression, it does not constitute as a significant influence in the polarization of individual legislators or legislative parties. Voting is not significantly changed by private donations, most likely due to the assumption that a return is not expected during the time of a donation, and instead, private donors already focus on representing the legislators they already know they will agree with, rather than attempt to influence ones they do not.

Project Expansion:

There is many ways this project could be expanded. First, it was acknowledged that limitations in data collection exist, as the data set is extremely narrow. Further data collection and a differences and differences approach using states with publicly funded legislative offices could provide more concrete evidence to the findings of Harden and Kirkland (2016). There is much left to be explored and extended content-wise within this study as well. Yes, it is determined that public financing has no effect on voting behavior, but there could be many other notable effects. It could influence other parts of the legislative-decision making process, such as bill authoring lobbying, that were not focused upon in this study. A written extension of this paper could be expanded in such manner.

Table 2:

	Dependent variable:
	extremity
variance	3.597***
	(0.477)
Leader	0.310
	(0.209)
MoneyRaised	0.00000
	(0.00000)
Seniority	0.015
	(0.014)
Vote	0.003
	(0.008)
Race	0.082
	(0.125)
female	0.317***
	(0.109)
gop	1.783***
	(0.159)
Pres_DemShare_2000	−0.582
	(0.599)
post.treat	0.011
	(0.122)
treated	−0.153
	(0.154)
post.treat:treated	0.027
	(0.237)
Constant	−0.610
	(0.530)
Observations	130
R^2	0.753
Adjusted R^2	0.728
Residual Std. Error	0.477 (df = 117)
F Statistic	29.785*** (df = 12; 117)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 3:

	Dependent variable:
	pm
ideology	0.0003
	(0.001)
ideoex	−0.002
	(0.003)
dividedgov	−0.039
	(0.041)
gopshare	−0.668***
	(0.250)
deficit	−0.00000
	(0.00000)
squire_score	0.976***
	(0.182)
income	0.00002***
	(0.00000)
unemployment	−0.020
	(0.012)
population	0.00000***
	(0.000)
populationdensity	−0.001***
	(0.0001)
grants	−0.000***
	(0.000)
gsp	0.00000*
	(0.00000)
termlimits_house	0.058*
	(0.032)
termlimits_senate	0.034
	(0.033)
demcontrol	0.069
	(0.064)
clp	−0.027
	(0.025)
govideo2	−0.001
	(0.001)
west	0.283***
	(0.047)
mwest	−0.078*

Table 4:

	Dependent variable:
	avgdist
ideology	0.00003
	(0.001)
ideoex	−0.001
	(0.002)
dividedgov	0.015
	(0.025)
gopshare	−0.425***
	(0.151)
deficit	0.00000
	(0.00000)
squire_score	0.449***
	(0.110)
income	0.00001***
	(0.00000)
unemployment	0.005
	(0.007)
population	0.00000***
	(0.000)
populationdensity	−0.001***
	(0.00004)
grants	−0.000***
	(0.000)
gsp	0.00000
	(0.00000)
termlimits_house	0.017
	(0.019)
termlimits_senate	0.024
	(0.020)
demcontrol	0.082**
	(0.039)
clp	−0.005
	(0.015)
govideo2	−0.0004
	(0.001)
west	0.146***
	(0.028)
mwest	−0.053**

Table 5:

	Dependent variable:
	pm3
ideology	−0.0002
	(0.001)
ideoex	−0.002
	(0.002)
dividedgov	−0.038
	(0.032)
gopshare	−0.703***
	(0.203)
deficit	−0.00000
	(0.00000)
squire_score	0.981***
	(0.131)
income	0.00002***
	(0.00000)
unemployment	−0.023**
	(0.010)
population	0.00000***
	(0.000)
populationdensity	−0.001***
	(0.0001)
grants	−0.000***
	(0.000)
gsp	0.00000**
	(0.00000)
termlimits_house	0.059**
	(0.027)
termlimits_senate	0.024
	(0.029)
demcontrol	0.065
	(0.050)
clp	−0.035*
	(0.020)
govideo2	−0.001
	(0.001)
west	0.296***
	(0.036)
mwest	−0.060*

