

Gov 52 Final Project

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Introduction

In their paper “Legislative Term Limits and Polarization,” Michael Olson and Jon Rogowski explore the causal impact of the adoption of legislative term limits on representation in state governments.^{1 2} The paper specifically asks how legislative term limits affect representation and polarization and if this relationship is modified by the professionalism of the legislature. The authors hypothesize that the implementation of term limits will increase polarization, and that the increase will be greater in more professional legislatures. This hypothesis is generated based on two causal mechanisms:

- Firstly, the authors theorize that term limits reduce a legislator’s need to understand and respond to their constituency’s demands as they know that they will not have the possibility of a long career or repeated reelection.
- Secondly, the authors theorize that qualified candidates will be less likely to run for positions with term limits due to the reduced job security, and as a result, parties will be more inclined to run candidates with strong ideological views and party loyalty.

To answer the above questions, the paper uses panel data on roll call voting in the years between 1993 and 2016 by state as well as indicators for a divided government, legislative professionalism, and party competitiveness. The primary model used by the authors is a multiunit difference-in-difference design described by this linear regression model:

$$Y_{it} = \beta_0 + \beta_1 \text{Term limits}_{it} + X_{it}\Omega + D_i + T_t + \epsilon_{it}$$

In the above regression, Y is the level of polarization in a state’s legislature i in year t , the term limits variable indicates whether state i had term limits in year t , Ω is a vector of coefficients for state-level time varied covariates X_{it} (divided government, legislative professionalism, party competitiveness), D_i is an indicator for state fixed effects, T_t is an indicator for year fixed effects, and ϵ is a random error term.

The authors concluded that the implementation of term limits led to higher levels of polarization in state legislatures as evidenced by an increased ideological gap between the parties in voting patterns. Furthermore, the authors conclude that this effect is larger for more professional legislatures defined as those which have longer sessions and higher salaries. The authors also find that the effects of term limits appeared to be twice as large for Republican legislators as for Democratic legislators. Finally, these results were robust across a large number of model types and specifications.

¹Replication data and code for this report can be accessed on github at https://github.com/OwenBernstein/Gov_52_Final_Project. The original report’s data and code can be accessed in the Harvard Dataverse at <https://doi.org/10.7910/DVN/GDZTK8>

²Olson, Michael P, & Rogowski, Jon C. (2020). Legislative Term Limits and Polarization. The Journal of Politics, 82(2), 572-586.

Replication Analysis

During this project, I was able to replicate all graphs, tables, and models created in the original paper. This includes both the following replicated materials as well as the supplementary materials which are not included in this report. I would like to thank the authors of the original paper, Michael P. Olson and Jon C. Rogowski, for making their data and code available to curious students.

Summary Statistics

In this paper, the authors seek to understand how the implementation of term limits affects polarization in state legislatures. The main outcome variable is legislative polarization. This is a measure of polarization devised by Shor and McCarty (2011) which uses roll call voting to classify each legislator's voting behavior on an ideological scale that ranges from approximately 0-3, with three being the most polarized. These individual scores are then aggregated to create a legislative polarization score for each state-year. The main explanatory variables used by the authors are term limits, divided government, logged legislative professionalism, and party competitiveness. Term limits is a binary variable that takes a value of 1 in state-years in which the legislature had a term limit. The divided government variable is also a binary variable taking the value of 1 in divided legislatures. The legislative professionalism variable, created by Squire (1992) and updated in Squire (2017), is a measure of a legislature's professionalism which takes into account salary, staff, and time in session. Finally, the party competitiveness variable is a measure of the majority party's seat share advantage. Below is a summary of each of these variables, specifically each variable's mean, median, minimum, maximum, and standard deviation.

Recreation of Table A.1: Summary Statistics of Key Variables³

```
##
## Summary Statistics of Key Variables
## =====
## Statistic          Mean   Median   Min     Max     St. Dev.
## -----
## Legislative Polarization 1.439   1.398   0.128   3.608   0.502
## Term Limits             0.201    0       0       1       0.401
## Divided Gov.            0.492    0       0       1       0.500
## ln(Leg. Professionalism) -1.786  -1.772  -3.612  -0.464   0.583
## Party Competitiveness   13.469  11.029   0.500   41.137   8.941
## -----
```

Main Models

To estimate the effect of term limits on legislative polarization, the authors use a variety of fixed effect linear models. In each model, the authors use a combination of the explanatory variables as well as state and year fixed effects to estimate legislative polarization. By including these fixed effects the authors seek to account for the exogenous effects caused by state and year. The effects of state and year are held constant which allows the authors to sort out the effect of these variables. The main models are described in Table 1.

