

# Minority Legislators (Co)Sponsor Differently From White Legislators

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## Introduction

- Currently, Congress is at its highest peak of racial diversity—with 27% of legislators identifying as non-white. As it continues to diversify, it is important to understand how racial identity influences representation and how political institutions shape non-roll call behavior for legislators of color.
- Research Question: Do racial minority legislators (co)sponsor differently from White ones?
- My contributions:
  - Methodological - I use a novel empiric strategy that collectively draws more credible causal inference than previous works that study bill (co)sponsorship.
  - Substantive - I draw from several studies of representation to lay out a theoretical framework of strategic behavior that explains the relationship between race and ethnicity and non-roll call position-taking behavior.
- Theory: *Strategic Minority Legislating* - Racial minority legislators are unable to sponsor much legislation due to exacerbated institutional marginalization. As a result, they intentionally focus their electoral resources on cosponsoring a high amount of legislation to remain competitive and build connections with colleagues.
- Hypotheses:
  - H1 - Legislators of color will, on average, sponsor less legislation than White legislators.
  - H2 - Legislators of color will, on average, cosponsor more legislation than White legislators.

## Research Design

- To answer my question, I look at congressional districts where:
  - Minority congressmembers replaced white legislators (treatment group)
  - White congressmembers replaced white legislators (placebo group A)
  - Minority congressmembers replaced minority legislators (placebo group B)
- I then Compare bill sponsorship and cosponsorship trends between these three groups to congressional districts where:
  - White congressmembers never left office (control group for treatment group and placebo group A)
  - Minority congressmembers never left office (control group for placebo group B).

## Method: Synthetic Difference-in-Differences (SDID)

- Instead of relying on existing congressional districts to use as controls, I construct counterfactual control congressional districts where minority/non-minority legislators never left office.
- SDID estimator (Arkhangelsky et al. 2021) calculates unit ( $\hat{\omega}_{sdid}$ ) and time ( $\hat{\lambda}_t^{sdid}$ ) weights that assist in the construction of a counterfactual whose control units' outcomes are, on average, parallel to the pre-treatment trends of the treated units' outcomes.
- These weights are then inserted into a two-way fixed effects regression model to estimate the average treatment effect of having a minority legislator in office ( $\tau$ ):

$$(\hat{\tau}_{sdid}, \hat{\mu}, \hat{\alpha}, \hat{\beta}) = \arg \min_{\tau, \mu, \alpha, \beta} \left\{ \sum_{i=1}^N \sum_{t=1}^T (Y_{it} - \mu - \alpha_i - \beta_t - W_{it}\tau)^2 \hat{\omega}_i^{sdid} \hat{\lambda}_t^{sdid} \right\} \quad (1)$$

## Method: Calculation of Unit and Time Weights

**Unit Weights:** Unit-specific weights are chosen via a two-step process.

- Estimator computes the optimal regularization parameter ( $\zeta$ ) to match the size of an average single period outcome change ( $\Delta_{it}$ ) for all control units in the pre-treatment period.
- Regularization parameter is then implemented to the following objective function:

$$(\hat{\omega}_0, \hat{\omega}^{sdid}) = \arg \min_{\omega_0 \in \mathbb{R}, \omega \in \Omega} \ell_{unit}(\omega_0, \omega)$$

where

$$\ell_{unit}(\omega_0, \omega) = \sum_{t=1}^{T_{pre}} \left( \omega_0 + \sum_{i=1}^{N_{co}} \omega_i Y_{it} - \frac{1}{N_{tr}} \sum_{i=N_{co}+1}^N Y_{it} \right)^2 + \zeta^2 T_{pre} \|\omega\|_2^2, \text{ and}$$

$$\Omega = \{ \omega \in \mathbb{R}_+^N : \sum_{i=1}^{N_{co}} \omega_i = 1, \omega_i = N_{tr}^{-1} \text{ for all } i = N_{co} + 1, \dots, N \}$$

- Regularization ( $\zeta$ ) term serves as a penalty in order to increase weight dispersion—leading to more unique  $\hat{\omega}_{sdid}$  values (Arkhangelsky et al. 2021).
- The Euclidean norm ( $\|\omega\|_2$ ) leads to a vector of non-negative weights and an intercept ( $\omega_0$ ) term that grants more flexibility when matching unexposed pre-trends to the exposed ones (Clarke et al. 2023).

