Power Plays in the Jungle: Political Alignment and Environmental Degradation in Colombia*

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Abstract

We study how the institutional design of environmental authorities influences environmental degradation, focusing on the political alignment between mayors and governors in Colombia. In regions where governors serve as board directors of Regional Environmental Protection Agencies (REPAs), we examine whether partisan alignment between local and regional executives affects deforestation. We compile novel data on REPA board composition and leadership, merging it with municipal-level deforestation outcomes. To identify causal effects, we implement a regression discontinuity design based on close mayoral elections, comparing municipalities where the governor-aligned candidate narrowly won to those where they narrowly lost. We find that political alignment increases deforestation by 60 percent. The effect is concentrated in REPAs with politically dominated boards and during election years. We find no evidence that increased deforestation in aligned municipalities is associated with higher economic growth or public investment. Our results underscore the importance of institutional safeguards in insulating environmental governance from political interference.

Keywords: Deforestation, Political Economy, Colombia

JEL Classification: P48, Q23

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I INTRODUCTION

Deforestation is a significant driver of climate change, accounting for an estimated 6–17 percent of global anthropogenic greenhouse gas emissions (Van der Werf *et al.*, 2009). Notably, approximately two-thirds of these emissions originate from tropical forests (Achard *et al.*, 2014). From 2001 to 2020, tropical regions lost 1.48 million square kilometers of forest—an area larger than the combined territories of France, Germany, and Spain (Balboni *et al.*, 2023). Understanding the drivers of deforestation in these areas is critical. One such driver is weak institutional capacity, which can enable forest loss. This paper examines how political alignment between local and regional officials contributes to deforestation in Colombia.

We provide evidence that partisan alignment between mayors and governors weakens natural resource management by environmental authorities, leading to decisions that undermine environmental governance. This effect is most pronounced in areas where Regional Environmental Protection Agencies (REPAs) are headed by governors, making them more susceptible to political influence and more likely to prioritize short-term economic interests over long-term conservation goals.

Colombia offers a unique institutional setting for this analysis. First, its tropical geography makes it one of the most biodiverse countries globally, with natural forests covering 52% of its land area—the third largest forest area in Latin America. Despite this, environmental degradation has been substantial, with forest loss since 2000 equivalent to four million soccer fields (DNP, 2020b). Second, in contrast to countries such as the United States, where environmental policy is largely centralized, Colombia has legally decentralized key components of its environmental policy. Each region is thus overseen by an autonomous REPA. Third, REPA boards are composed of diverse stakeholders, including governors, mayors, private sector representatives, NGOs, academics, and indigenous groups. Fourth, there is institutional variation in who serves as the REPA board director by law. In some regions, the governor is mandated to serve as director; in others, the role is held by a non-political appointee. This variation provides a quasi-natural experiment that allows us to assess the effect of mayor–governor alignment on deforestation rates, comparing regions where the governor directs the REPA with those where the director is not a political figure.

To investigate this question, we compile data on REPA board composition and leadership, and link it to deforestation outcomes at the municipal level. To identify causal effects, we implement a regression discontinuity design (RDD) based on close mayoral elections. Specifically, we compare municipalities where a candidate aligned with the governor narrowly won to those where the aligned candidate narrowly lost. We define partisan alignment as both the mayor and the governor belonging to the same political party. Our identification strategy assumes that within a sufficiently narrow vote margin, the outcomes in aligned-losing and aligned-winning municipalities are comparable, making the former a valid counterfactual for the latter.

Our results indicate that partisan alignment between mayors and governors increases deforestation by approximately 60%. This corresponds to an annual loss of about 5,300 hectares of primary forest, or 5% of Colombia's total yearly deforestation. The effect is concentrated in municipalities governed by REPAs in which the governor serves as board director.

We identify three mechanisms driving this result. First, in REPAs where boards are dominated by political actors, governors serving as directors are more likely to authorize higher levels of deforestation. Second, greater divergence in environmental preferences between political and non-political board members is associated with increased forest loss. Third, deforestation spikes during election years.

To interpret these findings, we develop a simple theoretical model based on Aghion and Tirole (1997). In the model, the REPA board (the principal) sets environmental policy, while the director (the agent) determines the extent to which she adheres to this policy based on her private incentives. The model yields two predictions consistent with our empirical results. First, the greater the agent's private gains from favoring politically aligned actors in the allocation of deforestation permits, the more likely she is to do so. Second, the more board seats are held by political actors with less environmentally friendly ("browner") preferences, the higher the overall level of deforestation. In our framework, we define "green" preferences as favoring lower deforestation levels, and "brown" preferences as favoring higher levels.

Our findings suggest that increased deforestation results from political capture of environmental institutions, rather than from politicians responding to constituent preferences for economic growth. This interpretation is supported by the absence of significant increases in municipal GDP, public investment, night-time light intensity, or cropland expansion. Instead, we observe land use changes consistent with cattle ranching and grass pasture expansion—activities commonly associated with large landowners in Colombia (IGAC, 2023; DNP, 2020a).

This paper contributes to the growing literature on the political economy of deforestation, particularly on how political incentives distort the implementation of environmental policies. We add to a body of work that distinguishes between the formal (de jure) design of environmental institutions and their practical (de facto) functioning (Balboni *et al.*, 2023).

Prior studies have shown that political dynamics shape forest outcomes in multiple contexts. For instance, (Burgess *et al.*, 2012) show that decentralization in Indonesia incentivized local officials to increase timber extraction. Bragança and Dahis (2022) find that real-time monitoring of illegal deforestation in Brazil reduces deforestation by farmer-politicians. Similarly, Prem *et al.* (2020) document a rise in deforestation in Colombia following a ceasefire with guerrilla groups.

Electoral cycles also influence deforestation. Burgess *et al.* (2012), Balboni *et al.* (2021), and Pailler (2018) find that deforestation and fire activity rise during election periods in countries with weak institutions. Harding *et al.* (2024) provides evidence that Colombian mayors reliant on campaign donations are less likely to penalize illegal deforestation. From a theoretical standpoint, Harstad (2023) shows that shifts in political stability affect the balance of agricultural and environmental lobbying in Brazil.

Partisan alignment has also been examined in the political economy literature, though with greater emphasis on political and economic outcomes. Burgess *et al.* (2015) and Hodler and Raschky (2014) investigate how shared ethnicity and birthplace between governors and citizens influence the allocation of public resources and services, finding evidence of favoritism. More specifically, Brollo *et al.* (2014), Bracco *et al.* (2015), and Carozzi *et al.* (2024) explore the impact of political alignment across different tiers of government on intergovernmental transfers, electoral outcomes, and government stability. These studies employ regression discontinuity designs based on close electoral races in Brazilian, Italian, and Spanish municipalities, respectively, and suggest positive effects.

We contribute to these bodies of literature by emphasizing how local political alignment affects decisions made by regional environmental authorities, and how institutional design can either protect or expose forest governance to political influence. In Colombia, institutional rules determining who serves as REPA board director are critical for limiting political capture and mitigating legal deforestation driven by local political incentives.

II CONTEXT

Colombia is a democratic and decentralized Republic. In the 1980s, the country began its political, administrative, and fiscal decentralization, the former involving the popular election of department(state) governors and the latter distributing functions and resources to territorial governments Maldonado (2001). The first local elections for local governors were held in 1988. Subsequently, the 1991 Constitution further institutionalized the decentralized political framework by formally defining the responsibilities and fiscal capacities of sub-national governments, setting the stage for additional reforms in the years that followed.

Due to the availability of deforestation data, this study focuses on the electoral periods beginning in 2001, 2004, 2008, 2012, and 2016. Until 2003, the term of office for local governors was three years; this was extended to four years through Legislative Act No. 2 of 2002. Colombia is divided into 32 states, each headed by an elected state governor. These states are further subdivided into 1,101 municipalities where the mayors serves as the highest local authority.

Within Colombia's decentralization framework, the Political Constitution grants financial and administrative autonomy to Regional Environmental Protection Authorities (REPAs).[1] The 33 REPAs among the country are one of the key governmental actors in environmental decision-making.[2] Among their responsibilities, REPAs oversee the management [3]and use of natural resources within their jurisdiction, which comprises the group of municipalities that share a common ecological area.[4] The jurisdiction does not always align with state boundaries and, in some cases, it even extend beyond them (Figure A.1).

The main administrative body of each REPAs is the Board of Directors.[5] The Board of Directors is the decision-making body of the REPA and its in charge of setting the environmental policy agenda. Among its functions is to approve the incorporation or subtraction of special protection areas, especially regarding forest areas in their jurisdiction. The Board of Directors size is defined by national laws, stipulating that each board must have between 8 and 19 members. Additionally, its composition is mandated to ensure representation from both governmental and non-governmental sectors.

The national and sub-national executive branches hold seats in the Board of Directors, including representatives from (i) the National President's Office or the Ministry of Environment, (ii) state governments, and (iii) municipal governments. Among subnational representatives, state governors within the REPA's jurisdiction have permanent seats, while up to four municipal representatives, selected from the REPA's municipalities, rotate annually.[6] On the non-governmental side, the private sector, ethnic groups and environmental NGOs are selected by their representative groups every four years.

