ECONSTOR
*Make Your Publications Visible.*

A Service of

ZBW Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Villalobos, Laura; Caviglia-Harris, Jill; Jayalath, Tharaka

**Working Paper**

# Replicating: "Playing Politics with Environmental Protection: The Political Economy of Designating Protected Areas"

I4R Discussion Paper Series, No. 73

**Provided in Cooperation with:**
The Institute for Replication (I4R)

*Suggested Citation:* Villalobos, Laura; Caviglia-Harris, Jill; Jayalath, Tharaka (2023) : Replicating: "Playing Politics with Environmental Protection: The Political Economy of Designating Protected Areas", I4R Discussion Paper Series, No. 73, Institute for Replication (I4R), s.l.

This Version is available at:
https://hdl.handle.net/10419/278026

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

INSTITUTE for REPLICATION

No. 73
I4R DISCUSSION PAPER SERIES

# Replicating "Playing Politics with Environmental Protection: The Political Economy of Designating Protected Areas"

Laura Villalobos

Jill Caviglia-Harris

Tharaka Jayalath

September 2023

INSTITUTE for REPLICATION

I4R DISCUSSION PAPER SERIES

I4R DP No. 73

# Replicating: "Playing Politics with Environmental Protection: The Political Economy of Designating Protected Areas"

**Laura Villalobos[1], Jill Caviglia-Harris[1], Tharaka Jayalath[2]**

*[1]Salisbury University, Salisbury/USA*
*[2]University of Saskatchewan, Saskatoon/Canada*

SEPTEMBER 2023

Any opinions in this paper are those of the author(s) and not those of the Institute for Replication (I4R). Research published in this series may include views on policy, but I4R takes no institutional policy positions.

I4R Discussion Papers are research papers of the Institute for Replication which are widely circulated to promote replications and meta-scientific work in the social sciences. Provided in cooperation with EconStor, a service of the ZBW – Leibniz Information Centre for Economics, and RWI – Leibniz Institute for Economic Research, I4R Discussion Papers are among others listed in RePEc (see IDEAS, EconPapers). Complete list of all I4R DPs - downloadable for free at the I4R website.

I4R Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

**Editors**

**Abel Brodeur**
***University of Ottawa***

**Anna Dreber**
***Stockholm School of Economics***

**Jörg Ankel-Peters**
***RWI – Leibniz Institute for Economic Research***

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

# Replicating "Playing Politics with Environmental Protection: The Political Economy of Designating Protected Areas"*

Laura Villalobos Jill Caviglia-Harris Tharaka Jayalath

September 21, 2023

**Abstract**

Mangonnet et al. (2022) examine whether political alignment at the national and sub-national levels explain the spatial designation of Protected Areas (PAs) in Brazil. Their identification relies on spatial discontinuities in political alignment across municipalities. They find that a president-mayor coalition alignment reduces the incidence of PAs by about one percentage point, whereas they find no party alignment effects. We were able to reproduce the paper's findings using the same code and software. Alternative software routines reproduce their results with small and inconsequential numerical differences. Moreover, robustness replications find consistent results for one out the two treatments. Finally, we find no evidence of fabrication of data.

KEYWORDS: replication study, robustness replicability, reproducibility

*Authors: Villalobos (corresponding author): Salisbury University. E-mail: lxvillalobos@salisbury.edu Caviglia-Harris: Salisbury University. E-mail: jlcaviglia-harris@salisbury.edu Tharaka Jayalath: University of Saskatchewan. E-mail: taj771@mail.usask.ca. Authors declare no conflict of interest.

# 1 Introduction

Mangonnet et al. (2022) use a Geographic Regression Discontinuity (GRD) to test whether political alignments impact the amount of land that is set aside as protected areas (PAs). They define two types of alignment. Coalition alignment indicates membership of a mayor's party within the president's coalition. A coalition is defined as any party in the president's cabinet for a given year. The second type of political alignment is party alignment, which indicates direct party alignment with the president.

This RD uses geographic and political boundaries to identify spatial breaks and define treatment and control areas (Keele and Titiunik 2015). The GRD requires a two-dimensional continuity assumption, meaning that the assignment into the treatment includes both political and spatial dimensions. In this paper, the treatment is determined both by the distance from the municipality border and by whether the cell is in a municipality whose mayor is in coalition or party alignment with the president.