**Time Weights:** Time weights are found by having the estimator minimize the following objective function:

$$(\hat{\lambda}_0, \hat{\lambda}^{sdid}) = \arg \min_{\lambda_0 \in \mathbb{R}, \lambda \in \Lambda} \ell_{time}(\lambda_0, \lambda)$$

where

$$\ell_{time}(\lambda_0, \lambda) = \sum_{i=1}^{N_{co}} \left( \lambda_0 + \sum_{t=1}^{T_{pre}} \lambda_t Y_{it} - \frac{1}{T_{post}} \sum_{t=T_{pre}+1}^T Y_{it} \right)^2 \text{ and}$$

$$\Lambda = \{ \lambda \in \mathbb{R}_+^T : \sum_{t=1}^{T_{pre}} \lambda_t = 1, \lambda_t = T_{post}^{-1} \text{ for all } t = T_{pre} + 1, \dots, T \}$$

## Method: Variance Estimation and Model Inference

- Few treated units complicate asymptotically valid inference.
- Method propose three variance estimation methods for SDID point estimates: placebo permutations, **block bootstrapping**, and jackknife.
- SDID estimator is asymptotically normal and zero-centered.
- Allows the construction of CIs for point estimates using:  $\tau \in \hat{\tau}^{sdid} \pm z_{\alpha/2} \sqrt{\hat{V}_\tau}$
- Where  $z_{\alpha/2}$  is the inverse normal density function, and  $\hat{V}_\tau$  is the estimated variance.
- SDID takes block bootstrap approach to generate samples which are then used to estimate SEs.

## References

- Dmitry Arkhangelsky, Susan Athey, David Hirshberg, Guido Imbens, and Stefan Wager. Synthetic difference-in-differences. *American Economic Review*, 111(12):4088–4118, 2021.
- Damian Clarke, Domingo Pailaño, Susan Athey, and Guido W. Imbens. Synthetic difference-in-differences estimation. Technical report, IZA Discussion Paper No. 15907, 2023.