The baseline model created by the authors (column 1), is a linear regression of term limits on legislative polarization with fixed effects for both year and state.

³While creating this report I encountered issues with TinyTeX. For this reason, tables in this report are recreated using the “text” option in Stargazer rather than LaTeX.

```
# Baseline model: l_diffs is legislative polarization, term_limit_temp is term limits
baseline_model <- felm(l_diffs ~ term_limit_temp |state+year|0|state, data=pol_dat)
```

The authors then create a second model in which covariates for divided government, legislative professionalism, and party competitiveness are added (column 2).

```
# Extended model: legprofscore is legislative professionalism, temp_abs_diff is
# party competitiveness

extended_model <- felm(l_diffs ~ term_limit_temp
                        +divided_gov
                        +legprofscore
                        +temp_abs_diff
                        |state+year|0|state
                        ,data=pol_dat)
```

The same baseline and extended models are then applied to exclusively state legislature Houses (columns 3, 4) and Senates (columns 5,6). The author chose to apply the model to the two chambers separately as they believed their could be asymmetric effects across the chambers. This theory was developed based on the common career pathway of legislators that begin in the lower chambers and then end in the upper chambers.

Recreation of Table 1: Term Limits and Polarization

```
##
## Term Limits and Polarization
## -----
##                               Polarization
## -----
##                               Pooled      House      Senate
## -----
##                               (1)      (2)      (3)      (4)      (5)      (6)
## -----
## Term Limits                  0.118**  0.113**  0.150**  0.141**  0.039  0.036
##                               (0.052) (0.052) (0.048) (0.047) (0.090) (0.090)
## Divided Gov.                  0.002      0.002      0.029
##                               (0.017)      (0.019)      (0.023)
## ln(Leg. Professionalism)      0.061      0.059      0.064
##                               (0.048)      (0.049)      (0.059)
## Party Competitiveness         -0.003      -0.004*      0.001
##                               (0.002)      (0.002)      (0.003)
## State Fixed Effects           Yes      Yes      Yes      Yes      Yes      Yes
## Year Fixed Effects            Yes      Yes      Yes      Yes      Yes      Yes
## Projected R Squared           0.039  0.06  0.054  0.078  0.002  0.011
## -----
##
```

As seen in the table above, the coefficient on term limits is statistically significant at an alpha level of 0.05 in both the baseline and extended models for the pooled data and House data, and is not statistically significant for the Senate data. In the pooled and House models, the effect of term limits is robust to the additional covariates.

In every model, the effect of term limits is positive, meaning that the implementation of term limits is correlated with an increase in legislative polarization on average. The magnitude of this effect is greatest in the lower chambers (House) and smaller in upper chambers.

Substantively, the authors theorize that the positive relationship between term limits and legislative polarization has two causes. The first is that legislators are aware that their term is ending are less inclined to meet the demands of their constituencies and will instead pursue their own ideological aims or the aims of their party. The second mechanism is that less-qualified candidates, and candidates more beholden to their political party, are more likely to hold office in legislatures with term limits. Both of these causes would lead to increased polarization in voting patterns.

Models by Political Party

The authors then sought to identify differential effects of term limits on legislative polarization for Democrats and Republicans. To do this, the authors use a second measure of legislative polarization with lower values indicating more liberal views and higher values indicating more conservative views. The extended model is recreated for each chamber-party combination. Results are displayed in Table 2.

