The Effect of Polarization on Bills Passed in Congress

Data Analysis

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Executive Summary

This research demonstrates the relationship between polarization and legislative productivity in both chambers of Congress. We aimed to discover the effect of polarization on the overall productivity in legislation, and whether or not the relationship between the two was significant enough to be characterized as causal. For the purposes of the experiment, legislative productivity is quantified as the amount of time a bill is spent in Congress from the time it is introduced to the time both the Senate and the House pass it. The study employs data from UCLA's Voteview database to quantify polarization in the Senate and the House of Representatives, as well as data from Brookings Institute to encapsulate the legislative productivity of both houses. In addition, our research utilized the data from 1947 to 2017 as the datasets converged in these years. Implementing these datasets into our study, linear regression models reveal that there is a significant and insignificant relationship between polarization and legislative productivity in the House of Representatives and the Senate, respectively. These results suggest the impactful hindrance political polarization has on the overall productivity of legislation in the United States government and the need for more research on this topic.

Introduction

Contemporary American society has witnessed a striking level of public disapproval of Congress as an extraordinary 72% of Americans express unfavorable views of the "do-nothing" legislative branch[1]. This high level of discontent has surged from the late 2000s to the present, with a substantial increase in the number of individuals who held negative perceptions. Coinciding with this rise of discontent is the growing polarization of the American political sphere, indicating the potential interconnectedness of ideological isolation and the overall performance of American politics. Critics have targeted the '"do-nothing," dysfunctional, unproductive system of Congress, citing examples of the 112th and 113th Congress sessions that exhibited reduced levels of passed legislation and greater levels of federal government shutdowns.[2]

A significant cause of Congressional dysfunction is the "inability of members of the two political parties [Democrats and Republicans] to compromise and reach agreement on major issues,"[3] which is only amplified by greater polarization into more extreme ideological notions. Politicians have adapted to the Hastert Rule for Congressional proposals, in which most politicians will not propose a bill unless they can secure party-majority approval. The rule is "designed to limit the ability of minority members to co-opt a few majority members and pass legislation,"[4] amplifying a gridlock in a divided Congress, especially across its chambers.

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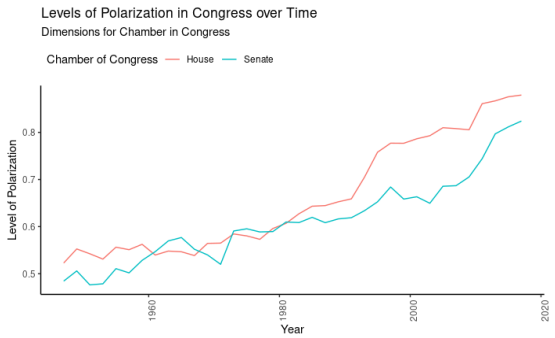
[1] "3. How Americans View Congress, the President, State and Local Political Leaders." *Pew Research Center - U.S. Politics & Policy*, Pew Research Center, 19 Sept. 2023, www.pewresearch.org/politics/2023/09/19/how-americans-view-congress-the-president-state-and-local-political-leaders/.

[2] Fechner, Holly. "Managing Political Polarization in Congress: A Case Study on the Use of the Hastert Rule Symposium: Governing the United States in 2020 ." *HeinOnline*, p.757-758, HeinOnline.org, heinonline.org/HOL/Page?collection=journals&handle=hein.journals%2Futahlr2014&id=790&men_tab=srchresults.

[3] Fechner, Holly. "Managing Political Polarization in Congress: A Case Study on the Use of the Hastert Rule Symposium: Governing the United States in 2020 ." *HeinOnline*, p.761, HeinOnline.org, heinonline.org/HOL/Page?collection=journals&handle=hein.journals%2Futahlr2014&id=790&men_tab=srchresults.

[4] McCarty, Nolan. "Polarization, Congressional Dysfunction, and Constitutional Change Symposium ." *HeinOnline*, p.236, HeinOnline.org, heinonline.org/HOL/Page?handle=hein.journals%2Findilr50&id=233&collection=journals&index=.