Following the decentralized structure at the regional level of the REPAs, each Board acts independently and is responsible for defining the internal dependencies and responsibilities among its members to achieve the

[1]Despite their autonomy, they are part of the National Environmental System (SINA, by its Spanish acronym), which also includes the Ministry of Environment, states, and municipalities

[2]Twenty-six of these REPAs were established under Law 99 of 1993. The REPA called Corporación Autonoma Regional del Rio Grande was exempted from this legal framework (Función Publica, n.d). This is the reason why this REPA is not included in the analysis.

[3]Environmental licenses, concessions, and authorizations are permits granted by environmental authorities, subject to compliance with regulations on prevention, mitigation, correction, compensation, and environmental management (Law 99 of 1993, Art. 50). The issuance of these permits is managed by SINA members based on the nature of the license. Resolution 1263 of 2006 assigns the Ministry of Environment the authority to grant environmental licenses, oversee REPAs, set global quotas, and determine resource use regulations for permit issuance. The Ministry primarily handles matters of national importance, such as hydrocarbons, mining, transportation infrastructure, and the National System of Protected Areas (Law 99 of 1993, Art. 50), while REPAs are responsible for granting concessions related to forest and water use (Law 99 of 1993, Art. 31).

[4]Additionally, they assist local governments in drafting, developing, and approving development plans and provide guidance on projects involving specific environmental resources, such as royalties.

[5]Each REPA has three administrative bodies: The Corporate Assembly, The Board of Directors, and The General Director. The Corporate Assembly are made up of the municipalities and department governors that constitute the common ecological REPA's area. It is in charge of electing the Board of Directors.

[6]Law 99 of 1993, Art. 26, stipulates that the selected mayors should be chosen in a way that ensures representation from all states or sub-regions. They are elected through the electoral quotient system based on the votes of assembly members.

REPA's functions.[7] Each Board operates under its own bylaws, which specify the criteria for appointing and defining the functions of its director.[8]

III DATA AND SUMMARY STATISTICS

Our database consists of a balanced panel covering 1,101 Colombian municipalities over the period 2001-2020. The key outcome of interest is the deforestation measurements calculated based on satellite imagery. This analysis uses data from state and municipal elections to identify whether the local political alignment influences environmental outcomes, framed by the REPAs structure. Political alignment is a dummy equal to one if the municipality mayor belongs to the same political party as the state governor. The dataset includes information on the structural and compositional attributes of the REPAs across municipalities and years. In addition, we compiled contextual information on municipal and party characteristics.

- *Remote Sensing.* We measure primary forest cover and change based on the data from the Global Land Analysis and Discovery project (GLAD). We use Hansen (2013) Global Forest Change Imagery to assess tree cover and loss. This dataset has a pixel resolution of 0.00025 degrees (equivalent to approximately 30 square meters at the Equator), making it suitable for calculating forest loss at a higher level of spatial aggregation. Particularly, we are focused on the primary humid tropical forest measurements. Following the methodology proposed by Turubanova *et al.* (2018), we use the 2000–2001 baseline of primary forest cover to track changes between 2001 and 2020. These areas are broadly defined as those that have not been entirely cleared and subsequently regenerated in recent decades.[9]

We calculate various measures of built-up lands, grassland, cropland, using spatial images based on the Dynamic World (2022) land cover database. This imagery has a pixel resolution of 10 square meters, which allows us to observe the change in land use for deforested pixels. However, it is only available from 2015 onwards.

To proxy economic growth, we use night-time light radiance. Given that our analysis spans from 2001 to 2020, we rely on the harmonized VIIRS-DMSP time series developed by Li *et al.* (2020). Additionally, we rely on the GAEZ v4 dataset to obtain information on agro-ecological zones, which includes data on specific crop suitability.

Finally, we use the Biodiversity Intactness Index (BII) to measure the impact of deforestation on biodiver-

[7] The Constitutional Court in its ruling 462 of 2008, highlights that one of the features of the autonomy of the CARs is to give them their own statutes, so the Ministry of Environment at the national level does not have the power to approve their statutes, nor the reforms that modify them.

[8] The governor or their delegate shall preside over the Board of Directors when the REPAs jurisdiction covers only one department. If there are several governors, the statutes shall define the director of the Board of Directors

[9] To avoid bias due to measurement outliers, we discarded the highest 1 per cent of the calculated values of forest loss at the year-municipality level.

sity loss. The BII is a metric that quantifies the degree to which ecosystems retain their original species composition and functional diversity, providing insights into the ecological health of an area (De Palma *et al.*, 2021). The BII data is available at a 1 km resolution and is provided in five-year intervals since 2000.

- *Political Elections.* Data on elections for governors and mayors from 2001 to 2019 were shared by the CEDE data repository of the University of Los Andes. The data provided contains relevant information, including the names of the candidates, election turnout, the number of votes for each candidate, registered voters, and the respective parties of each candidate.

- *REPAs' committees.* Data on the formal composition and structure of each REPA's committees according to the law was obtained from the related laws. Particularly, Law 99 of 1993, Decree 1076 of 2015 and Manual of the structure of the Colombian State by the Colombian Civil Service Department. We get information about the number and profile of Board members, as well as well as on the appointment or non-appointment of state governors as its directors.

-*Green and no-green political parties' classification.* We derived the classification from congressional voting records on legislation pertaining to international environmental commitments [10] and domestic logging regulations (2008) [11]. Congreso Visible at Universidad de los Andes provided a database with the voting record of projects related to the environment from July 2010 to August 2016.[12] We selected the projects where the approval rate was between 45% and 55% and then those related to international or national environmental direct regulations. Finally, we constructed the green and non-green vocations of the political parties based on statistical measurements of their votes in favour. In particular, the average of the percentage of party members voting in favour of "environmental projects".[13]

- *Municipal characteristics.* Data was provided by CEDE at Universidad de los Andes, and it is based on official records about general features, agricultural production, conflict and government in a time window from 1993 to 2021.[14] For example, the base includes municipality area, altitude, population, poverty and inequality measurements, and coca area. In addition, administrative data on municipal public finance.

Additionally, data on gross municipal production for the period 2011–2020 were obtained from the National Statistics Department (DANE, 2025). Municipal-level crop production data for 2007–2018 were pro-

[10](i. Environmental Agreement between Canada and Colombia (2009). ii. Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (2013). iii.International Tropical Timber Agreement

[11]iv. Whereby the Forestry Law is enacted (2006)

[12]The data was complemented by the authors with the support of Juan Vargas and Leopoldo Fergusson.

[13]We only took the voting for the whole law proposal, not objections or partial proposals. However, these could be more than one, depending on the chambers involved. Therefore, we calculate the mean among votes within a project and then among the projects. The total of votes includes all the members registered to vote, including cases such as non-attendance and absenteeism

[14]The time availability change among the variables

vided by the Ministry of Agriculture. Cattle stock data were sourced from the Colombian Institute of Livestock (ICA, 2020), covering the period 2008–2020 at the municipality level.

- *Environmental crimes.* Data was sourced from the Registry of Sanctions of the Attorney General's Office (Fiscalía General de la Nación, 2025). Crimes have been registered in the Oral Accusatory Criminal System since events that occurred in 2010. These are categorised by crime group, such as environment.

III.A SUMMARY STATISTICS

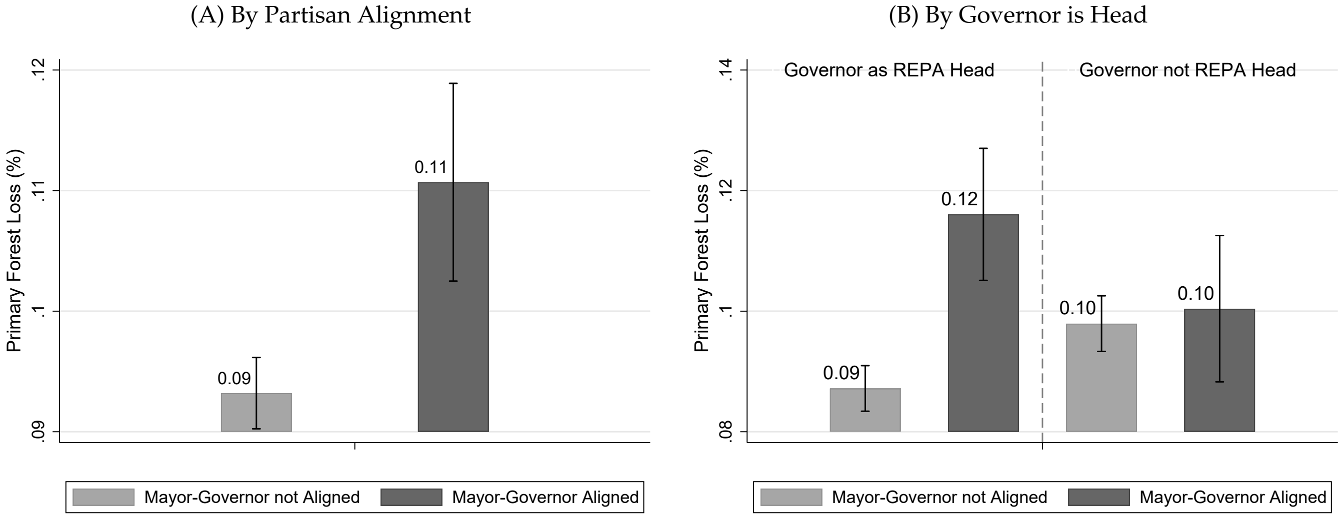
As of 2005, approximately 58% of Colombia's territory was covered by forests. Of this area, 87% was classified as primary forest (Butler, 2005), mainly located in the Amazon region (southern part of the country in Panel A of Figure B.1). However, Colombia has experienced significant increases in primary forest loss, with the annual mean of municipal deforestation rate rising from 0.05% in 2001 to nearly 0.1% by 2020 at the national level. Furthermore, Panel (A) of Figure A.2 and Panel (B) of Figure B.1 show that municipalities in the Amazon have been the most affected, experiencing an average annual loss of 0.16% during the same period—approaching rates seen in other parts of the Amazon region, such as Brazil, where the rate reached 0.21% and where most of the global deforestation is concentrated (Burgess *et al.*, 2023). Notably, the lowest deforestation rates occurred during the negotiation of the peace agreements between the Colombian government and the FARC guerrilla group, which lasted from 2012 to 2016, as indicated by the shaded area in Figure A.2.

