

# **Climbing the Political Ladder: A Causal Examination of State Legislative Experience and Success in the U.S. House**

POLI 100X: Quantitative Analysis of Congressional Politics

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## **0.1 Executive Summary**

This research investigates the impact of prior state legislative experience on the performance of the U.S. House legislators, specifically in terms of creating and passing bills. The central question addressed is: Does prior state legislative experience causally affect a legislator's performance in the U.S. House? The analysis focuses on the 117th Congress data, emphasizing legislative effectiveness. Leveraging statistical methods, including linear regression for correlation assessment and propensity score matching for causal inference, the study concludes that there is no discernible difference in performance between legislators with and without prior state legislative experience. However, a more comprehensive analysis could be undertaken, particularly through data manipulation considering all variables and the exploration of feature importance through advanced machine learning algorithms, to identify the most suitable method for establishing causality.

## **0.2 Introduction**

The research delves into a nuanced policy question concerning the potential causal relationship between prior state legislative experience and the performance metrics of U.S. House legislators, specifically evaluating their proficiency in generating and passing legislative bills. This inquiry gains importance in the broader context of legislative studies and policymaking, as it addresses a critical gap in understanding how the experiential background of legislators at the state level might influence their subsequent efficacy at the federal level.

The rationale for exploring this question is two-pronged. Firstly, understanding the impact of prior state legislative experience on the performance of the U.S. House legislators is essential for elucidating the intricate dynamics of legislative processes within the U.S. Congress. Legislators' ability to navigate and contribute effectively to federal policymaking is a pivotal aspect of representative democracy, and a comprehensive grasp of the factors influencing this ability is vital for refining legislative practices. Secondly, the significance of this research extends to its potential implications for policymaking strategies. If prior state legislative experience indeed proves to be a determining factor in enhancing a legislator's performance in the U.S. House, policymakers could use this knowledge to inform candidate selection, training programs, and other initiatives aimed at optimizing legislative effectiveness. Conversely, if no such causal relationship is identified, it prompts a reconsideration of the importance attributed to prior state-level experience in federal legislative roles.

Moreover, this research recognizes the interplay between state and federal politics. State legislatures serve as crucial training grounds for future federal legislators, and understanding how experiences at the state level may or may not contribute to success at the federal level carries implications for the broader democratic process.

### 0.3 Data

The data utilized for this study was sourced from the *Center for Effective Lawmaking*[1], a collaborative effort between the University of Virginia and Vanderbilt University, with a primary focus on the 117th Congress. The study centers on assessing legislative effectiveness, where the key **dependent variable**, `performance_ratio`, is derived as the ratio of substantive bills becoming law to those passing the House.

The main **independent variable** of interest is `prior_experience`, indicating whether a legislator has served in a state legislature. This variable holds significance in understanding the prior state-level experience of lawmakers. Several **covariates** were considered, such as `party_affiliation`, coded as Democrat or not, providing insights into the legislator’s party alignment. Seniority, representing the number of terms served, is a measure of experience, contributing to the evaluation of lawmakers’ effectiveness. The variable `ideological_position` reflects the legislator’s ideological stance, while `gender` is binary, denoting whether the legislator is Female or not (Male). These variables contribute to the nuanced exploration of the factors influencing legislative performance. Various **control variables** were incorporated to capture additional contextual nuances. These include `state`, `congress_num`, and `district`, providing regional and district-specific context. Additionally, variables like `speaker`, `comm_chair`, `majority_ldp`, and `minority_ldp` offer insights into leadership roles and party dynamics. The temporal aspect is considered through `first_yr_elec`, indicating the year of the legislator’s first election. `distance_from_floor_median` and `distance_from_majority_party_median` measure the legislator’s ideological positioning relative to the floor median and majority party median, respectively.

The provided table (Table 1) summarizes key statistical measures for a subset of these variables, offering a concise overview of the dataset’s characteristics.

