INSTITUTE for REPLICATION

No. 57
I4R DISCUSSION PAPER SERIES

A Comment on Campaign Contributions and Roll-Call Voting by Grier, Grier and Mkrtchian (2023)

Harry He

Tereza Petrovičová

August 2023

I4R Discussion Paper Series

I4R DP No. 57

A Comment on Campaign Contributions and Roll-Call Voting by Grier, Grier and Mkrtchian (2023)

Harry He[1], Tereza Petrovičová[1]

[1]University of California, San Diego/USA

August 2023

E-Mail: joerg.peters@rwi-essen.de
RWI – Leibniz Institute for Economic Research
Hohenzollernstraße 1-3
45128 Essen/Germany
www.i4replication.org

ISSN: 2752-1931

A comment on Campaign Contributions and Roll-Call Voting by Grier, Grier and Mkrtchian (2023)*

Harry He and Tereza Petrovičová

August 6th, 2023

Abstract

In their study, Grier et al. (2023) explore the causal relationship between campaign contributions and roll-call voting. Their analysis focuses on the influence of campaign contributions on two specific anti-sugar votes conducted in 2013 and 2018. The authors identify a substantial increase in inflation-adjusted sugar contributions from the sugar industry to incumbent politicians between these two voting events.

The aim of our research is to replicate and validate the authors' main models. In addition to cross-platform replication, we conduct several robustness checks to further examine the reliability of their findings. These include (1) clustering the standard errors, (2) utilizing an Ordinary Least Squares (OLS) model instead of the authors' logistic regression, and (3) altering the dependent variable to represent the change in the vote from 2013 to 2018. Our results largely confirm the authors' findings and reveal additional insights regarding the money buys vote hypothesis.

*Authors: Harry He: University of California San Diego. E-mail: zih028@ucsd.edu. Tereza Petrovičová: University of California San Diego tpetrovicova@ucsd.edu. The authors declare no ethical issues or conflicts of interest in this research.

1 Introduction

Grier et al. (2023) examine the causal relationship between campaign contributions and roll-call voting, focusing on the impact of campaign contributions of sugar corporations on the votes of the United States House of Representatives. The study explores two instances of anti-sugar votes: one in 2013 and another in 2018. In 2013, the anti-sugar bill was introduced but failed to pass. Five years later, in 2018, a similar bill was brought to vote again, but it faced an even greater defeat. During the five-year period between the two votes, the authors observe a significant increase in campaign contributions from the sugar industry to incumbent politicians. In fact, the contributions rose by over 50% during this time frame. This unique setting motivates Grier et al. (2023) to go beyond existing research and identify causally the correlation between campaign contributions and roll-call voting.

In the present paper, we used the authors' published data. The original dataset comes from GovTrack.us, which documents the votes of all bills made by the Senate and the House. In terms of reproducibility, we managed to successfully reproduce the author's main models and figures. We only encountered a minor issue with the Congress members' last names, however, this did not affect the results.

Turning to sensitivity analysis, we test the robustness of the results (1) using clustered standard errors, (2) conducting an OLS instead of the author's logit, and (3) altering the dependent variable to be the change in the vote from 2013 to 2018. We find that our robustness checks align with the authors' results.

2 Reproducibility

We find a few minor coding or data-wrangling errors in the authors' dataset. The spelling of several Congress members' last names is not consistent. For instance, Cardenas is once spelled as "Cárdenas" and other times as "Cardenas." This did not affect the analyses and results, since the authors correctly coded the 'both' variable indicating whether the same representative voted on both bills in the same district despite occasional mismatches in their names recorded.

3 Robustness Reproduction and Replication

We now turn our attention to our our robustness reproduction and replication exercises. We are undertaking a cross-platform replication study aiming to investigate the causal effect proposed by the authors. In contrast to the authors' use of STATA, our replication utilizes R as the statistical software. By employing this alternative platform, we aim to replicate and validate the claimed causal effect in a different statistical environment.

We first reproduce the authors' two main models and find highly similar results. We first rerun the authors' models with robust standard errors clustered at the district level. Given the authors' causal claim on the relationship between sugar contribution and voting behaviors, we then run OLS models using the same model specification. Finally, we design a fixed effects model where the dependent variable is the change in roll-call votes on the anti-sugar bills. The rationale behind this decision is to examine whether increases in sugar contributions lead to changes in representatives' voting behaviors. This is a test for the hypothesis that money buys votes and helps address some of the endogeneity concerns the authors identify.