Their unit of observation is a grid cell ("hexes"). The sample includes cells within 25 km of a municipality border. In their baseline specifications, the authors regress the proportion of grid cell covered by a federal protected area on a binary variable indicating president-mayor political alignment, controlling for baseline federal protected area (observed in 1997) and municipality-pair fixed effects. A municipality-pair is formed when, for a given year, one side is governed by an aligned mayor and the other side by an opposition mayor. The original analysis was conducted in R.

This replication reviews the data, code, and results reported in Mangonnet et al. (2022). We begin by visualizing the dependent variable to see if any anomalies can be detected from the data. We then test for computational reproducibility, and replicate the paper's main results (Table 1, Columns 1-6 in Mangonnet et al. (2022)) in Stata and with an alternative R package. In addition, we perform two robustness

replicability tests.

Our first conclusion is that we find no evidence of data falsification since we fail to detect systematic anomalies in the paper's dependent variable. Also, are able to reproduce their code using R and Stata, and find the paper to pass our robustness replicability tests. While we are able to reproduce the paper results, we did find some small numerical differences. These differences are consistent across the tests run both in R and Stata, but do not contradict the paper's main results. Finally, the paper's main results pass our robustness replicability tests, but we do find that the results for the party alignment treatment are sensitive to the model specification and the definition of the unit of analysis.

## 2 Visual inspection of the dependent variable

The first step in reproducibility and replicability studies should be to ascertain data validity. Academic misconduct is rare; however, the fabrication of data is common among retracted papers (Brainard and You 2021, Fang et al. 2012). Simple statistical tests and data visualizations can be used to detect fabricated data, especially when there is a good understanding of the phenomena being studied (Simonsohn 2013). In our case, we are interested in testing if the dependent variable looks like we expect based on our knowledge of protected areas in Brazil (West et al. 2022).

Our data visualizations include histograms to visualize the distribution and jittered strip plots to "see" the full data set. We begin with histograms of the dependent variable (proportion of the grid cell covered by a federal protected area) and the change in these values over time for the subsample in Mangonnet et al. (2022)'s Table 1, Columns 1 to 3 (Figure 1).

These figures suggest the data is close to discrete: most of the values are zeros, but once the zeros are omitted, a large portion of the data takes on a value of one. We then created jittered strip plots of the annual change in the percentage of PAs in a given cell (Figure 2).

What we expected to see is gaps in 2003, 2007, 2009, and 2010, years in which there were no new federal PAs established (West et al. 2022). We do not see this with the full sample, but begin to see this pattern when the 0 values are removed. There are a few values in the later years, which we assume are small GIS errors in the data since they are small values and are small in number. We also perform the same visual inspection of the treatment variables and do not find any oddities.

# 3 Reproduction

## 3.1 Computational reproducibility

We were able to locate and download the replication materials as available at Mangonnet et al. (2021), and with those materials execute the authors' R code. We obtain the same results as reported in Mangonnet et al. (2022) without any modifications to the code.

## 3.2 Table 1 with R's newer command *fixest*

Mangonnet et al. (2022) uses the *lfe* package (Gaure 2013) to generate fixed-effect estimations. However, *fixest* is a newer package that is suited for high dimensional data. This package tends to be significantly faster and allows for more functionality (Bergé 2018). We compare the performance of both packages by estimating the same model specifications as in Mangonnet et al. (2022)'s Table 1 using *fixest*. We fail to obtain the same exact results as reported in the paper's Table 1. However, the differences are minor (Table 1). The standard errors in Columns 5 and 6 are slightly higher, and the Adjusted $R^2$ in Columns 2 and 5 are slightly lower with *fixest*. Interestingly, these are the exact same results we obtain with Stata's *reghfe* command with the *"keepsingletons"* option (see Section 3.3). Notably, *fixest* does prove to be significantly faster. It took us about 12 minutes to replicate Table 1 with *lfe*, but only 12 seconds with *fixest* using R version 4.2.2. The comparison was conducted on a computer with a processor of Intel(R) Xeon(R) E-2124G CPU @

3.40GHz and 16GB RAM.