Recreation of Table 2: Term Limits and Asymmetric Polarization: Party Medians

```
##
## Term Limits and Asymmetric Polarization
## -----
##                                     Party Medians
## -----
##                                Democrats      Republicans
## -----
##                                (1)      (2)      (3)      (4)      (5)      (6)
## -----
## Term Limits                    -0.037  -0.057  -0.024  0.077**  0.084**  0.012
##                               (0.037) (0.036) (0.052) (0.032) (0.037) (0.053)
## Divided Gov.                   -0.004  -0.005  -0.017  -0.001  -0.003  0.012
##                               (0.012) (0.014) (0.013) (0.009) (0.010) (0.017)
## ln(Leg. Professionalism)      -0.030  -0.055  0.011  0.031  0.004  0.075*
##                               (0.038) (0.040) (0.042) (0.030) (0.031) (0.043)
## Party Competitiveness          -0.000  0.000  -0.003  -0.004* -0.003* -0.002*
##                               (0.002) (0.002) (0.002) (0.002) (0.002) (0.001)
## Chamber                        Pooled   House   Senate   Pooled   House   Senate
## State Fixed Effects            Yes      Yes      Yes      Yes      Yes      Yes
## Year Fixed Effects             Yes      Yes      Yes      Yes      Yes      Yes
## Projected R Squared            0.011    0.024    0.026    0.112    0.1      0.021
## Observations                   987      987      987      987      987      987
## -----
##
```

As seen above, the coefficient on term limits is negative for all Democrats indicating that term limits move Democratic legislators to more liberal voting patterns. On the other hand, the coefficient on term limits is positive for all Republicans indicating that term limits move Republican legislators to more conservative voting patterns. Another important insight is that the magnitude of the coefficient is greater for Republican legislators suggesting that term limits have a larger effect on Republicans than Democrats. Finally, the coefficient is only statistically significant at an alpha level of 0.05 for the pooled and lower chamber models for Republicans. Substantively, the authors argue that these results show that increased polarization in legislatures is primarily caused by a shift of Republican legislators to the ideological right.

Models for Additional Measures

After determining the effects of term limits on legislative polarization, the authors sought to determine the effect of term limits on related measures of a legislature's effectiveness. The specific additional measures the authors use are party share contributions (the share of campaign contributions coming from political party committees) and PAC share contributions (the share of campaign contributions coming from political action committees.)

This analysis also focuses on the effect of legislative professionalism. Specifically, the below models include an interaction term of legislative professionalism and term limits. This is included in order to determine if the effect of term limits differs at different levels of legislative professionalism. Results are displayed in table 3.

Recreation of Table 3: Term Limits, Legislative Professionalism, and Party Influence

##				
##	Term Limits, Legislative Professionalism, and Party Influence			
##	-----			
##	Dependent variable:			
##	-----			
##	Pooled Polarization	Party Contributions	PAC Contributions	
##	-----			
##	(1)	(2)	(3)	
##	-----			
##	Term Limits	0.342**	0.080**	-0.136
##		(0.164)	(0.040)	(0.086)
##	ln(Leg. Professionalism)	0.052	0.065	-0.028
##		(0.050)	(0.040)	(0.034)
##	Term Limits X ln(Professionalism)	0.141*	0.036*	-0.053
##		(0.081)	(0.021)	(0.043)
##	Controls	Yes	Yes	Yes
##	State Fixed Effects	Yes	Yes	Yes
##	Year Fixed Effects	Yes	Yes	Yes
##	Projected R Squared	0.084	0.060	0.040
##	Observations	987	398	398
##	-----			
##				

As seen above, the coefficient on term limits is positive and statistically significant at an alpha level of 0.05 for the party contributions model. This suggests that the implementation of term limits is correlated with an increase in party contributions to campaigns. On the other hand, the share of contributions that come from PACs decreases with term limits although the coefficient in this case is not statistically significant at an alpha level of 0.05.