As explained in Section II, the Colombian REPAs are responsible for implementing environmental policies at the regional level and are therefore in charge of issuing deforestation permits to individuals seeking to clear land for productive activities. In the Amazon region, the median area authorized for clearing per permit is approximately 60 hectares. Moreover, annual authorized deforestation appears to be positively correlated with the overall deforestation trend in the region, as shown in Panel (A) of Figure A.2. This suggests that REPAs may play an important role in explaining legal deforestation in Colombia.

Exploring the heterogeneity in deforestation, Panel (A) of Figure 1 shows that average primary forest loss during the study period is concentrated in municipalities where the mayor and the governor are aligned through the same political party. The difference in forest loss between aligned and non-aligned municipalities is approximately 0.02 percentage points and appears to be highly significant. Moreover, when examining annual trends, aligned municipalities consistently exhibit higher average primary forest loss compared to non-aligned ones (Panel B of Figure A.2).

To understand the sources of heterogeneity in deforestation, we examine the composition of REPA boards and the profiles of their directors. On average, politicians make up 43% of board members, with this share ranging from 21% to 64%, as shown in Figure B.2. A greater presence of politicians is typically accompanied by a lower share of non-political members, and in 55% of cases, the state governor serves as the REPA board's director. This variation in REPA structures raises the question of whether such differences contribute to deforestation outcomes—particularly when the governor serves as director. This is especially relevant given that mayors lack direct control over environmental policy without the governor's support, as these policies are defined at a higher administrative level than the municipality.

Figure 1. Primary Forest Loss by Partisan Alignment and whether the Governor is REPA's Board Head



Notes: Panel (A) shows the average primary forest loss in municipalities where the mayor and the governor are aligned through the same political party (aligned) and where they are not (non-aligned). Panel (B) presents the same, but distinguishing between municipalities where the governor serves as the REPA board's director (head) and where they do not (not head). The figure includes 95% confidence intervals clustered at the municipality level.

To assess whether the heterogeneity in deforestation between aligned and non-aligned municipalities is driven by REPA structure, we test for significant differences in mean deforestation rates based on political alignment under different REPA configurations. Panel (B) of Figure 1 shows that the difference in average primary forest loss between aligned and non-aligned municipalities is concentrated in municipalities whose governor also serves as the REPA director by law. Notably, this difference is statistically significant and comparable in magnitude to the overall difference in forest loss between aligned and non-aligned municipalities. These findings suggest that partisan alignment between the mayor and the governor may play a critical role in explaining deforestation, particularly when the governor holds direct authority over environmental policy through the REPA.

In fact, the loss of primary forest cover appears to be correlated with a decline in biodiversity in municipalities where the governor serves as the REPA board's director, as shown in Figure A.3. This finding is particularly significant given that Colombia is recognized as a megadiverse country, home to approximately 10% of the world's species (WWF-Colombia, 2017).

Finally, to analyze the dynamics of deforestation over time relative to when a municipality's mayor became politically aligned with the governor, we examine average annual deforestation rates in the years before and after the onset of alignment. For municipalities in ecological zones where the governor serves as the REPA director, we find that the average annual deforestation rate increases by approximately 0.025 percentage points following alignment and remains elevated in subsequent years of the electoral term (Panel A of Figure B.3). In contrast, this pattern is not observed in municipalities where the governor does not serve as REPA director (Panel B of Figure B.3). These results suggest that the rise in deforestation is driven by the governor's direct influence over environmental policy through the REPA, consistent with the patterns identified in the previous stylized facts.

IV EMPIRICAL STRATEGY

IV.A Regression Discontinuity Design

We focus on close mayoral elections in which a candidate aligned with the state governor either won or finished in second place. To estimate the effect of political alignment between the mayor and the governor on deforestation, we rely on the identifying assumption that, within a sufficiently narrow margin of victory, municipalities where the aligned candidate lost serve as a proper counterfactual for those where the aligned candidate won. Our preferred specification is as follows:

$$y_{mt} = \beta \text{AlignedWon}_{mt_e} + f^{+}(\text{Margin}^{+}_{mt_e}) + f^{-}(\text{Margin}^{-}_{mt_e}) + \lambda_t + \varepsilon_{mt} \tag{1}$$

where y_{mt} is the percentage of forest area lost in municipality m on year t of the baseline primary forest cover in 2000. AlignedWon_{mt_e} is a dummy equal to one if the aligned candidate won the election (t_e), and consequently is in office at time t. $f^{+}(\text{Margin}^{+}_{mt_e})$ and $f^{-}(\text{Margin}^{-}_{mt_e})$ are local polynomials of the margin of victory ($+$) or defeat ($-$) of the aligned candidate in the past election. λ_t are time-fixed effects to control for different yearly shocks, such as national policies and dry periods. We use clustered standard errors at the municipality level (ε_{mt}) in the main specification but present robustness to other error types. Lastly, we apply the optimal bandwidth selection algorithm proposed by Calonico *et al.* (2014) to determine the sample. Our dataset includes 2,487 municipality-year observations where either the election winner or runner-up was politically aligned with the state governor and where primary forest cover existed in 2000. Of these, 1,236 observations fall within the optimal bandwidth of a 6.5 percentage points of winning/losing margin.

IV.B No Manipulation of Assignment

A key concern in our identification strategy is the possibility that the state governor is able to manipulate municipal elections, increasing the likelihood of their allies winning. In Figure B.4, we examine the smoothness of the margin of victory/defeat at the threshold. Additionally, we conduct a McCrary test to detect potential manipulation in the assignment. The test results show no significant evidence of it, with a p-value of 0.75, supporting the argument that the density of the margin of victory is continuous around the cutoff. Additionally, we restrict the analysis to municipalities where the mayor was not aligned with the governor in that previous election.