## Application of SDID with Block A of Treatment Group

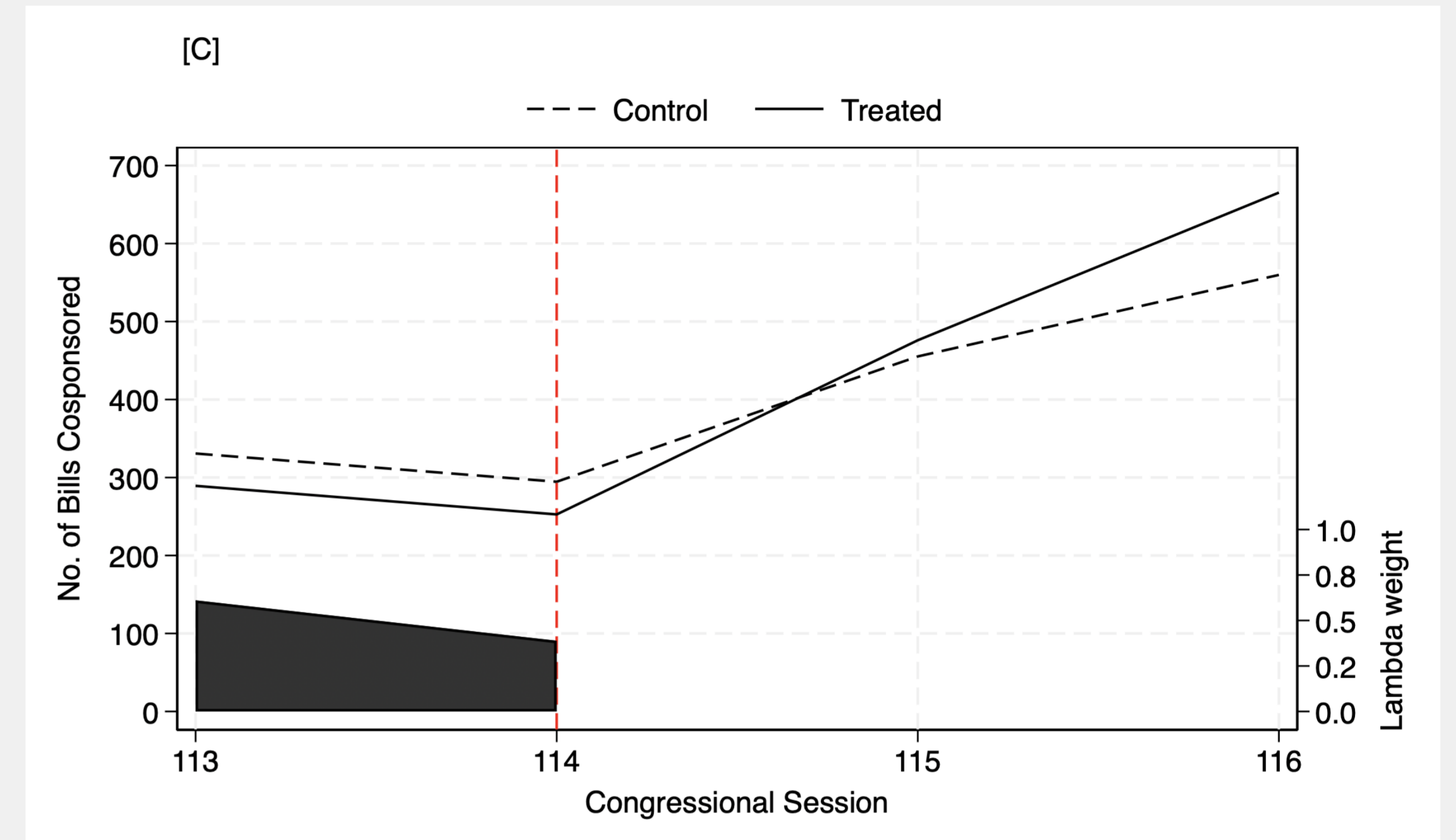


Figure 1. SDID Bill Cosponsorship Trends (Minority Legislators)

## Weighted SDID Estimate Results and Conclusion

	Sponsorship	Cosponsorship
Treatment Group (Minority replacing non-minority)	-10.93*** (3.50)	91.22*** (28.58)
Treated Districts	9	9
Observations	324	324
Placebo Group A	-15.95 (11.38)	57.07 (104.59)
Treated Districts	9	9
Observations	324	324
Placebo Group B	-3.18 (5.70)	-72.00 (46.53)
Treated Districts	10	10
Observations	240	240

Note: Bootstrap standard errors in parentheses are based on 1,000 replications.

\* p<0.10, \*\*p<0.05, \*\*\*p<0.01

Table 1. SDID weighted estimation results for legislative activity

- On average, incoming minority legislators sponsored about 11 fewer bills than the non-minorities they replaced, whereas they cosponsored about 91 more pieces of legislation than the legislators they replaced.
- When looking at both placebo groups, results for both sponsorship and cosponsorship do not suggest that there was an overall difference in behavior among similar groups (White replacing White and Minority replacing Minority).
- Results of this analysis suggest that minority legislators are limited in the kind of influence they can exert through bill sponsorship and cosponsorship.
- Where sponsorship is often associated with a form of agenda-setting, cosponsorship is associated with a form of legislative support, implying minority legislators, as a collective, serve more of a supportive role in the dynamic of decision-making on the floor.