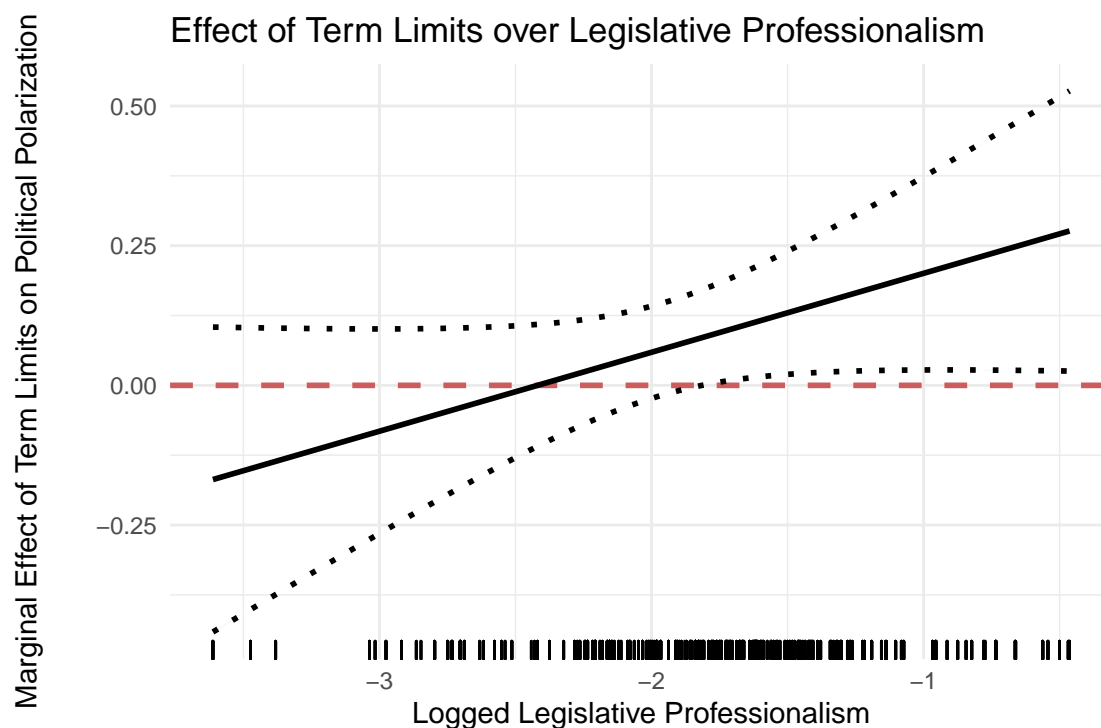
The authors theorize that the relationship between term limits and party contributions is caused by political parties' desire to fill seats with ideologically consistent legislators. Specifically, the political parties see term limits as a way to gain more political influence and consistent voting. On the other hand, the authors theorize that PACs' main goal is to gain access to legislators and therefore are less willing to spend money on term-limited legislators.

The coefficient on the interaction of term limits and legislative professionalism is positive and statistically significant in both the pooled polarization model and the party contributions model. This suggests that the effect of term limits on these two measures is greater in more professional legislatures.

The authors theorize that this is because legislators in more professional settings typically have more knowledge and expertise than those in less professional settings. The implementation of term limits forces these

experienced legislators out of office and replaces them with significantly less qualified, and typically more ideologically consistent, legislators. This means that the effect of term limits will have a greater magnitude in professional legislatures. The interaction between term limits and legislative professionalism is presented graphically in figure 1.

Recreation of Figure 1: Effect of Term Limits over Legislative Professionalism



This graph shows that as logged legislative professionalism increases, the marginal effect of term limits on political polarization also increases. As the authors theorized, the effect of term limits is greatest in the most professional legislatures.

Model Robustness Checks

To confirm the relationship between term limits and political polarization, the authors run models with additional covariates as a robustness check. The additional covariates include state level variables such as logged population, per capita income, unemployment rate, percent foreign born, and Gini coefficient. Results are presented in Table B.3.

```
# Additional Covariates Model:
```

```
ec_senate_cov <- feIm(s_diffs~term_limit_temp
                      +divided_gov+legprofscore
                      +temp_abs_diff+gov_party
                      +logpop+pc_income
                      +unemploy+pct_fb
                      +gini
                      |state+year|0|state
                      ,data=pol_dat)
```