### 3.3 Table 1 with Stata

We also replicate Table 1 in Mangonnet et al. (2022) using Stata/SE 16.1 for Windows (64-bit x86-64) and Stata's command *reghfe*, which includes a novel and robust algorithm to efficiently absorb the fixed effects and allows for multiple levels of fixed effects (Correia 2014). Our specifications include the same sample and same dependent and independent variables. We cluster the standard errors at the same level and absorb the same fixed effects.

We find differences in the standard errors, number of observations included in the regressions, and adjusted $R^2$ (Table 2). Specifically, the number of observations reported by the regression output is different in all columns except in Column 3. Then, Columns 2 and 5 have different Adjusted $R^2$ values. Finally, Columns 5 and 6 have different values for the standard errors of the variable *"Party Alignment."* Again, these differences are small and do not affect the main results or the conclusions of the paper.

The difference in the number of observations included in the regressions in Table 2 can be attributed to the fact that *reghfe* by default drops singletons, as it is considered best practice (Correia 2015). Hence, we replicate the results with *reghfe*'s option *"keepsingletons"* and report these results in Table 3. We find that the number of observations included in the regression is now the same as in Mangonnet et al. (2022), yet all other differences reported in Table 2 remain.

## 4 Robustness Replicability

We believe that non-linear models are better suited to model the dependent variable in this application (see discussion and figures in Section 2). As noted, the dependent variable is highly skewed with most observations taking the value zero (no federal PAs). Mixed discrete-continuous random variables like this one typically require

special treatment (Belotti et al. 2015). We estimate a two-part model, where a binary choice model is fit for the probability of observing PAs vs no PAs. Then, a linear model is fit for the observations with some PAs.

As a second robustness test, we test whether Mangonnet et al. (2022)'s Table 1 holds when we change the unit of observation from the cell to the segment-border level. This test will help the reader bridge the interpretation of the results between Mangonnet et al. (2022)'s Tables 1 and A5, and our two-part model. Moreover, this test will reassure a reader concerned about the choice of the unit of observation.

## 4.1 Two-part model

The two-part model we estimate is similar to the analysis offered by the authors on the intensive *vs.* extensive margins (Table A5 in Mangonnet et al. (2022)). In these estimations, the authors change the definition of the unit of analysis from cells ("hexes') to the municipality-border segment by aggregating the area under PA for all cells on each side of the border (see our robustness test in Section 4.2).

Then, the authors define a new dependent variable, which takes the value one if there is presence of protected areas and zero otherwise (binary variable) to test for effects along the extensive margin. For the intensive margin, the dependent variable is the same as for the main results (the proportion of area in protected areas).

The authors do not find an effect for the extensive margin, but do find an effect for the intensive margin. The impact is negative, significant, and around three percentage points (Table A5 in Mangonnet et al. (2022)). Their interpretation is that "the president likely limits exposure to new protected areas for allies but cannot avoid it completely" (page 1461).

There are a few differences between their intensive/extensive margin analysis and our two-part model. First, in the two-part model the discrete choice is estimated with a probit regression and we drop all municipality-border pairs for which there is no variation in the outcome. Also, for the second step we condition the sample to observations with positive values of PAs. Hence, the coefficient for the probit

model can be interpreted as the effect of political alignment on the probability of designating protected areas, whereas the coefficient of the continuous part captures the effect of adding PAs to already treated units. We also estimate the marginal effects, which are interpreted as the average effect of political alignment, and can be compared with Mangonnet et al. (2022)'s Table 1 (Columns 1 and 4).

We begin by replicating Mangonnet et al. (2022)'s Table A5 (Table 4). Except for the significance level in Column 3, we are able to exactly replicate their results. Then, we estimate the two-part model at the segment-border level, controlling for Federal Protected Areas in 1997, and including municipality-pair fixed effects (Table 5). We present the results for both treatments coalition and party alignment although the authors only report the intensive/extensive margins results for the coalition alignment treatment. The two-part model for the party alignment treatment will allow us contrast these results with Mangonnet et al. (2022)'s Table 1.