3.1 Cluster Robust Standard Errors

We first test the robustness of the results by using robust standard errors clustered at the district level. Results from the replication of the authors' models presented in their Table 1 and the robustness test are reported in our Table 1. Columns 1 and 3 include the district fixed effects and columns 2 and 4 include the incumbent fixed effects. In all four models, we are effectively filtering out observations where the representatives from the same district voted the same way in 2013 and 2018 as they can be perfectly predicted by the fixed effects. These observations are automatically dropped when reporting the number of observations in STATA but are kept in R, thereby resulting in a significantly larger number of observations in our results. The effective number of observations for model 1 and 3 is 186 and that for model 2 and 4 is 106. Their respective degrees of freedom are 84 and 44.

Table 1: Effects of Sugar Contributions on Voting for Sugar Reform Bills

	Dependent variable:			
	Voting in Favor of Sugar Reform			
	Robust SEs		Clustered SEs	
	(1)	(2)	(3)	(4)
Sugar contributions	−0.0006***	−0.0004**	−0.0006***	−0.0004**
	(<0.001)	(<0.001)	(<0.001)	(0.012)
ACU	0.202***	0.060	0.202***	0.060
	(<0.001)	(0.524)	(0.002)	(0.653)
Tenure	−0.297***	−1.433***	−0.297***	−1.433***
	(0.<0.001)	(<0.001)	(<0.001)	(0.004)
Poverty rate	2.190***	2.246**	2.190***	2.246
	(<0.001)	(0.020)	(0.006)	(0.101)
% w/ bachelor's degree	1.206*	0.592	1.206	0.592
	(0.061)	(0.199)	(0.186)	(0.365)
Median income	0.0001	0.001	0.0001	0.001
	(0.668)	(0.190)	(0.762)	(0.355)
% population > 65	−1.886**	−0.382	−1.886	−0.382
	(0.035)	(0.834)	(0.137)	(0.882)
Agriculture committee	−41.506***	−46.463***	−41.506***	−46.463***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
District FE	YES	NO	YES	NO
Incumbent FE	NO	YES	NO	YES
Observations	860	612	860	612
Log Likelihood	−32.912	−20.517	−32.912	−20.517
Akaike Inf. Crit.	951.824	669.034	951.824	669.034

Note: p-values are reported in parentheses *p<0.1; **p<0.05; ***p<0.01

3.2 First Difference Model

In their paper, the authors mention that causally identifying the positive correlation between interest group contributions and favorable votes is difficult because of the endogeneity concern. Interest groups may give politicians money to reward their support rather than attempt to sway their votes. Without knowing the politicians' existing level of support for certain bills or issues, it remains challenging to identify the causal effect. The authors contend that studying repeated voting patterns help address the endogeneity concerns, as the fixed effects models can wash out any time-invariant factors at the district level. While this model specification can alleviate some of the endogeneity concerns, it has two main shortcomings.

First, the model does not specifically examine changes in voting behaviors. Although the fixed effects filter out all observations where the representatives did not change their votes in 2013 and 2018, the model examines how representatives would have voted given levels of sugar contributions rather than how different levels of sugar contributions would have changed their votes. If we use a linear model, the first difference and fixed effects estimators would be numerically equivalent and then we would only be testing the serial correlation of the error terms. For logistic models given the binary distribution of the outcome variable, such numerical equivalence between the first difference and fixed effects estimators may no longer hold. The two models can yield different point estimators as well as standard errors. Since the outcome of interest is the change in voting behavior given interest group contributions, we believe that using the first difference estimator provides a meaningful alternative to test the theory and examine the actual changes in voting patterns. Second, assuming the models are causally identified, the authors can conclude that higher sugar contributions make politicians more likely to vote against sugar reform bills. We cannot, however, tell if the results are driven by the positive effect (giving politicians money can advance special interests) or the negative effect (taking money away from politicians can hurt special interests). To better address these concerns, we construct two first difference models where the dependent variables record whether politicians changed their votes from aye to no and from no to aye between 2013 and 2018. The rationale is that by comparing those who did and those who did not, we can test whether changes in levels of sugar contributions explain these changes in voting behaviors.