Recreation of Table B.3: Term Limits and Polarization: Additional Covariate Control

```
##
## Term Limits and Polarization: Additional Covariate Control
## -----
##                               Polarization
##                               -----
##                               Pooled   House   Senate
##                               -----
##                               (1)      (2)      (3)
## -----
## Term Limits                  0.090**  0.117**  0.006
##                               (0.043)  (0.041)  (0.082)
## Divided Gov.                 0.008    0.009    0.038*
##                               (0.015)  (0.017)  (0.019)
## ln(Leg. Professionalism)    0.030    0.028    0.035
##                               (0.032)  (0.034)  (0.047)
## Party Competitiveness       -0.003   -0.004*   0.001
##                               (0.002)  (0.002)  (0.002)
## Democratic Governor         0.013    0.023    0.000
##                               (0.020)  (0.024)  (0.024)
## ln(Population)              1.272**  1.216**  1.155**
##                               (0.423)  (0.441)  (0.458)
## Per Capita Income           -0.012** -0.014** -0.021**
##                               (0.005)  (0.004)  (0.007)
## Unemployment Rate           -0.007   -0.003   -0.044*
##                               (0.008)  (0.009)  (0.023)
## Percent Foreign Born        -1.260   -1.201   -1.209
##                               (1.154)  (1.203)  (1.837)
## State Gini Coefficient       -0.329   -0.326    0.216
##                               (0.283)  (0.293)  (0.501)
## -----
## State Fixed Effects          Yes      Yes      Yes
## Year Fixed Effects           Yes      Yes      Yes
## Projected R Squared         0.269    0.257    0.153
## Observations                987      987      987
## -----
##
```

As seen above, the coefficient on term limits continues to be positive and statistically significant at an alpha level of 0.05 for the pooled data and lower chamber data. This suggests that the effect of term limits is robust to a variety of additional covariates.

Extension

To extend the original analysis of the “Legislative Term Limits and Polarization” paper, I have created two additional models. Each of these models are fixed effect linear models and the outcome variable continues to be legislative polarization as used in the previous models. My additional models differ in their explanatory variables. In the first additional model, I add a fixed effect for region based on a theory that region effects the performance of legislators. The second additional model lags the effect of the implementation of term limits by 4 years to account for the possibility that effects from implementation may not occur until legislators complete their term in office. Below, I explain the reasoning for each additional model and display the results.

Effect of Region

The first additional model I create adds a fixed effect to the baseline model created by the authors. The region variable I create takes four values, Northeast, Midwest, South, and West. There are 10 states in the Northeast, 11 in the Midwest, 13 in the West, and 15 in the South for a total of 49.⁴

I chose to add a regional fixed effect based on the theory that legislators’ behavior differs based on their geographic region. Kernell (1977) argues that less legislator turnover in the South has created a more professional legislature with relatively more expertise. Based upon this assumption, I hypothesize that implementing term limits in the South would cause a larger increase in polarization as the skill and qualification gap between the new legislators and prior legislators would be greater than in other regions. For this reason, adding a region fixed effect could control for these differences.

In the table below the results of six regression models are displayed. Columns 1 and 2 use pooled data, 3 and 4 use lower chamber data, and 5 and 6 use upper chamber data. Columns 2, 4, and 6 include a region fixed effect.

Table 4: Region Fixed Effect

## Term Limits and Polarization With Region Fixed Effects						
##	Polarization					
	Pooled		House		Senate	
##	(1)	(2)	(3)	(4)	(5)	(6)
## Term Limits	0.118**	0.118**	0.150**	0.150**	0.039	0.039
##	(0.052)	(0.052)	(0.048)	(0.048)	(0.090)	(0.090)
## State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
## Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
## Region Fixed Effects	No	Yes	No	Yes	No	Yes
## Projected R Squared	0.039	0.039	0.054	0.054	0.002	0.002
## Note. Linear Regression Coefficients with standard errors clustered on states in parentheses.						

As seen in the table above, the addition of region fixed effects has no effect on any of the models. The coefficient on term limit remains the same in each variation of the model regardless of the addition of the region fixed effects. This suggests that region does not help explain differences in legislative polarization.

⁴Nebraska is excluded as specified in the authors’ original report.

Lagged Polarization

The second additional model I create lags the term limits variable by 4 years for each state. The original model attempts to explain legislative polarization as a function of term limits in the same year. This approach could potentially ignore the delayed effects of the implementation of term limits. For example, the implementation of term limits may not immediately effect the behavior of legislators as they could still run for a single additional term or because the highly qualified legislators remain in office until the end of their current term. However, after 4 years, many legislators will have been forced to leave office or will no longer be allowed to run for additional terms. For this reason, the effect of term limits may be delayed up to 4 years. Therefore, I hypothesize that the effect of term limits on legislative polarization will be greater when using the lagged term limits variable.