We use Stata's command *twopm* (Belotti et al. 2015). Although a two-part model could be estimated using two separate commands such as *probit* and *reghfe*, *twopm* allows for *(i)* the estimation of joint statistical tests for parameters from both parts of the two-part model, *(ii)* the estimation of the marginal effects, and *(iii)* the computation of robust standard errors (Belotti et al. 2015). On the downside, it takes about 30 minutes to run *twopm* for the coalition treatment specification.

We find no effect of political alignment on the probability of having PAs enacted for either treatment (Table 5). For the coalition alignment treatment, this is aligned with the authors' results on the extensive margin. We also find a negative effect both of coalition and party alignment on the amount of PAs. This is also consistent with the authors' findings on the intensive margin for the coalition alignment treatment.

The average marginal effect for both treatments is negative, but it is statistically significant only for the coalition alignment treatment. This is aligned with the paper's main results (Table 1 in Mangonnet et al. (2022)). However, the magnitude of the effects is notably larger in the two-part model. The joint statistical test for

the coalition alignment treatment is significant at the 5% level (*P-value*=0.044), whereas for the party alignment treatment it is not significant (*P-value*=0.170).

In sum, the coefficients estimated by our two-part model are larger than Mangonnet et al. (2022)'s main results, but the conclusions hold in terms of sign and statistical significance.

## 4.2 Unit of observation

The authors estimate the main results at the cell level, but their analysis of the intensive/extensive margin is conducted at the municipality-border level. The reason for this choice is not made clear in the paper, leaving the reader wondering whether the main results hold with the alternative definition for the unit of observation.

We estimate Mangonnet et al. (2022)'s Table 1 at the segment-border level and find that their main results hold for the coalition alignment treatment. Instead, for the party alignment treatment we find consistent results only for the specification that controls for pre-treatment PAs, but not for the specifications that include municipality fixed-effects (Table 6).

Columns 5 and 6 in Table 6 would lead to different conclusions compared to Mangonnet et al. (2022)'s main results and to our own two-part model's average marginal effects. In those two cases, party alignment does not have an effect on the designation of federal protected areas. However, the negative and statistically significant effect is consistent with the second step of the two-part model, although the magnitudes differ considerably.

The discrepancy between the results at the cell and segment-border level for the party alignment treatment could be explained by the well-known "ecological fallacy" concept: results may differ depending on the scale at which the variables are measured. This is also known in the literature as the "aggregation bias" or a "modifiable area unit problem" (Wong 2009, Idrovo 2011, Avelino et al. 2016). We conclude that the effects of the party alignment treatment are not robust to changes in the unit of analysis or to the specification of the model.

# 5 Conclusions

Mangonnet et al. (2022) use Geographic Regression Discontinuity (GRD) in a creative way to test for the effect of political alignment on the amount of land that is set aside as protected areas (PAs). We are impressed by how the authors created the data set, drawing on political borders to test whether it pays to be in the same coalition/party as the president. We test whether their results are reproducible and replicable and find that their main results for the coalition alignment treatment hold up to a series of robustness checks, but the party-alignment effects are sensitive to the definition of the unit of analysis and the specification of the model.

# References

Avelino, A. F. T., Baylis, K. and Honey-Rosés, J.: 2016, Goldilocks and the raster grid: selecting scale when evaluating conservation programs, *PLoS One* **11**(12), e0167945.

Belotti, F., Deb, P., Manning, W. G. and Norton, E. C.: 2015, twopm: Two-part models, *The Stata Journal* **15**(1), 3–20.

Bergé, L.: 2018, Efficient estimation of maximum likelihood models with multiple fixed-effects: the R package FENmlm, *CREA Discussion Papers* (13).

Brainard, J. and You, J.: 2021, What a massive database of retracted papers reveals about science publishing's 'death penalty'. Type: dataset.
**URL:** *https://www.science.org/content/article/what-massive-database-retracted-papers-reveals-about-science-publishing-s-death-penalty*

Correia, S.: 2014, REGHDFE: Stata module to perform linear or instrumental-variable regression absorbing any number of high-dimensional fixed effects, Statistical Software Components, Boston College Department of Economics.
**URL:** *https://ideas.repec.org/c/boc/bocode/s457874.html*

Correia, S.: 2015, Singletons, cluster-robust standard errors and fixed effects: A bad mix, *Technical Note, Duke University* **7**.