As the authors present in Table 2 of their paper, more politicians changed their

Table 2: Effects of Changes in Sugar Contributions on Changes in Voting Behaviors

	Dependent variable:	
	Vote Change	
	(1) Aye to No	(2) No to Aye
Difference in sugar contributions	0.0002***	−0.00003
	(0.010)	(0.432)
ACU	−0.047	0.125**
	(0.171)	(0.024)
Tenure	0.038	0.034
	(0.233)	(0.557)
Poverty rate	0.003	−0.563*
	(0.981)	(0.071)
% w/ bachelor's degree	0.051	0.234
	(0.533)	(0.166)
Median income	−0.0001	−0.00007
	(0.187)	(0.332)
% population > 65 years old	−0.046	0.210*
	(0.679)	(0.096)
Agriculture committee	16.743***	−0.799
	(<0.001)	(0.683)
State FE	YES	NO
Observations	146	154
Log Likelihood	−55.423	76.305
Akaike Inf. Crit.	192.847	−56.609

Note: p-values are reported in parentheses *p<0.1; **p<0.05; ***p<0.01

votes from aye to no (79) than from no to aye (14). If we limit to districts where there the same representative participated in both roll call votes, the numbers are 47 and 6, respectively. Clearly, the small number of cases of vote switching from no to aye is a cause for concern, so we focus our attention on cases of vote switching from aye to no. We also limit our sample to districts that had the same representative in 2013 and 2018 to better model the changes in voting behaviors. Results from our logistic regression with state fixed effects models are reported in Table 2. The coefficient for the explanatory variable, the difference in sugar contributions, is positive and significant in model 1. This lends further support to the author's findings and the theory that money buys votes. The coefficient for the explanatory variable in model 2 is negative but statistically insignificant. While the small number of observations with non-zero outcomes is a cause for concern and make us less confident to accept the null result, it is possible that taking money away from politicians do not elicit such a strong and predictable change in politicians' behaviors.

3.3 OLS Model

In addition to replicating the authors' logit model, we also employed a simpler Ordinary Least Squares (OLS) model to further investigate the relationship between sugar contributions and roll-call voting. Specifically, we conducted an OLS model with both district fixed effects and incumbent fixed effects.

In the OLS model with district fixed effects (model 1 in Table 3), we found a negative and statistically significant coefficient on sugar contributions, which is consistent with the findings reported by the authors. However, in the incumbent fixed effects model (model 2 in Table 3), we did not observe a statistically significant effect.

These results indicate that while the district fixed effects model supports the authors' findings, the incumbent fixed effects model does not provide strong evidence of a significant effect of sugar contributions on roll-call voting. These contrasting results highlight the importance of considering different modeling approaches and robustness checks to fully understand the relationship between campaign contributions and voting behavior.

3.4 Marginal Effects

We turn to replicate the authors' Figure 1, which highlights the marginal effects of sugar contributions on the likelihood of supporting sugar reform using the district fixed effects model. In our Figure 1, we successfully replicated the author's visualization, incorporating a 95% confidence interval. Instead of using the heteroskedasticity consistent robust standard errors, we plot the confidence intervals

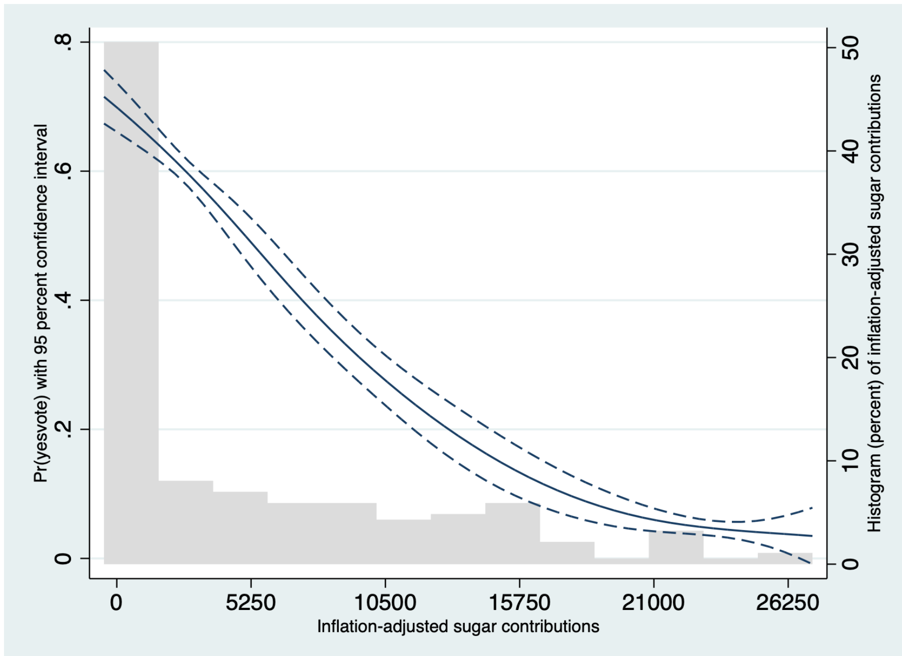
Table 3: Effects of Sugar Contribution on Voting for Sugar Reform Bills