Change in levels of polarization by Chamber of Congress over time

The question in focus for the study is as follows: what is the effect of polarization on the average number of days a bill is introduced to its enactment? The extent to which polarization affects political environments in its effectiveness and productivity has been under increasing investigation as tensions worsen between differing groups of ideological preferences. With increasing turmoil between diverging parties and productivity at risk, it is crucial to understand whether the effect of polarization in Congress is remarkable in its productivity over time.

We hypothesize that there is a significant, negative relationship between political polarization and the overall productivity of the Congressional body. Between general trends, observations, and some existing research on the topic, there is substantial evidence for there to be a more causal effect on Congressional productivity as a result of dangerous levels of polarization. One study found that "the least polarized congressional term produce[d] 111% more legislation than the most polarized,"[5] serving as a point of reference for greater analysis and comparison between these relationships across the House and the Senate.

Data Description

To examine this relationship between political polarization and productivity within the context of Congressional politics, three data sources were acquired. The polarization data was acquired from the UCLA Voteview database, providing a large multitude of variables covering the extent and diversity of political ideology and relationships among members of Congress over time. These various relationships take into consideration the political party, region (North/South), and the independent variable of interest– "Difference in Party Means - first dimension." This difference in "first dimension means" refers to the "level of political polarization,"[6] which was utilized for this analysis; it is important to note that alternative measures of polarization do exist.

The other two datasets were sourced from the Brookings Institute's *"Vital Statistics on Congress*,*"* with each pertaining to the House of Representatives and Senate, respectively. Both datasets were identical with the exception of the data and values being correlated to their respective chamber. Overall, these datasets provided insight into the bills introduced, bills passed, and time spent in sessions with relevant statistics for averages and relationships between complementary variables. For this study, the variables of interest were the ratio of bills passed to bills introduced and the number of days spent in session; the relationship between this ratio and

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[5] McCarty, Nolan. "Polarization, Congressional Dysfunction, and Constitutional Change Symposium ." *HeinOnline*, p.236, HeinOnline.org, heinonline.org/HOL/Page?handle=hein.journals%2Findilr50&id=233&collection=journals&index=.

[6] "The Polarization of the Congressional Parties." *Political Polarization*, University of Georgia , legacy.voteview.com/political_polarization_2015.htm.

time was determined by the following calculation in order to create a standardized measure: $\frac{Ratio\ of\ Bills\ Passed\ to\ Bills\ Introduced}{Number\ of\ Days\ in\ Session}$.

To run the analysis, an inner join was enacted on the "work" datasets and the polarization data on the Congressional session variable and respective chamber. The primary variables of interest (political polarization, ratio of bills, number of days in session), alongside some others for reference, are presented in the following tables with some notable differences: (1) there is about three times the number of bills introduced in the House compared to the Senate; (2) the House has 50% less bills passed in comparison to the number of bills introduced; (3) the Senate spends approximately 30 more days in session per session compared to the House. These differences have potential explanations and effects on the overall relationship between productivity and polarization across the two chambers.

Descriptive Statistics (House of Rep.)

Statistic	N	Mean	St. Dev.	Min	Max
Session	36	97.500	10.536	80	115
Year	36	1,982.000	21.071	1,947	2,017
Polarization Level	36	0.661	0.121	0.523	0.879
Bills Introduced	36	10,344.360	5,215.629	4,542	22,060
Avg Bills Introduced/Member	36	23.764	11.988	10.400	50.700
Bills Passed	36	1,180.306	521.822	561	2,482
Ratio of Bills Passed to Introduced	36	0.128	0.049	0.049	0.236
Recorded Votes	36	1,003.389	445.580	271	1,876
Days In Session	36	293.500	35.458	226	384

Descriptive Statistics (Senate)

Statistic	N	Mean	St. Dev.	Min	Max
Session	36	97.500	10.536	80	115
Year	36	1,982.000	21.071	1,947	2,017
Polarization Level	36	0.612	0.091	0.476	0.824
Bills Introduced	36	3,736.972	584.767	2,266	4,867
Average Bills Introduced/Member	36	37.664	6.073	22.700	48.700
Bills Passed	36	1,118.667	606.817	176	2,550
Ratio of Bills Passed to Introduced	36	0.294	0.135	0.043	0.564
Recorded Votes	36	652.278	258.612	224	1,311
Days In Session	36	318.333	38.666	224	389

Merged Polarization and Work Data for House of Rep. (relevant variables) vs. Merged Polarization and Work Data for Senate (relevant variables)

Statistical Methods

The methods conducted to reach our analysis consisted of linear regression models with control variables and fixed effects. We also performed an initial base linear regression, with no considerations, to effectively compare the different models and their results to one another. It remains evident that our results are in terms of log to visualize and compare a rational depiction of outturn as well.