IV.C Local Continuity Assumption

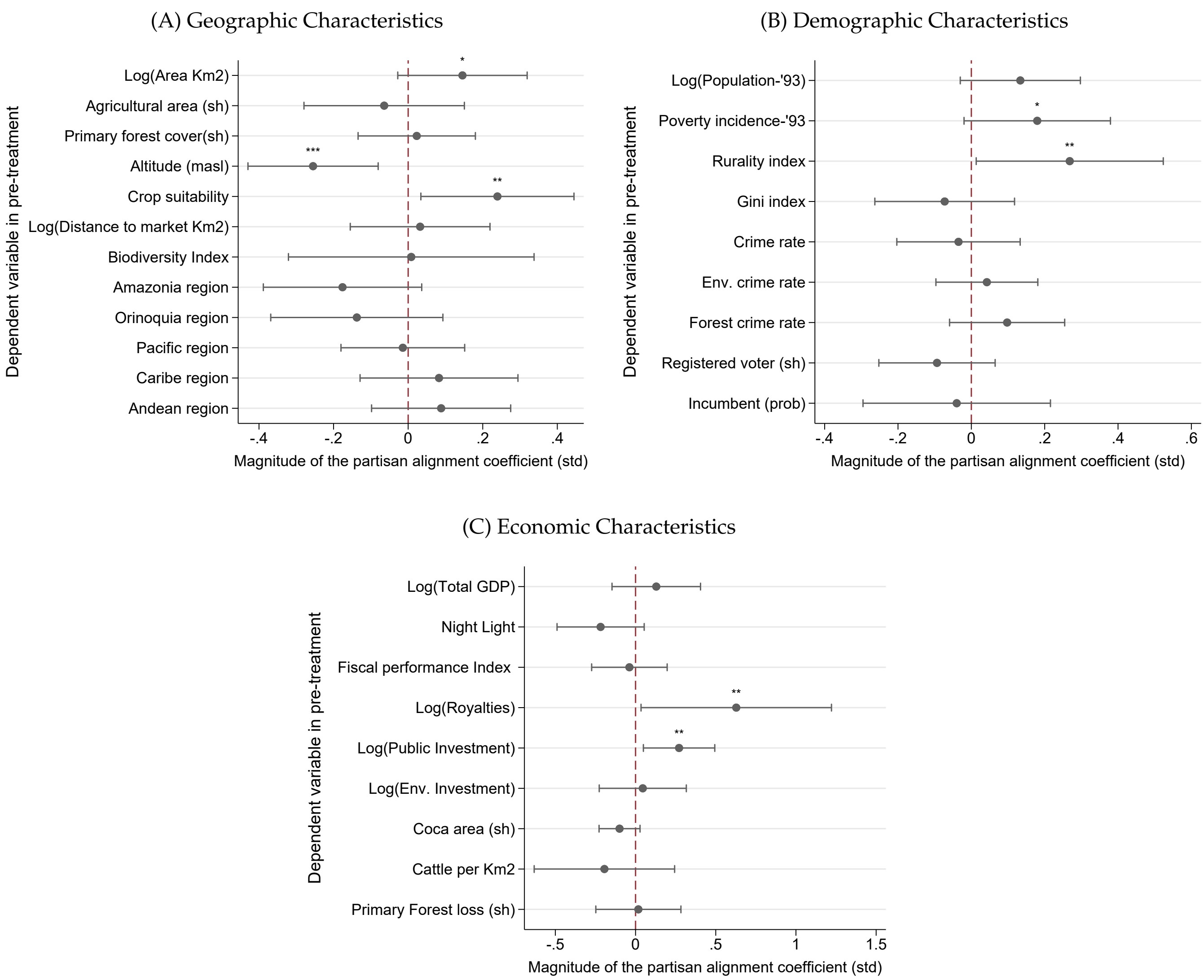
To ensure that municipalities near the threshold are comparable, we test the balance of geographic, demographic, and economic characteristics before the election using the specification in equation (1). To account for the potential influence of baseline differences, we include the variables that are significantly different between aligned and non-aligned municipalities as controls in a robustness specification. As shown in the next section, the main results remain unchanged.

Figure 2 shows that 23 out of 30 baseline characteristics are statistically similar across the cutoff. Point estimates for each of the variables and further details are reported in Tables B.1, B.2, and B.3.

Geographic Characteristics— Panel A of Figure 2 shows no significant differences in the share of municipal land allocated to agriculture, the share of forest area, distance to the nearest market, or the likelihood of one region being overrepresented in the sample. However, we find significant differences in total municipal area, elevation, and in the crop suitability index based on the six main export crops grown in rural Colombia. However, since the share of primary forest cover in 2000 and land allocated to agriculture are similar, we do not consider these differences a concern.

Demographic Characteristics— Panel B of Figure 2 shows no significant differences between aligned and non-aligned municipalities in terms of total population, income inequality (measured by the Gini coefficient), overall crimes, environmental crimes, or crimes specifically related to deforestation. While we do observe significant differences in rurality and poverty incidence, we do not consider these to pose threats to identification. This is because the share of registered voters and the likelihood of the incumbent winning are similar across groups, suggesting that these demographic differences do not systematically influence the electoral process.

Figure 2. Local Continuity Assumption



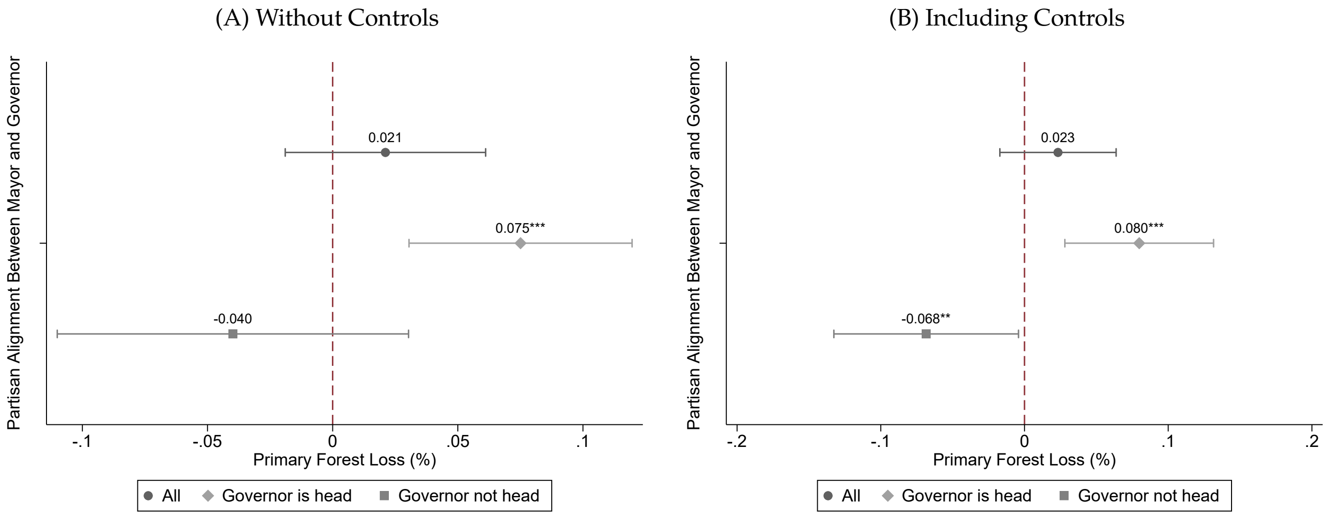
Notes: The figure presents the balance of characteristics in the pre-treatment period between municipalities where the aligned candidate won and those where they lost in the previous election. Each point estimate corresponds to a regression estimating equation (1), using the standardized version of the variable on the y-axis as the dependent variable. Panel A displays geographic characteristics, Panel B presents demographic characteristics, and Panel C reports economic characteristics. All results consider a lineal polynomial in the running variable and triangular kernel. Reported confidence intervals are 95% and are clustered at the municipality level.

Economic Characteristics— Panel C of Figure 2 shows no significant differences in municipal GDP, night light density, fiscal performance, coca cultivation area, cattle density (heads per square kilometer), or primary forest loss in the pre-period. However, we find a significant difference in royalties received and total public investment at the municipal level. Nonetheless, we do not consider these differences a concern, as public investment in environmental initiatives does not differ between aligned and non-aligned municipalities.

V MAIN RESULTS

Figure 3 presents the results of estimating equation (1). The results indicate that partisan alignment between mayor and governor has a positive and statistically significant effect on the annual primary forest loss. Moreover, this effect is concentrated in municipalities governed by a REPA board whose director is the governor, as illustrated in Panel (A) of Figure 3. In these municipalities, the difference in deforestation rates between those with and without partisan alignment between mayors and governors is .075 percentage points, corresponding to an increase of almost 60% relative to the sample mean. Table A.1 presents more details regarding the main results.[15]

Figure 3. Effect of Partisan Alignment on Primary Forest Loss in Close Elections



Notes: The figure illustrates coefficients of estimating equation (1) in three samples. The first circular coefficient is the effect of partisan alignment on deforestation in all municipalities. The second rombus coefficient is the effect of partisan alignment on deforestation in municipalities where the governor serves as the REPA director. The third square coefficient is the effect of partisan alignment on deforestation in municipalities where the governor does not serve as the REPA director. Panel A presents the results without controls, while Panel B includes as controls the baseline variables that were significantly different between aligned and non-aligned municipalities. All results consider a lineal polynomial in the running variable and triangular kernel. The figure includes 95% confidence intervals clustered at the municipality level.

To assess the robustness of our findings, we conduct three exercises. First, we re-estimate equation 1 using alternative bandwidths and polynomial orders. As shown in Figure A.5, the results are stable across bandwidths ranging from 3 to 30 percentage points of vote margin. Second, in Panel (B) of Figure 3, we include as controls the baseline variables that were significantly different between aligned and non-aligned municipalities, as identified in Section IV. Under this specification, the estimated effect of partisan alignment on deforestation increases to 0.08 percentage points. Lastly, we re-estimate equation (1) at the munici-

[15] This corresponds to an average annual increase in primary forest loss of approximately 53 km² or 5,300 hectares. Given that the average municipality in the sample had 577 km² of primary forest cover in 2000, this loss represents nearly 6,720 soccer fields worth of deforested area.

pal–electoral term level, rather than the municipal–year level, to capture total primary forest loss over the full term of the aligned candidate. The results are consistent with our main findings, showing an estimated effect of 0.250 percentage points for the subsample where the governor serves as the REPA head (see Figure A.6 and Panel B of Table A.1). This magnitude is four times larger, reflecting the fact that the electoral term spans four years.

Since all results indicate that deforestation is higher in municipalities governed by the governor's own political party when the governor serves as REPA board director, we interpret this as evidence that the marginal private gains from an additional unit of deforestation are greater when allocated to co-partisan municipalities than to those governed by other parties.