	Dependent variable:	
	Vote in Favor of Sugar Reform	
	(1) District FE	(2) Incumbent FE
Sugar contributions	−0.00001***	−0.000004
	(0.001)	(0.320)
ACU	0.005***	0.004
	(0.008)	(0.234)
Tenure	−0.0005	−0.008
	(0.906)	(0.319)
Poverty rate	−0.0002	0.020
	(0.988)	(0.283)
% w/ bachelor's degree	−0.016	0.015
	(0.566)	(0.639)
Median income	−0.000001	0.000002
	(0.829)	(0.742)
% population > 65 years old	−0.052**	−0.037
	(0.037)	(0.229)
Agriculture committee	−0.186*	−0.195
	(0.096)	(0.234)
District FE	YES	NO
Incumbent FE	NO	YES
Observations	860	612
Adjusted R^2	0.623	0.679
Note: p-values are reported in parentheses		*p<0.1; **p<0.05; ***p<0.01

using the cluster-robust standard errors. The figure effectively demonstrates the impact of sugar contributions on the probability of voting in favor of sugar program reform. The solid line represents the estimated effects, while the dotted lines depict the 95% confidence intervals. Furthermore, the background of the figure includes a gray shading that represents the histogram of sugar contributions.

In Figure 1 we observe a negative trend where higher levels of sugar contributions are associated with an increased probability of voting in favor of the sugar reform. However, it is important to note that the sugar reform being discussed here is actually against the sugar industry. Therefore, this negative trend indicates that

Figure 1: Effect of Sugar Money on Voting for Sugar Reform

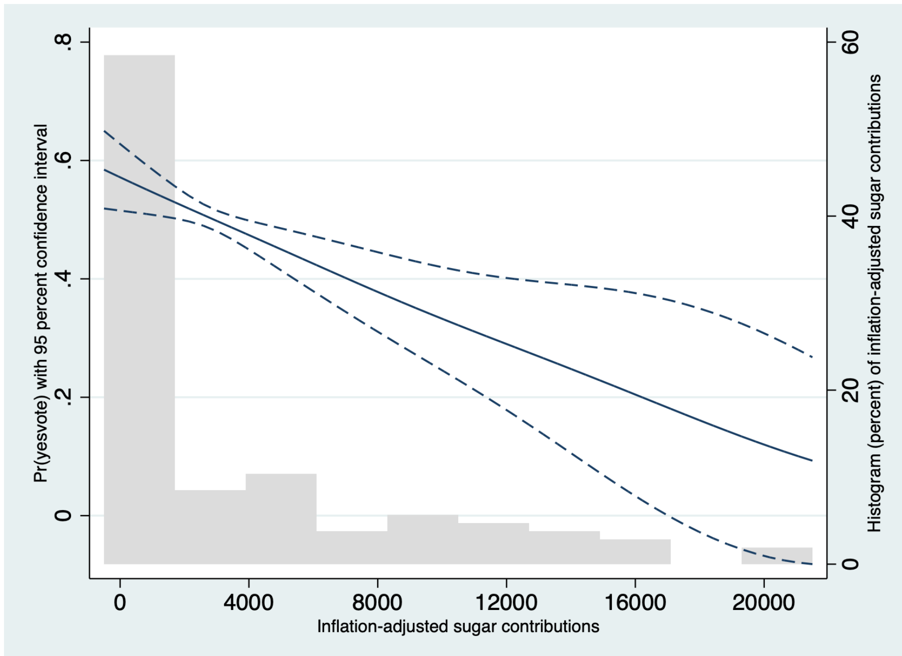


a greater amount of contributions corresponds to a higher likelihood of voting in favor of the sugar industry.

To better understand the incumbent fixed effects model, we also present the marginal effects plots in Figure 2. The incorporation of incumbent fixed effects is done in models 2 and 4, as shown in Table 1. After limiting the sample to only districts without a change of representatives, the marginal effects plot tell a similar story, albeit with wider margins or error. Increasing sugar contributions clearly exhibit a negative impact on the probability that a given representative will vote in favor of the anti-sugar reform bill.