Fang, F. C., Steen, R. G. and Casadevall, A.: 2012, Misconduct accounts for the majority of retracted scientific publications, *Proceedings of the National Academy of Sciences* **109**(42), 17028–17033. Publisher: Proceedings of the National Academy of Sciences.
**URL:** *https://www.pnas.org/doi/10.1073/pnas.1212247109*

Gaure, S.: 2013, lfe: Linear group fixed effects, *The R Journal* **5**(2), 104–117. User documentation of the 'lfe' package.

**URL:** *https://journal.r-project.org/archive/2013/RJ-2013-031/RJ-2013-031.pdf*

Idrovo, A. J.: 2011, Three Criteria for Ecological Fallacy, *Environmental Health Perspectives* **119**(8), a332–a332. Publisher: Environmental Health Perspectives.
**URL:** *https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.1103768*

Keele, L. J. and Titiunik, R.: 2015, Geographic boundaries as regression discontinuities, *Political Analysis* **23**(1), 127–155.

Mangonnet, J., Kopas, J. and Urpelainen, J.: 2021, Replication Data for: Playing Politics with Environmental Protection: The Political Economy of Designating Protected Areas.
**URL:** *https://doi.org/10.7910/DVN/N6LIMH*

Mangonnet, J., Kopas, J. and Urpelainen, J.: 2022, Playing politics with environmental protection: The political economy of designating protected areas, *The Journal of Politics* **84**(3), 1453–1468.

Simonsohn, U.: 2013, Just Post It: The Lesson From Two Cases of Fabricated Data Detected by Statistics Alone, *Psychological Science* **24**(10), 1875–1888. Publisher: SAGE Publications Inc.
**URL:** *https://doi.org/10.1177/0956797613480366*

West, T. A. P., Caviglia-Harris, J. L., Martins, F. S. R. V., Silva, D. E. and Börner, J.: 2022, Potential conservation gains from improved protected area management in the Brazilian Amazon, *Biological Conservation* **269**, 109526.
**URL:** *https://www.sciencedirect.com/science/article/pii/S0006320722000799*

Wong, D.: 2009, Modifiable Areal Unit Problem, *in* R. Kitchin and N. Thrift (eds), *International Encyclopedia of Human Geography*, Elsevier Science. ISBN: 9780080449104.
**URL:** *http://www.sciencedirect.com:5070/referencework/9780080449104/international-encyclopedia-of-human-geography*

# Tables

Table 1: Reproducing Table 1 in Mangonnet et al. (2022) using the *fixest* package (Bergé 2018) in R

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Coalition Alignment | -0.010* | -0.011* | -0.012* | | | |
| | (0.005) | (0.005) | (0.005) | | | |
| Federal Protected Area ('97) | -0.027** | | | -0.027** | | |
| | (0.010) | | | (0.009) | | |
| Party Alignment | | | | -0.011 | -0.007 | -0.011 |
| | | | | (0.009) | (0.011) | (0.009) |
| Municipility Pair FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Grid FE | No | Yes | Yes | No | Yes | Yes |
| State-Year FE | No | No | Yes | No | No | Yes |
| Num.Obs. | 870,719 | 870,719 | 870,719 | 364,213 | 364213 | 364213 |
| Municipality Pairs | 2,075 | 2,075 | 2,075 | 1,245 | 1,245 | 1,245 |
| Unique Grids | 121,141 | 121,141 | 121,141 | 78,265 | 78,265 | 78,265 |
| Adjusted R2. | 0.310 | 0.643 | 0.683 | 0.440 | 0.811 | 0.850 |

Notes : + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 2: Reproducing Table 1 in Mangonnet et al. (2022) using Stata. All models drop singletons