Finally, partisan alignment between mayors and governors in municipalities where the governor serves as REPA board director also has a significant impact on biodiversity intactness, as shown in Figures A.7 and B.5. The results indicate that the effect on biodiversity mirrors that on deforestation, with a 2.6 percentage point decline in biodiversity intactness—equivalent to a 5% decrease relative to the sample average. Although the estimates are noisier due to the limited frequency of biodiversity data, which is available only every five years, the findings remain robust across alternative bandwidth choices (Figure B.6).

VI MECHANISMS

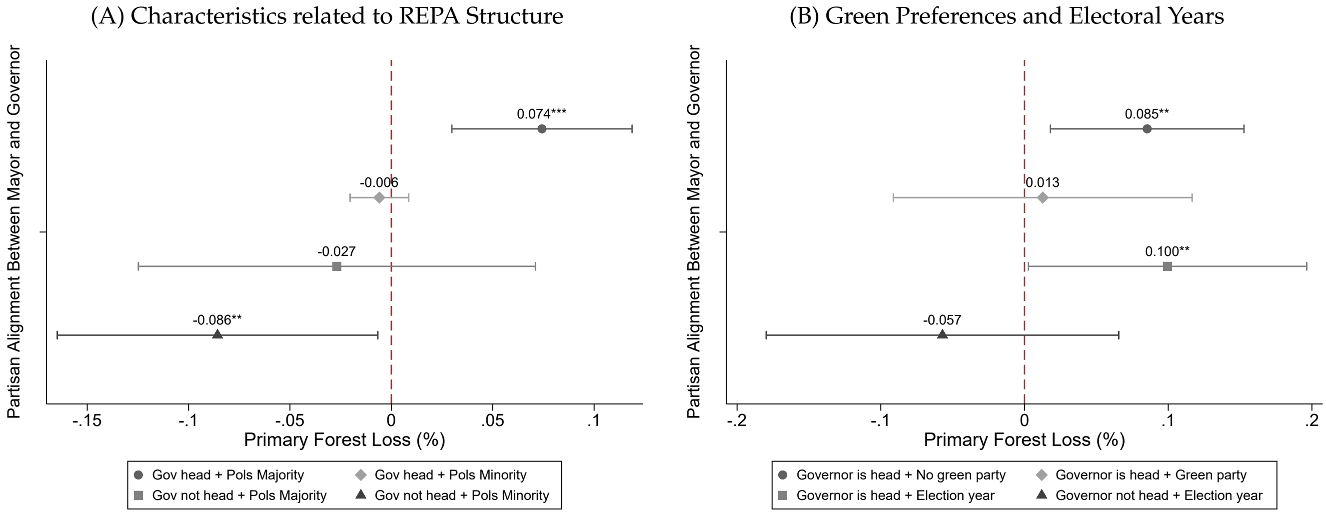
VI.A REPA Board Composition and Preferences

Regarding the underlying mechanisms, we first explore whether the increase in primary forest loss due to partisan alignment between the mayor and governor is driven by municipalities under the jurisdiction of a REPA whose board has a majority of politicians. Second, we test whether the effect on forest loss is concentrated in municipalities under a REPA where the governor serves as board director but does not have green preferences. Finally, we explore whether the effect is stronger in municipalities under a REPA where the governor is the director during an election year. Table A.2 presents formal estimates of equation (1) after splitting the sample according to these scenarios.

In the first scenario, we find that the effect of partisan alignment on forest loss is primarily driven by municipalities under a REPA whose board is composed mostly of politicians. Panel (A) of Figure 4 shows that in this subsample of municipalities, where politicians hold the majority of seats on the REPA board and the governor is director, partisan alignment leads to a significant increase in forest loss of 0.074 percentage points when comparing aligned municipalities to non-aligned ones. In contrast, we find no evidence of a partisan alignment effect in municipalities where politicians are a minority on the REPA board.

We argue that this provides evidence that a higher proportion of politicians on the board increases the likelihood that the governor, as director, faces fewer constraints, resulting in a greater allocation of deforested units to municipalities governed by the same party.

Figure 4. Effect of Partisan Alignment on Primary Forest Loss in Close Elections by Different Characteristics



Notes: The figure presents coefficients of estimating equation (1) in different samples to illustrate mechanisms. Panel (A) shows how the effect of partisan alignment on deforestation varies depending on the composition of the REPA board and its director. Panel (B) shows how the effect of partisan alignment on deforestation varies depending on the preferences over the environment of the REPA board director and whether it is an election year. All results consider a lineal polynomial in the running variable and triangular kernel. The results include 95% confidence intervals clustered at the municipality level.

Secondly, we test whether deforestation should be driven by municipalities under a REPA board where the majority of politicians have browner preferences. To examine this, we focus on municipalities governed by a REPA where the director is the governor and test whether the effect of partisan alignment comes from a preference gap over environmental policy between politicians and non-politicians on the board. To do so, we make two assumptions. First, we assume that non-politicians board members have more pro-environmental preferences (green), based on the fact that this group is primarily composed of indigenous representatives, NGO members, and academics. Second, since individual preferences of board politicians are unobservable, but the governor's preferences can be identified easily through her party, we assume that the governor's stance on environmental policy reflects that of the politicians on the board.

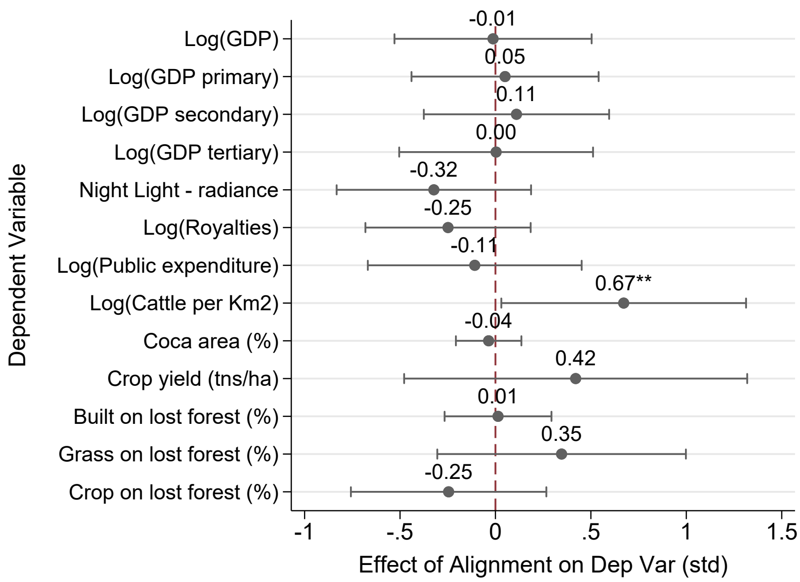
Panel (B) of Figure 4 shows that the effect of partisan alignment is significant only in municipalities under a REPA where the director is the governor and holds browner preferences. This finding supports the idea that as the share of politicians with dirtier preferences increases, more deforested units get allocated to municipalities governed by the governor's party.

Finally, we hypothesize that as the private gains for a non-compliant director increase, more deforestation permits will be allocated to the actor offering the highest returns at the time—specifically, the director's own political party. To test this, we examine whether the effect of partisan alignment intensifies during election years. The results in Panel (B) of Figure 4 suggest that this effect is indeed stronger during electoral years in municipalities where the governor serves as the REPA board director.

VI.B Where do the economic gains from deforestation go?

To assess whether our main findings reflect a case of optimal deforestation driven by political and citizen preferences for economic growth over environmental conservation—or instead a case of political capture of REPAs for private gain—we propose the following hypothesis. If deforestation is indeed optimal, we should observe positive effects of partisan alignment on economic outcomes in municipalities where the aligned candidate won and deforestation increased. In this scenario, forest loss would be accompanied by greater economic activity and increased public investment. Conversely, if the pattern reflects elite capture of REPA boards, we would expect no economic benefits—or even negative effects—despite the rise in deforestation.

Figure 5. Effect of Partisan Alignment on Economic Outcomes in Close Elections



Notes: The figure presents the effect of partisan alignment on various economic outcomes in close elections. Each point estimate corresponds to the coefficients of estimating equation (1) in the main sample, where the dependent variable is the standardized version of the economic variable on the y-axis. All results consider a lineal polynomial in the running variable and triangular kernel. The figure includes 95% confidence intervals clustered at the municipality level.

Figure 5 presents the effect of partisan alignment on economic outcomes, comparing municipalities where the aligned candidate won to those where the aligned candidate barely lost. We find no evidence of positive effects on economic activity—as measured by night light density, municipal GDP, or public investment. If anything, the effects appear negative. The only variable that increases is cattle density. From 2014 onward, we also find that most deforested land is converted to pasture rather than crops, pointing to cattle ranching as the main driver of forest loss.

This pattern aligns with broader structural issues in Colombia. The country has high levels of inequality in income and land ownership, with the top 10% of landowners controlling 80% of private rural land IGAC (2023). Land is also heavily overused for cattle: more than 34 million hectares are used for livestock, despite only 15 million being suitable for it DNP (2020a). Since cattle ranching in Colombia is often dominated by elites and not directly taxed, our findings suggest that deforestation is not translating into shared economic benefits. Instead, it reflects reflects elite capture of REPA boards for private gain.