The table below shows the results of the additional models. Each column uses pooled data. Columns 1 and 2 use only term limit as an explanatory variable, while 3 and 4 use additional covariates. Columns 2 and 4 use the lagged term limits variable.

Table 5: Lagged Polarization

##					
##	Term Limits and Polarization				
##	-----				
##		Polarization			
##		-----			
##		Pooled			
##		-----			
##		(1)	(2)	(3)	(4)
##		-----			
##	Term Limits	0.118**	0.123*	0.113**	0.121*
##		(0.052)	(0.067)	(0.052)	(0.065)
##	Divided Gov.			0.002	0.002
##				(0.017)	(0.016)
##	ln(Leg. Professionalism)			0.061	0.057
##				(0.048)	(0.048)
##	Party Competitiveness			-0.003	-0.004*
##				(0.002)	(0.002)
##	State Fixed Effects	Yes	Yes	Yes	Yes
##	Year Fixed Effects	Yes	Yes	Yes	Yes
##	Lag	No	Yes	No	Yes
##	Projected R Squared	0.039	0.05	0.06	0.074
##		-----			
##	Note. Linear Regression Coefficients with standard errors clustered on states in parentheses.				

As seen in the table above, using a lagged term limit variable does affect the model output. For both the baseline and extended models, the usage of the lagged term limits variable increased the magnitude of the coefficient on term limits. This is in line with my hypothesis that the effect of term limits becomes more pronounced after 4 years. However, the standard error for both the baseline and extended models also increased. This means that the coefficient on term limits is no longer significant at an alpha level of 0.05 when using the lagged term limits variable. This could be because lagging the term limits variable results in fewer observations of legislative polarization in which term limits have been implemented.

Conclusion

In this project, I was able to replicate all of the relevant graphs, tables, and models created in the original paper. Specifically, I was able to replicate the various models used to understand the relationship between the implementation of term limits and legislative polarization.

This research has shown that the implementation of term limits increases legislative polarization. This is most likely because legislators are less inclined to meet the demands of their constituencies and because term limits lead to the election of less qualified, more ideologically consistent legislators. Furthermore, this research has shown that these effects are most prominent in the lower chambers of a state's legislature and also more pronounced among Republicans. The research also concludes that the relationship between term limits and legislative polarization is more pronounced in more professional legislatures. This is most likely because replacing the highly qualified, expert legislators in professional legislatures with less qualified legislators has a greater effect than replacing the less qualified legislators in less professional legislatures. The final conclusion of the paper is that term limits increase the share of campaign contributions that come from party committees and decrease the share that come from PACs. This is most likely because party committees have a greater interest in securing votes while PACs have an interest in extended access to legislators.

In extending the analysis of this paper, I added a fixed effect for region and created an additional model with lagged effects of term limits. The regional fixed effect did not have any effect on the model and therefore suggests that regions do not help explain differences in legislative polarization. Using the lagged term limits variable did have an effect on the model. Specifically, the magnitude of the effect of term limits on legislative polarization was greater when lagged term limits were used. This suggests that the effect of term limits is most prominent at least four years after their implementation.

The conclusions of this paper are limited by a variety of factors. The first limiting factor is that the main outcome variable, legislative polarization, is constant over the course of a legislators career which means that individual level changes in polarization can not be included in models. A second potential limitation could be the existence of reverse causality. In this context, it is possible that legislatures that are becoming more polarized lead to the implementation of term limits rather than term limits causing increased legislative polarization.

Further research on this topic could address the first of these limitations. Specifically, further research could use a different measure of polarization to discover how the implementation of term limits affects an individual's voting behavior rather than the legislative body as a whole. Another avenue for further research could be voters' responses to term limits. This research could answer questions such as: do voters respond to legislators' increased polarization? Future research could also investigate parties', PACs', and activists' responses to term limits. Aside from changing spending patterns, do these groups behave differently in the presence of term limits?

Finally, I would once again like to thank the original authors of this paper, Micael P. Olson and Jon C. Rogowski, for making their data and code available to other researchers.

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