As an additional robustness test, we generate a new marginal effects plot, presented in Figure 3, using the fixed effects model outlined in Table 2. In this case, the dependent variable represents the change in votes from "yes" to "no," indicating a shift from supporting the anti-sugar reform to opposing it. The results from this analysis align with the findings depicted in Figures 1 and 2, as they indicate that increased sugar contributions for a given politician are associated with a higher probability that such individual will switch vote from supporting the anti-sugar bill in 2013 to voting against the one in 2018.

Figure 2: Effect of Sugar Money on Voting for Sugar Reform (Same Politicians)



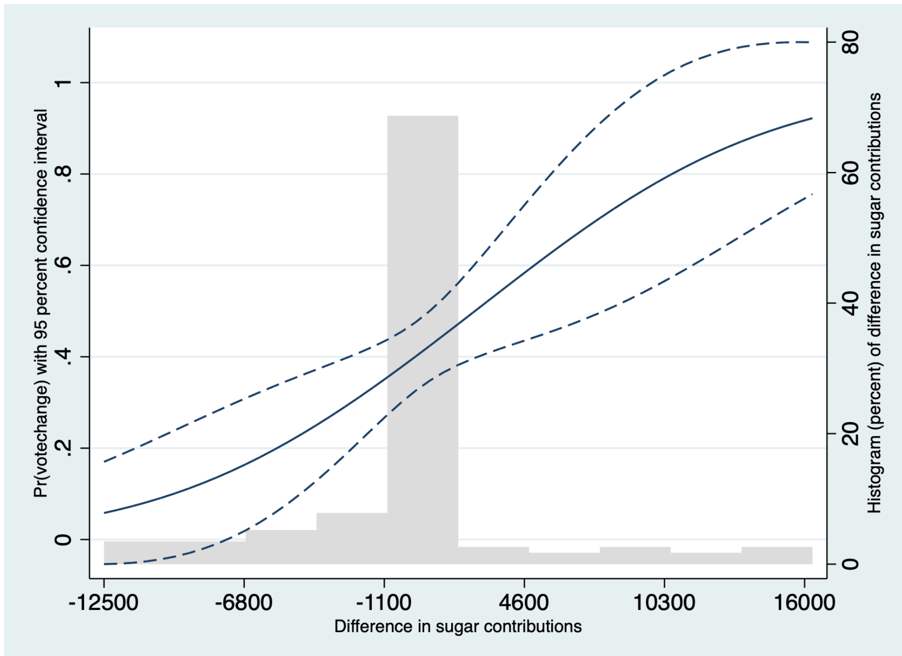
In summary, our analysis of the marginal effects plots consistently supports the trend emphasized by the authors: higher levels of sugar contributions are linked to a decreased likelihood of voting in favor of the anti-sugar reform. These findings align with the arguments put forth by the authors regarding the impact of increased campaign contributions on voting behavior.

4 Conclusion

In conclusion, our reproduction and replication study aimed to validate the causal relationship between campaign contributions and roll-call voting as investigated by Grier et al. (2023). By reproducing their main models and conducting robustness checks, we have confirmed their central finding of campaign contributions from the sugar industry causing a significant decrease in the likelihood of Congress members voting in favor of the anti-sugar bill.

Furthermore, our analysis expanded on their work by employing additional methodologies such as clustering standard errors, utilizing an OLS model, and altering the dependent variable. Despite some variations in the results, our replication efforts consistently supported the authors' main claim regarding the impact of cam-

Figure 3: Effect of Sugar Money on Voting for Sugar Reform



paign contributions on roll-call voting.

However, it is crucial to acknowledge the limitations of our replication study. One notable limitation is that we relied on the data reported by the authors instead of obtaining the raw data directly from a reliable source like GovTrack.us. Conducting a deep replication with access to the raw data would enhance the transparency and reliability of our findings.

Moreover, future studies could contribute to the literature by testing the authors' hypothesis using new data. However, obtaining such data may pose challenges as the authors benefited from a unique circumstance where two similar bills were passed, allowing for a comparative analysis of roll-call voting. Nonetheless, pursuing alternative datasets or exploring novel research designs would advance our understanding of the mechanisms through which campaign contributions influence voting outcomes.

Finally, by successfully replicating their findings, our study adds to the body of literature on campaign finance and its impact on political decision-making. We provide additional evidence that supports the existence of a causal relationship between campaign contributions and roll-call voting, emphasizing the significance of replicability and rigorous validation in social science research.

References

Grier, K., Grier, R. and Mkrtchian, G.: 2023, Campaign contributions and roll-call voting in the u.s. house of representatives: The case of the sugar industry, *American Political Science Review* **117**(1), 340–346.