Finally, we examine whether partisan alignment increases the likelihood of the governor's party being re-elected at the municipal level. We do this by estimating equation (1) at the municipal-electoral term level. Figure B.7 provides suggestive evidence in this direction.

VII MODEL

To rationalize our findings, we present a simple model that captures the fundamental tension between a principal and an agent who has personal incentives to deviate from the mandated policy. In this context, we define each REPA board as the principal and its director as the agent.

VII.A Environment and Timing

Consider a game with two players, $i \in \{b, g\}$, and two time periods, $t \in \{1, 2\}$. Player b represents the REPA board, while player g represents its director. The board consists of an odd number of members, who can be either politicians (P) or non-politicians (NP). The proportion of politicians on the board is determined by law and denoted by π.

In the first period, the board sets a deforestation goal d^b based on the ideal level of deforestation in the absence of agency problems, d^m. Accordingly, the board derives utility from how close the goal is to its preferred level of deforestation, as well as from the extent to which the director complies with the policy. The probability of the director not complying is given by η, which increases monotonically with π. We explicitly assume that it becomes easier for a board director to be non-compliant when the board contains more politicians.

In the second period, the director determines both the total number of actual deforestation units, d^g, and their allocation across actors ($j \in \{1, 2\}$), based on her personal gains from deviating from the policy (γ_j) and the cost of doing so (φ). If the director is fully compliant, she will implement the policy as intended, setting $d^g = d^b$. However, if non-compliant, she will opt for a level of deforestation that exceeds the board's policy $d^g > d^b$.

VII.B Strategies and Payoffs

The board faces the following maximization problem in the first period:

$$max_{\{d^b\}} u^b = -(d^m - [d^b + \eta(d^g - d^b)])^2$$

Where d^m is the board's ideal deforestation level, d^b is the policy set by the board, and d^g is the actual deforestation level chosen by the director.

The REPA director faces the following maximization problem in the second period:

$$\max_{\{d_1^g, d_2^g\}} u^g = \gamma_1 d_1^g + \gamma_2 d_2^g - \frac{\varphi}{2}\left[\left(d_1^g - \frac{d^b}{2}\right)^2 + \left(d_2^g - \frac{d^b}{2}\right)^2\right]$$

where γ_1 represents the director's personal gain from deforestation when allocating d_1^g deforestation units to individuals from her political party, while γ_2 captures her personal gain when allocating d_2^g units to other actors. Thus, $d^g = d_1^g + d_2^g$. Additionally, φ is the cost of deviating from the board's deforestation goal. We compare d_i^g to $\frac{d^b}{2}$ under the assumption that the deforestation goal should be distributed equally among both actors.

VII.C Equilibrium Characterization

Solving the game by backward induction, we find that the director's best responses are given by:

$$d_i^{g*} = \frac{\gamma_i}{\varphi} + \frac{d^b}{2} \quad \text{and} \quad d^{g*} = \frac{\gamma_1 + \gamma_2}{\varphi} + d^b \tag{2}$$

Which implies that the director will choose a deforestation level that is directly proportional to her personal gains and inversely proportional to the cost of deviating from the board's policy. Furthermore, equation (2) suggests that changes in the director's overall personal gains will increase the deforestation level chosen by the director. This is consistent with the findings in panel (B) of Figure 4, as election years are likely to increase the director's private gains per unit of deforestation.

Additionally, the distribution of deforestation units between the director's political party and other actors will depend on the relative gains from deforestation, $(d_1^g - \frac{d^b}{2}) = \frac{\gamma_1}{\gamma_2}(d_2^g - \frac{d^b}{2})$. Thus

Proposition 1. Municipalities where there is partisan alignment between mayor and governor should have higher deforestation rates: $d_1^{g*} > d_2^{g*} \quad \text{iff} \quad \gamma_1 > \gamma_2$

Proposition 1 suggests that the director will allocate more deforestation units to her political party if the personal gains from doing so are higher than those from allocating units to other actors. This result aligns with the motivational fact in Figure 1 and our main results, Panel (B) of Figure 3.

In terms of the board's best response to the director's actions, we find that the optimal policy is given by:

$$d^{b*} = d^m - \eta\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right) \tag{3}$$

As a result, the board will establish a deforestation goal that is directly proportional to its preferred level of deforestation and inversely proportional to the likelihood of the director being non-compliant. The latter occurs since the board accounts for the expected deviation from the policy, given that the director has personal incentives to increase deforestation when private gains from it are positive.

VII.D Comparative Statics

To analyze how the proportion of politicians influences the board's deforestation policy, we consider two scenarios. In the first, all members have homogenous preferences over deforestation levels, $d^m = d$. In the second, politicians and non-politicians have distinct preferences, d^P and d^{NP}, respectively. In which case, the board's median preferred deforestation level is given by $d^m = \pi d^P + (1-\pi)d^{NP}$.

In the first case, the effect of the proportion of politicians on the board's policy is given by:

$$\frac{dd^{b*}}{d\pi} = -\frac{d\eta}{d\pi}\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right)$$

As a result, increasing the proportion of politicians on the board always lowers the deforestation goal set by the board. This occurs because adding a politician increases the probability that the director does not comply, leading to greater deviations from the board's intended policy. To mitigate this, the board responds by setting a more conservative deforestation goal.

In the second case, adding another politician to the board benefits members who prefer d^P, as the median preferred deforestation level shifts closer to their preference. Consequently, the impact of the proportion of politicians on the board's policy is ambiguous:

Proposition 2. Heterogeneous preferences of members: Deforestation should be higher in municipalities where the board has a larger proportion of politicians with non-green (brown) preferences:

- $\frac{dd^{b*}}{d\pi} < 0 \quad \text{iff} \quad (d^P - d^{NP}) < \frac{d\eta}{d\pi}\left(\frac{\gamma_1+\gamma_2}{\varphi}\right)$
- $\frac{dd^{b*}}{d\pi} > 0 \quad \text{iff} \quad (d^P - d^{NP}) > \frac{d\eta}{d\pi}\left(\frac{\gamma_1+\gamma_2}{\varphi}\right)$

Proposition 2 suggests that the effect of the proportion of politicians on the board's policy depends on the preference gap between the two types of members. If the difference in deforestation preferences between politicians and non-politicians is small, the board will set a lower deforestation goal as the proportion of politicians increases. This is because the costs of having a non-compliant director outweigh the benefits of adding another politician to the board. However, if the preference gap is large, the board will set a higher deforestation goal as the proportion of politicians increases. In this case, the benefit of shifting the median preferred deforestation level closer to the politicians' preference outweighs the cost of a non-compliant director.

Assuming that non-politician board members prefer lower deforestation levels than politicians, one prediction of the model is that the greener the politicians are, the lower the deforestation goal set by the board as their proportion increases. Conversely, the browner the politicians are, the higher the deforestation goal set by the board as their proportion increases.

This prediction implies that deforestation should be higher in municipalities where the board includes a greater share of politicians with browner preferences. We argue that results in Figure 4 are consistent with Proposition 3, as deforestation is concentrated in municipalities under a REPA whose board has a majority of politicians and where the governor, acting as director, holds browner preferences.

VIII CONCLUSION

Throughout this article, we have used the case of Colombia to explore how local politicians influence regional environmental authorities, leading to higher levels of deforestation. Employing a regression discontinuity design in close mayoral elections, we found that partisan alignment between mayors and governors increases annual deforestation by an average of 5,300 hectares, particularly in municipalities where the governor serves as the REPA director. This effect is amplified when the REPA board has a majority of politicians with weaker environmental preferences and during election years. To interpret these results, we developed a theoretical model illustrating how political influence distorts environmental policy implementation.

Our findings contribute to the broader literature on the political economy of environmental governance by showing that decentralized environmental authorities may be particularly vulnerable to political capture. The results indicate that partisan alignment creates incentives for elected officials to prioritize short-term political gains over long-term sustainability. This reinforces the argument that institutional safeguards are essential to prevent political interference from undermining conservation efforts. Moreover, the evidence of increased deforestation during election years highlights the need for policies that insulate environmental decision-making from political cycles.

More broadly, these results underscore the importance of designing institutional frameworks that align environmental governance with long-term conservation goals rather than short-term political incentives. As Colombia and other tropical forest nations continue to refine their environmental policies, lessons from this study can inform strategies to enhance institutional resilience against political pressures.