The first form of analysis is descriptive, in which it only considers potential confounding variables to ensure we can conclude an accurate depiction of a significant relationship between our two variables. We took "Average Bills Introduced Per Member" into consideration, as a control variable, since each Congressional member proposes various numbers of bills that could vastly differ from one another. This alone has the potential to affect both polarization and each chamber of Congress in their legislative productivity, influencing our results into misleading interpretations when left alone.

The second form of analysis considers fixed effects, in which the contrasting natures of the two chambers are taken into account. As it was indicated earlier, the House of Representatives varies tremendously from the Senate in terms of the number of bills introduced, the number of bills passed, and the number of days in session. Since this remains the case in our study, we must run separate linear regressions on the two chambers to control for fixed effects. If we were to run linear regressions of both houses at the same time, the results may yield skewed and inaccurate results of a causal or non-causal relationship. The separation of Congress into two different regressions ensures clarity and distinction in our linear regression results. Our control variable "Average Bills Introduced Per Member" can also act as a fixed effect variable for the

experiment as this variable also varies in nature between each member in each respective house of Congress.

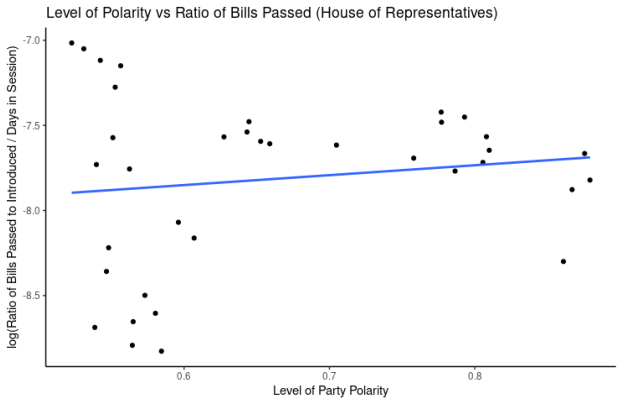
Results

The first point of the experiment is a linear regression model without any factors taken into account. Without any controls in the regression, a one unit increase in polarization in the House of Representatives is associated with a 1.789 increase in legislative productivity measure. The unit for increase in polarization is scaled to represent an increase in the difference in party means, taken as an exponential of the logarithm means. The resulting regression table for the House signifies a large p-value with the lack of asterisk on the 0.582 coefficient, indicating insignificant findings as the p-value must be less than 0.05 to be considered significant. As such, this linear regression justifies an insignificant relationship between polarization and legislative productivity in the House. Contrastingly, the relationship between polarization and legislative productivity in the Senate was discovered to be significant from this initial model. Without any controls, the regression returned a one unit increase in polarization with a 0.006 increase in legislative productivity measure. The regression table also indicates this result is significant as the p-value is less than 0.01. Cross analyzing the charts of each chamber with their respective linear regression models, we can interpret either a positive or negative correlation between the two variables. The House has a slightly positive correlation between polarization and legislative productivity, while the Senate has a negative correlation between the two variables. Despite this correlation of variables, the base results do not accurately depict a clear picture of the kind of relationship that exists between polarization and legislative productivity. Therefore, there needs to be other linear regressions conducted that consider other variables and factors that could influence our initial results.

First, the confounding variables need to be controlled for to promote accurate associations of a relationship between the variables. We controlled for "Average Bills Introduced Per Member" in the linear regression for both houses. The model for the House resulted in a one unit increase in polarization that is associated with a 0.093 increase in legislative productivity measure. The p-value also suggests that this result is significant since it is marked in the regression table to be less than 0.01. As such, we can interpret an associative relationship between polarization and legislative productivity in the House of Representatives when controlled for confounding variables. The model for the Senate demonstrates a one unit increase in polarization that is associated with a 0.003 increase in productivity measure. The p-value also suggests this result be significant since it is remarked as less than 0.01 in the regression table. Based on this analysis, we can infer an association between polarization and legislative productivity in the Senate.