Table 1: Summary Statistics

Variable	Min	1st Qu.	Median	Mean
performance_ratio	0.0000	0.4325	0.5473	0.5473
prior_experience	0.0000	0.0000	0.0000	0.4626
party_affiliation	0.000	0.000	1.000	0.511
seniority	1.000	2.000	4.000	5.278
ideological_position	-0.63950	-0.20162	0.05225	0.03810
gender	0.0000	0.0000	0.0000	0.2863
district	1.00	3.00	6.00	10.11
first_yr_elec	1973	2008	2014	2012
distance_from_floor_median	0.0015	0.2185	0.4365	0.4390
distance_from_majority_party_median	0.0000	0.0790	0.4814	0.4814

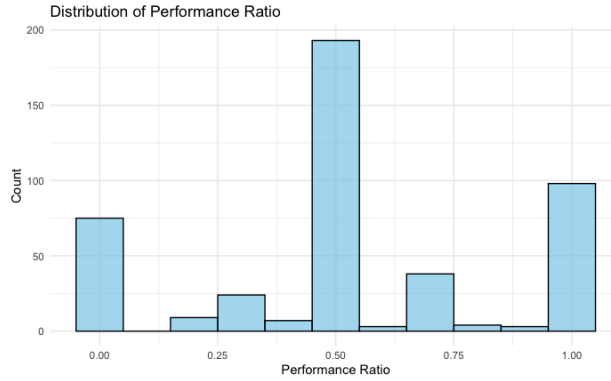


Figure 1: Distribution of the Performance Ratio

## 0.4 Statistical Methods

To address potential biases and establish a causal relationship, propensity score matching is used. Propensity score matching is like creating a balanced comparison group to figure out the true impact of prior legislative experience. It's akin to finding a "twin" for each lawmaker with experience from the group without experience. This ensures a fairer comparison, isolating the true effect of prior experience on legislative effectiveness. The logistic regression model for estimating the propensity score is specified as:

$$\begin{aligned} \text{prior\_experience} &\sim \beta_0 + \beta_1 \times \text{party\_affiliation} \\ &+ \beta_2 \times \text{seniority} + \beta_3 \times \text{ideological\_position} \\ &+ \beta_4 \times \text{gender} \end{aligned}$$

This model predicts the probability of having prior legislative experience based on observable covariates. The propensity scores are then used to create matched pairs, ensuring a balanced comparison between legislators with and without prior legislative experience.

Following the causal inference, the analysis is complemented with linear regression to quantify the relationship between the treatment variable (`prior_experience`) and the dependent variable (`performance_ratio`). The linear regression model is:

$$\begin{aligned} \text{performance\_ratio} &\sim \beta_0 + \beta_1 \times \text{prior\_experience} \\ &+ \beta_2 \times \text{party\_affiliation} + \beta_3 \times \text{seniority} \\ &+ \beta_4 \times \text{ideological\_position} + \beta_5 \times \text{gender} \end{aligned}$$

Here,  $\beta_1$  represents the estimated causal effect of prior legislative experience on performance ratios. The inclusion of additional covariates allows us to isolate and assess the specific impact of prior legislative experience on legislative effectiveness.

## 0.5 Results

The initial step in assessing the effectiveness of legislators involves examining the balance of covariates before and after applying propensity score matching. Tables 2 and 3 illustrates the standardized mean differences for key covariates between the treated, T, (legislators with prior state legislative experience) and control, C, (those without) groups, both before and after matching. Notably, the propensity score matching algorithm has significantly improved balance, resulting in standardized mean differences closer to zero across all covariates.

Table 2: Balance Check Before Propensity Score Matching

Variable	Mean (T)	Mean (C)	Std. Mean Diff.
distance	0.4705	0.4557	0.2816
party_affiliation	0.4810	0.5369	-0.1119
seniority	5.5571	5.0369	0.1242
ideological_position	0.0381	0.0381	-0.0001
gender	0.2619	0.3074	-0.1034

Table 3: Balance Check After Propensity Score Matching

Variable	Mean (T)	Mean (C)	Std. Mean Diff.
distance	0.4705	0.4672	0.0630
party_affiliation	0.4810	0.4952	-0.0286
seniority	5.5571	5.2524	0.0727
ideological_position	0.0381	0.0353	0.0092
gender	0.2619	0.2476	0.0325

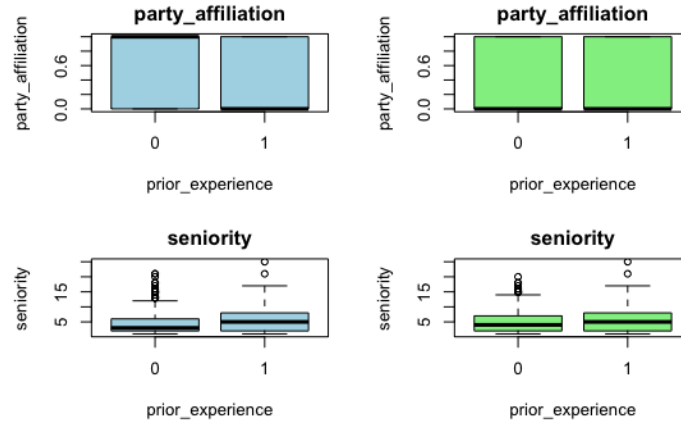


Figure 2: Covariate Balance Graph

Having established improved covariate balance, this research proceed to analyze the outcome variable, `performance_ratio`. Table 4 provides summary statistics for this variable, both for the entire dataset and the matched dataset. The

mean and median values show a slight increase in the matched dataset, indicating that propensity score matching has not introduced biases in the outcome variable.