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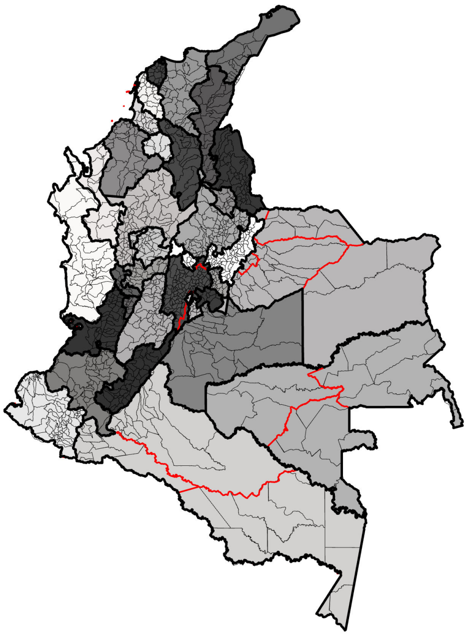
A APPENDIX

A.I Figures

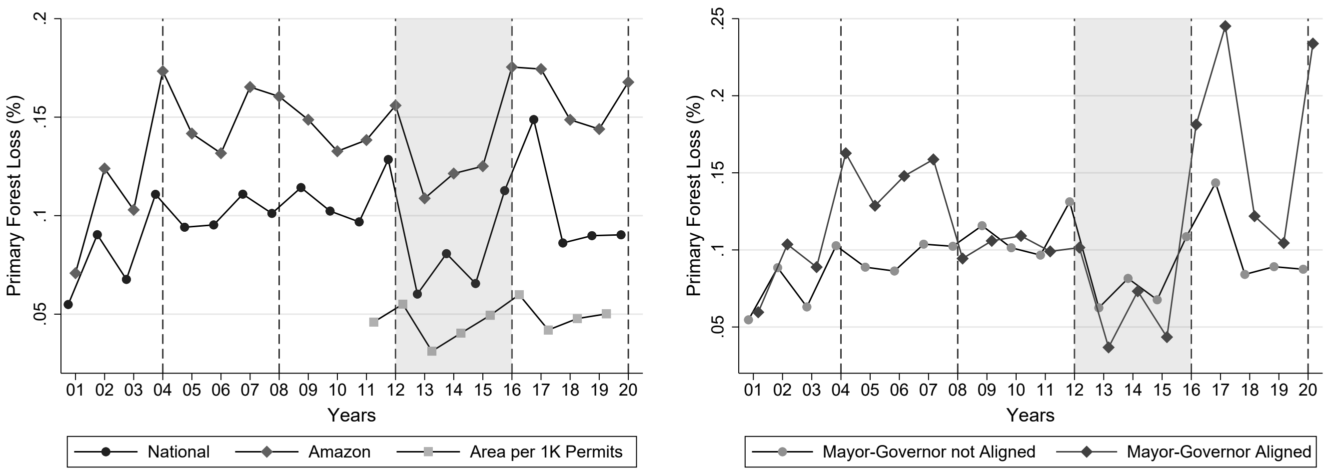
Figure A.1. Spatial Distribution of REPA and Department Jurisdictions



Notes: The figure shows in black the boundaries of each environmental authority, in light gray the municipalities' boundaries, and in red departmental boundaries when they do not coincide with their respective environmental authority.

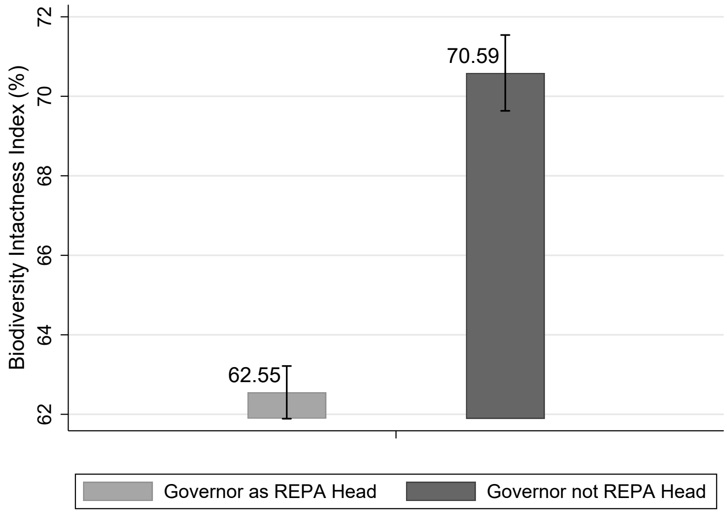
Figure A.2. Evolution of Average Municipal Deforestation in Colombia from 2001 to 2020

(A) Overall Annual Trends (B) Trends by Partisan Alignment



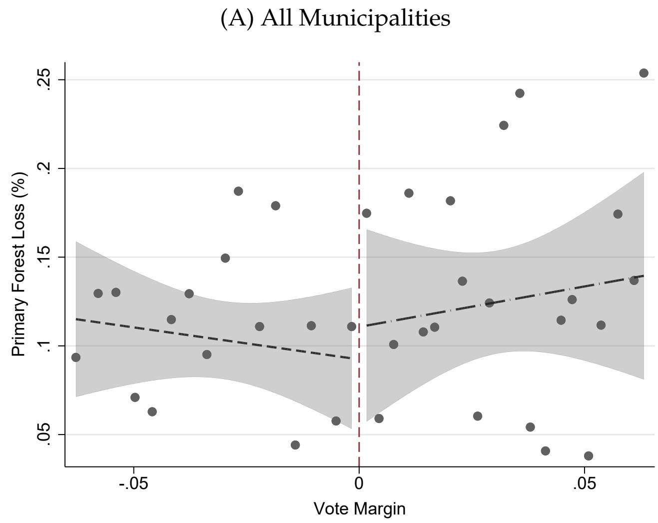
Notes: The figure shows the average annual deforestation rate in Colombia from 2001 to 2020. Deforestation measured as percentage of primary forest in the year 2000. Panel (A) presents the overall trend, while Panel (B) distinguishes between municipalities where the governor serves as the REPA board's director (head) and those where they do not (not head). The shaded area indicates the period of peace negotiations between the Colombian government and the FARC guerrilla group.

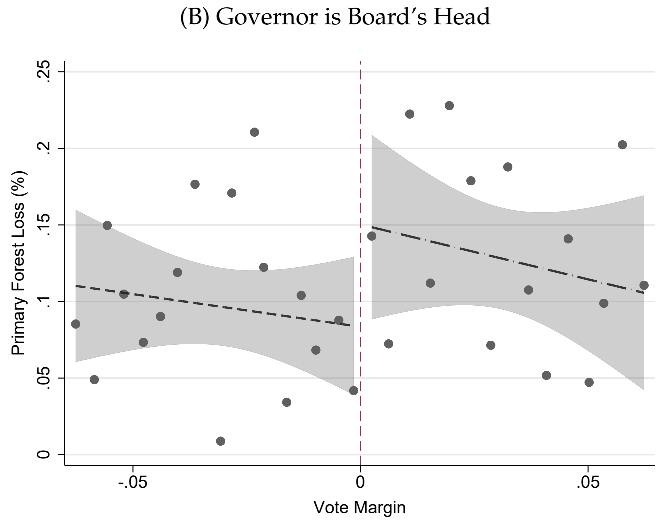
Figure A.3. Biodiversity Intactness Index (BII) by Whether Governor is Board's Head

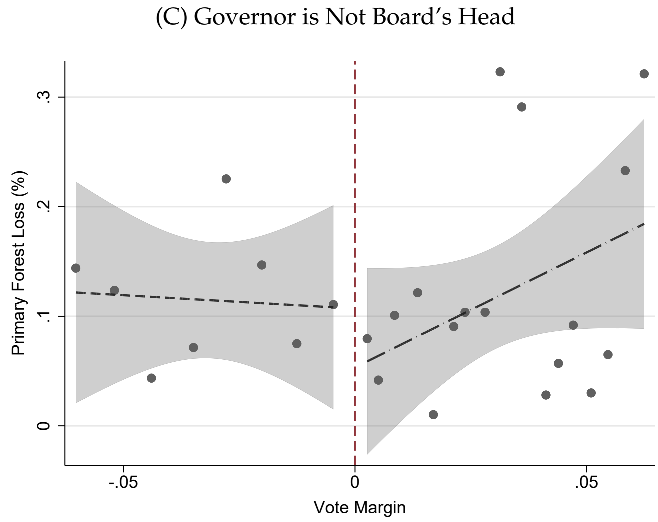


Notes: The figure shows the average biodiversity intactness index (BII) in municipalities where the governor serves as the REPA board's director (head) and where they do not (not head). The BII is a measure of biodiversity loss, with lower values indicating greater loss. The figure includes 95% confidence intervals clustered at the municipality level.