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Coalition Alignment | -0.010* | -0.011* | -0.012* | | | |
| | (0.005) | (0.005) | (0.005) | | | |
| Federal Protected Area ('97) | -0.027** | | | -0.027** | | |
| | (0.010) | | | (0.009) | | |
| Party Alignment | | | | -0.011 | -0.007 | -0.011 |
| | | | | (0.009) | (0.011) | (0.009) |
| Municipality Pair FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Grid FE | No | Yes | Yes | No | Yes | Yes |
| State-Year FE | No | No | Yes | No | No | Yes |
| Municipality Pairs | 2,072 | 2,070 | 2,070 | 1,245 | 1,245 | 1,245 |
| Obs in reg | 870,716 | 870,376 | 870,376 | 364,213 | 363,680 | 363,680 |
| Singleton obs | 3 | 343 | 343 | 0 | 533 | 533 |
| Obs (including singletons) | 870,719 | 870,719 | 870,719 | 364,213 | 364,213 | 364,213 |
| Adjusted $R^2$ | 0.310 | 0.643 | 0.683 | 0.440 | 0.811 | 0.850 |

Notes: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001.

Table 3: Reproducing Table 1 in Mangonnet et al. (2022) using Stata. All models keep singletons

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Coalition Alignment | -0.010* | -0.011* | -0.012* | | | |
| | (0.005) | (0.005) | (0.005) | | | |
| Federal Protected Area ('97) | -0.027** | | | -0.027** | | |
| | (0.010) | | | (0.009) | | |
| Party Alignment | | | | -0.011 | -0.007 | -0.011 |
| | | | | (0.009) | (0.011) | (0.009) |
| Municipality Pair FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Grid FE | No | Yes | Yes | No | Yes | Yes |
| State-Year FE | No | No | Yes | No | No | Yes |
| Municipality Pairs | 2,075 | 2,075 | 2,075 | 1,245 | 1,245 | 1,245 |
| Obs in reg | 870,719 | 870,719 | 870,719 | 364,213 | 364,213 | 364,213 |
| Singleton obs | 0 | 0 | 0 | 0 | 0 | 0 |
| Obs (including singletons) | 870,719 | 870,719 | 870,719 | 364,213 | 364,213 | 364,213 |
| Adjusted $R^2$ | 0.310 | 0.643 | 0.683 | 0.440 | 0.811 | 0.850 |

Notes: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001.

Table 4: Reproducing Table A5 in Mangonnet et al. (2022) using Stata

| | Federal Protected Area (Dummy) | | | Federal Protected Area (Proportion) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Coalition Alignment | 0.000 | -0.004+ | -0.004 | -0.003* | -0.004** | -0.004** |
| | (0.003) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) |
| Dummy Fed. Prot. Area ('97) | -0.029 | | | | | |
| | (0.021) | | | | | |
| Federal Protected Area ('97) | | | | -0.082+ | | |
| | | | | (0.046) | | |
| Municipality Pair FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Muni. FE | No | Yes | Yes | No | Yes | Yes |
| State-Year FE | No | No | Yes | No | No | Yes |
| Municipality Pairs | 2,061 | 2,061 | 2,061 | 2,061 | 2,061 | 2,061 |
| Obs in reg | 25,779 | 25,779 | 25,779 | 25,779 | 25,779 | 25,779 |
| Singleton obs | 14 | 14 | 14 | 14 | 14 | 14 |
| Obs (including singletons) | 25,793 | 25,793 | 25,793 | 25,793 | 25,793 | 25,793 |
| Adjusted $R^2$ | 0.585 | 0.649 | 0.681 | 0.538 | 0.619 | 0.646 |

Notes: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001. Singletons are dropped. FE = fixed effects.

Table 5: Two-part model. The unit of observation is the municipality-border

| | Coalition alignment (1) | Party alignment (2) |
|---|---|---|
| probit | | |
| Coalition Alignment | 0.008 | |
| | (0.099) | |
| Federal Protected Area ('97) | -0.459 | -4.742** |
| | (0.612) | (1.835) |
| Party Alignment | | 0.071 |
| | | (0.204) |
| regress | | |
| Coalition Alignment | -0.078* | |
| | (0.034) | |
| Federal Protected Area ('97) | -0.773*** | -0.706*** |
| | (0.171) | (0.107) |
| Party Alignment | | -0.097+ |
| | | (0.053) |
| marginal effects | | |
| Coalition Alignment | -0.036* | |
| | (0.018) | |
| Federal Protected Area ('97) | -0.401*** | -0.741*** |
| | (0.095) | (0.156) |
| Party Alignment | | -0.043 |
| | | (0.032) |
| Municipality Pair FE | Yes | Yes |
| Muni. FE | No | No |
| State-Year FE | No | No |
| Obs in reg | 1,220 | 652 |
| Obs in probit | 2,157 | 947 |
| Clusters in reg | 158 | 87 |
| Clusters in probit | 135 | 73 |

Notes: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001. FE = fixed effects.