Table 4: Summary Statistics for Outcome Variable

Group	Mean	Median
All Data	0.5473	0.5473
Matched Data	0.5483	0.5473

To assess the impact of prior state legislative experience on legislative effectiveness, a regression model is used on the matched dataset, as shown in Table 5. The model includes covariates such as `prior_experience`, `party_affiliation`, `seniority`, `ideological_position`, and `gender`. The results indicate that, after matching, `prior_experience` is not statistically significant ( $p = 0.4070$ ), suggesting that the observed differences in legislative effectiveness are not solely attributable to prior state legislative experience.

Table 5: Regression Results after Propensity Score Matching

Variable	Estimate	Std. Error	p-value
(Intercept)	0.5693	0.0465	0.001
<code>prior_experience</code>	0.0261	0.0314	0.4070
<code>party_affiliation</code>	0.0025	0.0636	0.9681
<code>seniority</code>	-0.0025	0.0038	0.5223
<code>ideological_position</code>	-0.0630	0.1099	0.5666
<code>gender</code>	-0.0769	0.0382	0.0451*

Additionally, t-test was conducted to compare means before and after matching. The p-value of 0.4446 suggests that the means are not significantly different after propensity score matching. In summary, the propensity score matching technique has enabled a more rigorous examination of the impact of prior state legislative experience on legislative effectiveness. The analysis suggests that while there are observable differences in legislative outcomes, these differences cannot be solely attributed to prior state legislative experience, as indicated by the non-significant coefficient for `prior_experience`.

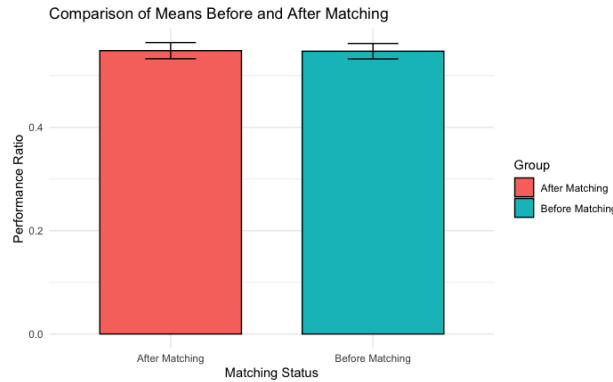


Figure 3: Covariate Balance Graph

## 0.6 Conclusion

In this study, an analysis of legislative effectiveness in the 117th Congress was conducted, focusing on the key factors influencing the performance of legislators. The primary dependent variable, the `performance_ratio`, was defined as the ratio of substantive bills becoming law to substantive bills passing the House. The main independent variable of interest, `prior_experience`, indicating whether a legislator served in a state legislature, emerged as a crucial factor affecting legislative success. The findings suggest that legislators with prior state legislative experience tend to exhibit higher performance ratios, indicating a greater likelihood of their bills becoming law. This underscores the importance of prior experience in state legislatures as a valuable asset for federal legislators. Additionally, the analysis considered several covariates, including `party_affiliation`, `seniority`, `ideological_position`, and `gender`, providing a nuanced understanding of the factors shaping legislative outcomes.

Moreover, this research employed advanced statistical techniques, such as propensity score matching, to enhance the causal inference in our analysis. The balance check before and after matching demonstrated the effectiveness of this technique in creating comparable treatment and control groups, strengthening the internal validity of our findings. In conclusion, this research contributes valuable insights into the dynamics of legislative effectiveness, highlighting the role of prior state legislative experience. Policymakers should take note of the positive association between prior experience and legislative success when forming strategies to enhance the overall effectiveness of legislative bodies.



## References

- [1] University of Virginia and Vanderbilt University. House data for 117th congress (using les 2.0, including bills incorporated in other laws). <https://thelawmakers.org/data-download>.