Second, the fixed effects need to be anticipated in the next linear regression model. One of the fixed effects was already accounted for by separating the houses into different regressions. The other fixed effect variable we considered was the "Average Bills Introduced Per Member." When controlling the fixed effect variable, the House regression yielded a one unit increase in polarization associated with a 0.956 increase in legislative productivity measure. The p-value in this advanced model suggests our results are significant as it remains to be less than 0.01. When we analyzed the Senate with controlled fixed effects, our results indicated a one unit increase in polarization is associated with a 0.979 increase in productivity measure. The p-value in this model, however, is established to be insignificant as the table suggests it is less than 0.1. With

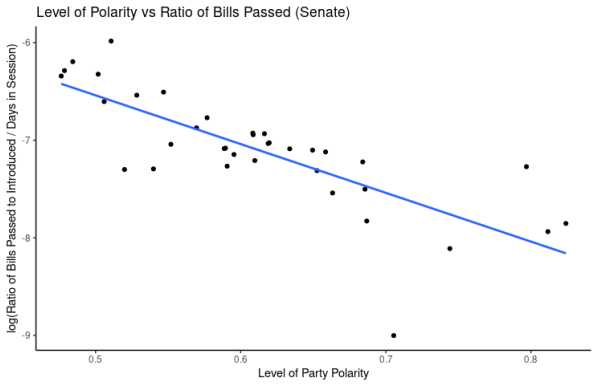
this outturn in mind, we cannot conclude an association or causal relationship between polarization and legislative productivity in the Senate.



Polarization on Productivity (House of Representatives)

	Dependent variable:	
	log(Ratio of Bill Introduced to Bills Passed / Total Days in Session)	
	Without Control	With Control
	(1)	(2)
Level of Polarization	0.582	-2.374***
	(0.707)	(0.585)
AvgBillsIntroducedPerMember		-0.044***
		(0.006)
Constant	-8.200***	-5.190***
	(0.475)	(0.494)
Observations	36	36
R^2	0.020	0.640
Adjusted R^2	-0.009	0.619
Residual Std. Error	0.505 (df = 34)	0.311 (df = 33)
F Statistic	0.678 (df = 1; 34)	29.382*** (df = 2; 33)
Note:		*p<0.1; **p<0.05; ***p<0.01

Regression Table for House



Polarization on Productivity (Senate)

	Dependent variable:	
	log(Ratio of Bill Introduced to Bills Passed / Total Days in Session)	
	Without Control	With Control
	(1)	(2)
Level of Polarization	-4.996***	-5.627***
	(0.702)	(0.760)
AvgBillsIntroducedPerMember		-0.021*
		(0.011)
Constant	-4.042***	-2.869***
	(0.434)	(0.765)
Observations	36	36
R^2	0.599	0.636
Adjusted R^2	0.587	0.614
Residual Std. Error	0.377 (df = 34)	0.365 (df = 33)
F Statistic	50.697*** (df = 1; 34)	28.802*** (df = 2; 33)
Note:		*p<0.1; **p<0.05; ***p<0.01

Regression Table for Senate

Conclusion

Based on the results, we can infer a causal relationship between polarization and the productivity of legislation in the House of Representatives when controlling for confounders and fixed effects. However, we cannot definitively infer a causal relationship between the two variables in the Senate, even with controls, due to the insignificance established in the p-value. This research is important as it represents the efficiency of the United States Congress. Since polarization throughout the country has increased, the citizens of the US now have more tension with one another. This tension is not just in beliefs, but also in perspective on current events on the world stage. Naturally, the members of Congress will reflect their districts and states as they will be elected based on representation. Knowing that more polarization leads to slower legislative processing may affect how fast the US can respond to a given issue. It could fundamentally change the operation of the United States and how it appears as a global power to other countries. This could also be used as a factor for voters and how they may want to think in electing representatives for the House and Senate.

Works Cited

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