As for an expansion on this particular study, one can go beyond a linear regression model and run other types of models to see other effects of public financing and voting. Below, I take models previously done above in the study, specifically the ones focusing on New Jersey floor roll calls, and run a quasi-poisson model to look for over-dispersion. I then run Chi Square tests to test for such over-dispersion (code in .Rmd file).

```
##
## Call:
## glm(formula = extremity ~ variance + Leader + MoneyRaised + Seniority +
##     Vote + Race + female + gop + Pres_DemShare_2000 + post.treat +
##     treated + post.treat * treated, family = quasipoisson, data = assemb.floor)
##
## Deviance Residuals:
##      Min        1Q    Median        3Q       Max
## -0.96920  -0.14690  -0.01164   0.14360   0.76193
##
## Coefficients:
##                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)        -9.938e-01  1.396e-01  -7.117 1.15e-11 ***
## variance            5.002e+00  3.306e-01  15.131  < 2e-16 ***
## Leader              4.166e-02  4.913e-02   0.848  0.39732
## MoneyRaised         3.761e-08  6.662e-08   0.564  0.57296
## Seniority           7.418e-03  3.273e-03   2.267  0.02427 *
## Vote               -1.782e-03  2.602e-03  -0.685  0.49411
## Race               -1.363e-01  5.063e-02  -2.691  0.00759 **
## female             -7.480e-03  3.193e-02  -0.234  0.81497
## gop                 1.304e+00  6.840e-02  19.062  < 2e-16 ***
## Pres_DemShare_2000 -6.523e-01  2.143e-01  -3.044  0.00258 **
## post.treat          6.677e-02  3.156e-02   2.116  0.03535 *
## treated            -5.681e-02  5.949e-02  -0.955  0.34059
## post.treat:treated  3.749e-02  7.245e-02   0.518  0.60525
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for quasipoisson family taken to be 0.05108998)
##
##     Null deviance: 47.886  on 263  degrees of freedom
## Residual deviance: 13.522  on 251  degrees of freedom
## AIC: NA
##
## Number of Fisher Scoring iterations: 4
```

```
##
## % Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harva
## % Date and time: Sun, May 09, 2021 - 11:09:35
## \begin{table}[!htbp] \centering
##   \caption{}
##   \label{}
## \begin{tabular}{@{\extracolsep{5pt}}lc}
## \\[-1.8ex]\hline
## \hline \\[-1.8ex]
##  & \multicolumn{1}{c}{\textit{Dependent variable:}} \\
## \cline{2-2}
## \\[-1.8ex] & extremity \\
## \hline \\[-1.8ex]
##  variance & 5.002$^{***}$ \\
```

```
##   & (0.331) \\
##   & \\
##  Leader & 0.042 \\
##   & (0.049) \\
##   & \\
##  MoneyRaised & 0.00000 \\
##   & (0.00000) \\
##   & \\
##  Seniority & 0.007$^{**}$ \\
##   & (0.003) \\
##   & \\
##  Vote & $-$0.002 \\
##   & (0.003) \\
##   & \\
##  Race & $-$0.136$^{***}$ \\
##   & (0.051) \\
##   & \\
##  female & $-$0.007 \\
##   & (0.032) \\
##   & \\
##  gop & 1.304$^{***}$ \\
##   & (0.068) \\
##   & \\
##  Pres\_DemShare\_2000 & $-$0.652$^{***}$ \\
##   & (0.214) \\
##   & \\
##  post.treat & 0.067$^{**}$ \\
##   & (0.032) \\
##   & \\
##  treated & $-$0.057 \\
##   & (0.059) \\
##   & \\
##  post.treat:treated & 0.037 \\
##   & (0.072) \\
##   & \\
##  Constant & $-$0.994$^{***}$ \\
##   & (0.140) \\
##   & \\
## \hline \\[-1.8ex]
## Observations & 264 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:}  & \multicolumn{1}{r}{$^{*}$p$<$0.1; $^{**}$p$<$0.05; $^{***}$p$<$0.01} \\
## \end{tabular}
## \end{table}
```

```
## [1] 0.05108997
```

```
## [1] 1
```

```
## [1] 0.0005965113
```

Due to our low values, we see that the model is still a good fit for the data, even though over-dispersion does exist slightly.

Conclusion:

In this project, I walked through the study and analysis done in the piece Harden and Kirkland (2016): "Do Campaign Donors Influence Polarization? Evidence from Public Financing in the American States," which looked at the effects of public financing on legislative polarization. I walked through the synthetic case study used to determine this answer, as well as the linear regression models that sought to discover a connection between voting patterns in the Legislative and public financing. I replicated the models accurately showcasing the viewer of this project the analysis conducted. I also put the statistic results of the linear regression models into stargazer table, allowing them to be understood and interpreted easier for the viewer. Contrary to popular general belief, the authors provide evidence that campaign funding has minimal influence on polarization. After replication of the figures and tables, I ultimately agree with these outcomes, as I was able to reproduce the same results.

Finally, I expanded upon this paper qualitatively, discussing further steps one could take in data collection and expansion in studying the effects of campaign finance on the decision-making structure of legislatures in the United States. Quantitatively, I also included a quasi-poisson model in order to account for over-dispersion in the data, and conducted a Chi-Square test on this. I was able to determine that the data does fit the model properly, an important note of this study.

I would like to thank Jeffrey Harden and Justin Kirkland for making their data readily available for public use, as this allows students and researchers to properly replicate their work and fully understand their findings. I would also like to thank Professor Jeff Gill and Le Bao for their work this semester, as this course has become fundamental to my understanding of statistical modeling, and an essential component of my future in data science.

Citations:

Gilens, Martin. Affluence and Influence: Economic Inequality and Political Power in America. PRINCETON; OXFORD: Princeton University Press, 2012. doi:10.2307/j.ctt7s1jn.

Hamm, Keith E, and Hogan, Robert E. "Campaign Finance Laws and Decisions in State Legislative Candidacy Elections." Political Research Quarterly 61, no. 3 (2008): 458-67.

Harden, Jeffrey J., and Justin H. Kirkland. "Do Campaign Donors Influence Polarization? Evidence from Public Financing in the American States." Legislative Studies Quarterly 41, no. 1 (2016): 119-52. doi:10.1111/lsq.12108.

Schlozman, Kay Lehman, Verba, Sidney, and Brady, Henry E. The Unheavenly Chorus. Princeton: Princeton University Press, 2012.

Thomas Stratmann, and Francisco J. Aparicio-Castillo. "Competition Policy for Elections: Do Campaign Contribution Limits Matter?" Public Choice 127, no. 1/2 (2006): 177-206.

Link to my Github with all of the Rmd code and associated files: **https://github.com/daililo/ReplicationProject.git**