Table 6: Reproducing Table 1 in Mangonnet et al. (2022) using Stata at the municipality-border level

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Coalition Alignment | -0.003* | -0.004** | -0.004** | | | |
| | (0.002) | (0.001) | (0.001) | | | |
| Federal Protected Area ('97) | -0.082+ | | | -0.077+ | | |
| | (0.046) | | | (0.039) | | |
| Party Alignment | | | | -0.003 | -0.011* | -0.010* |
| | | | | (0.003) | (0.005) | (0.005) |
| Municipality Pair FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Muni. FE | No | Yes | Yes | No | Yes | Yes |
| State-Year FE | No | No | Yes | No | No | Yes |
| Municipality Pairs | 2,061 | 2,061 | 2,061 | 1,245 | 1,245 | 1,245 |
| Obs in reg | 25,779 | 25,779 | 25,779 | 10,734 | 10,734 | 10,734 |
| Singleton obs | 14 | 14 | 14 | 0 | 0 | 0 |
| Obs (including singletons) | 25,793 | 25,793 | 25,793 | 10,734 | 10,734 | 10,734 |
| Adjusted $R^2$ | 0.538 | 0.619 | 0.646 | 0.682 | 0.766 | 0.783 |

Notes: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001. FE = fixed effects.

# Figures

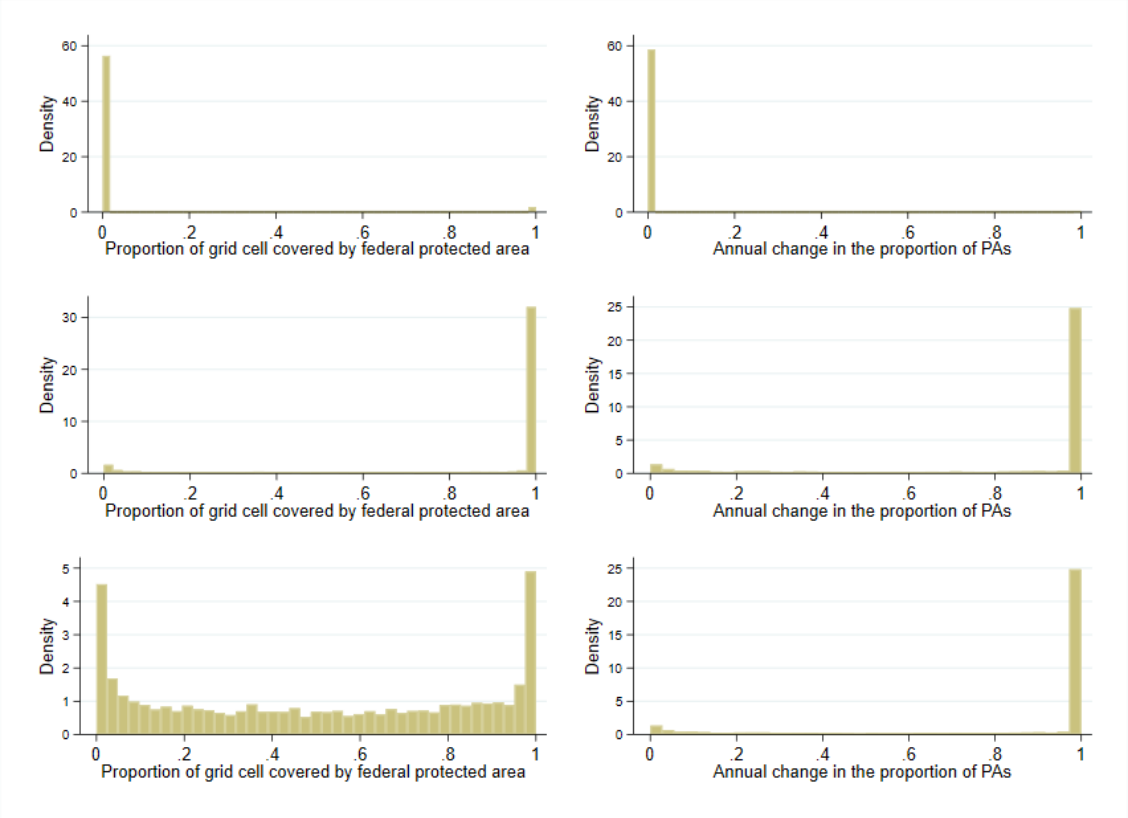


Figure 1: Histograms of the Dependent Variable for the sample in Mangonnet et al. (2022)'s Table 1, Columns 1 to 3. The first row of figures includes the full sample. The second row omits observations with values equal to zero. The third row excludes observations taking value zero or one.

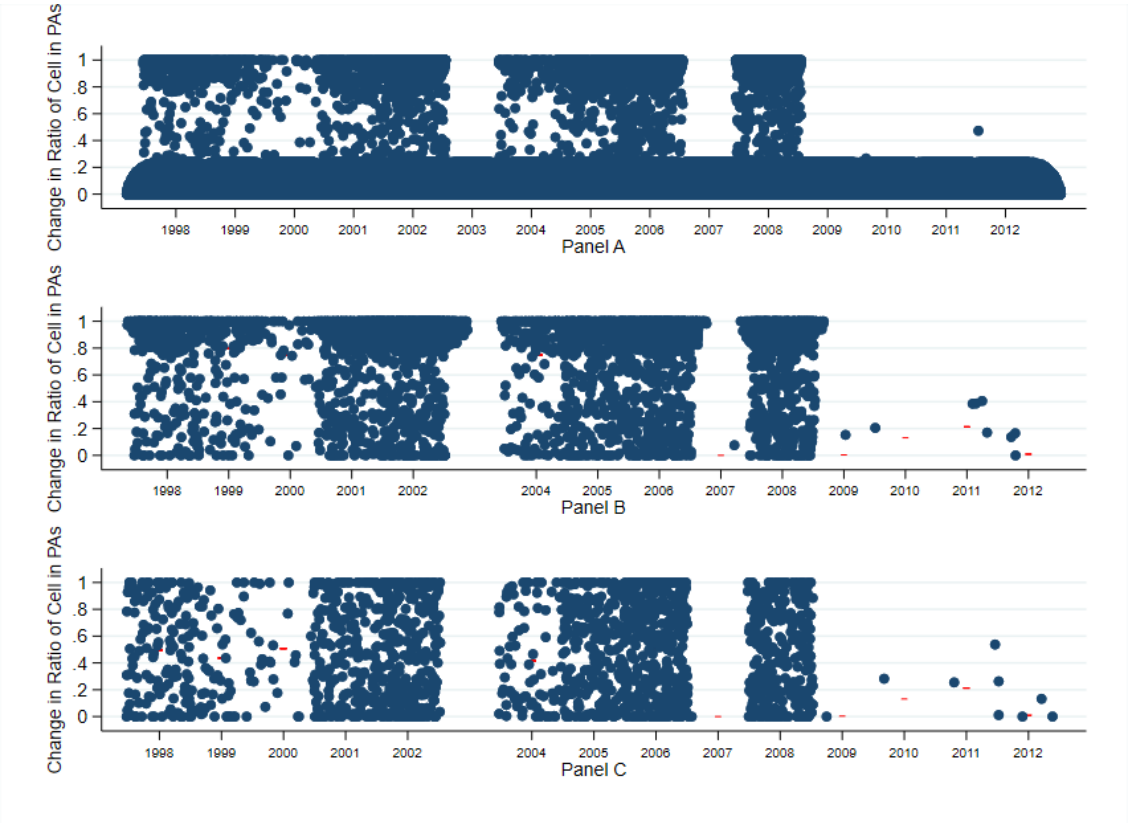


Figure 2: Strip Plot of the Change in PAs for the sample in Mangonnet et al. (2022)'s Table 1, Columns 1 to 3. Each dot represents an observation. The red bars (when visual) show the annual mean values. Panel A includes the full sample. Panel B omits observations taking on values equal to zero. Panel C excludes observations taking on values zero or one.