Figure A.4. Regression Discontinuity Plot of Primary Forest Loss in Close Elections



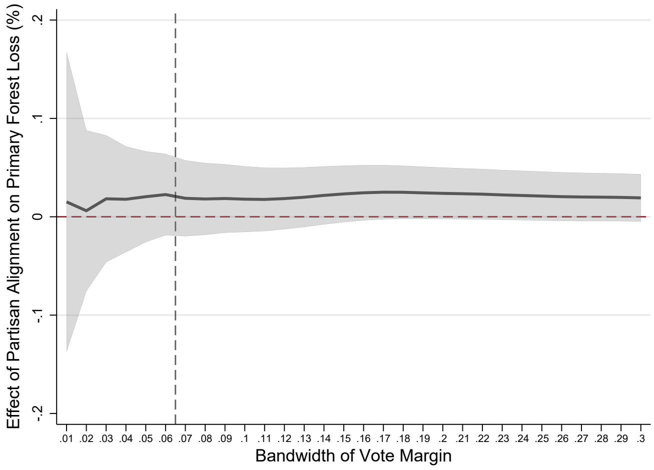




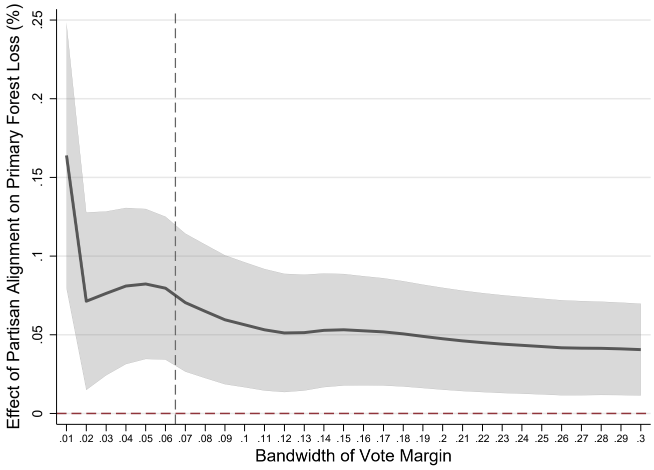
Notes: The figure presents the regression discontinuity design (RDD) plot of the effect of partisan alignment on deforestation of primary forest in close elections for our window of 6 pps. The first panel shows the results for all municipalities, while the second and third panels distinguish between municipalities where the governor serves as the REPA board's director (head) and those where they do not (not head). The figure includes 95% confidence intervals clustered at the municipality level.

Figure A.5. Effect of Partisan Alignment on Primary Forest Loss in Close Elections under Different Bandwidths

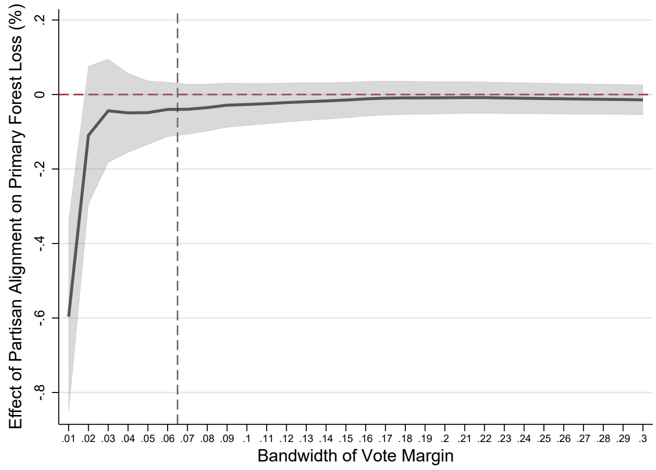
(A) All Municipalities



(B) Governor is Board's Head

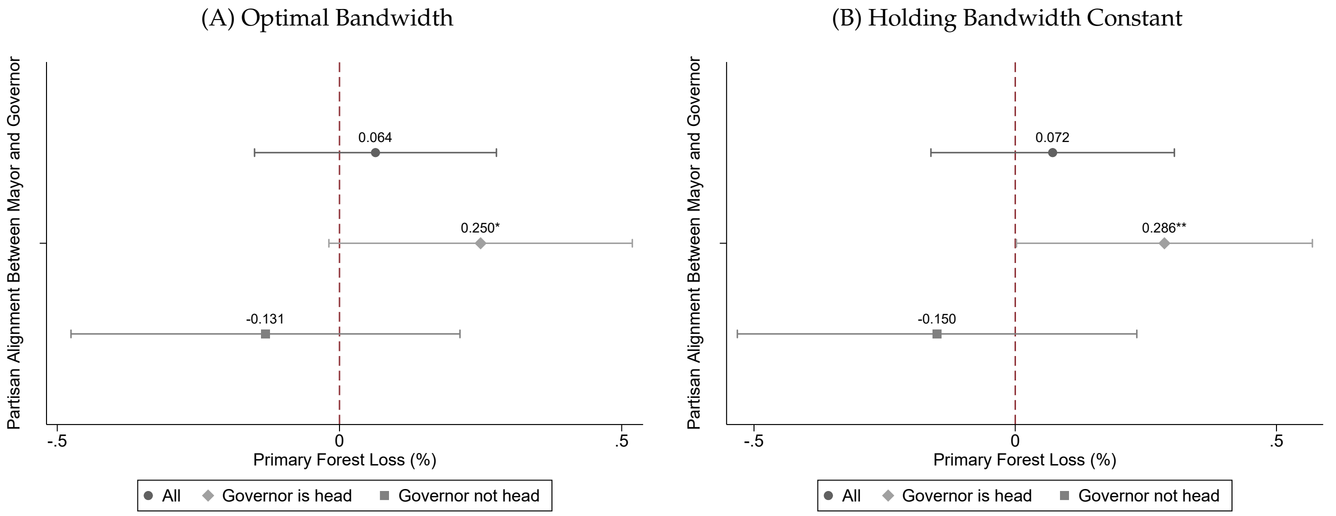


(C) Governor is Not Board's Head



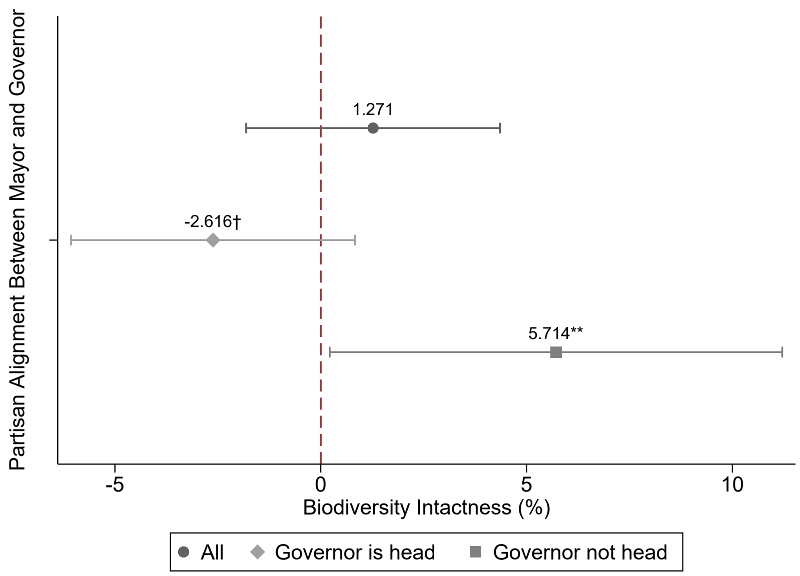
Notes: The figure shows the point estimate of the effect of partisan alignment on deforestation by estimating equation (1) under different bandwidths. The first panel presents the results for all municipalities, while the second and third panels distinguish between municipalities where the governor serves as the REPA board's director (head) and those where they do not (not head). The figure includes 95% confidence intervals clustered at the municipality level.

Figure A.6. Effect of Partisan Alignment on Primary Forest Loss at the Municipal–Electoral Term Level



Notes: The figure shows the effect of partisan alignment on deforestation when estimating equation (1) at the municipal-electoral term level instead of the municipal-year level. Panel (A) presents the results using the optimal bandwidth, while Panel (B) holds the bandwidth constant at 6 pps -the one used in our main results. In both panels, the first circular coefficient is the effect of partisan alignment on deforestation in all municipalities. The second rombus coefficient is the effect of partisan alignment on deforestation in municipalities where the governor serves as the REPA director. The third square coefficient is the effect of partisan alignment on deforestation in municipalities where the governor does not serve as the REPA director. The figure includes 95% confidence intervals clustered at the municipality level.

Figure A.7. Effect of Partisan Alignment on Biodiversity Intactness (BII) in Close Elections



Notes: The figure shows the effect of partisan alignment on BII under three different samples. The first circular coefficient is the effect of partisan alignment on deforestation in all municipalities. The second rombus coefficient is the effect of partisan alignment on deforestation in municipalities where the governor serves as the REPA director. The third square coefficient is the effect of partisan alignment on deforestation in municipalities where the governor does not serve as the REPA director.

A.II Tables

Table A.1. Effect of Partisan Alignment on Primary Forest Loss in Close Elections

Panel A: results at municipal-year level			
	Primary Forest Loss (%)		
	All	Governor is head	Governor not head
	(1)	(2)	(3)
Partisan Alignment	0.021	0.075***	-0.040
	(0.020)	(0.023)	(0.036)
Observations	1236	713	522
Dependent mean	.11	.11	.12
Bandwidth	.065	.065	.065
Panel B: results at municipal-electoral term level			
	All	Governor is head	Governor not head
	(4)	(5)	(6)
Partisan Alignment	0.064	0.250*	-0.131
	(0.109)	(0.136)	(0.174)
Observations	373	212	161
Dependent mean	.41	.41	.41
Bandwidth	.078	.078	.078

Notes: The table presents the effect of partisan alignment on deforestation in close elections. Panel A shows coefficients when estimating equation (1) at the municipal-year level, while Panel B shows coefficients at the municipal-electoral term level. Both estimations consider a lineal polynomial in the running variable and triangular kernel as part of the specification. The first and fourth columns show the results for all municipalities. The second and fifth columns show the effect of partisan alignment on deforestation in municipalities where the governor serves as the REPA board's director (head). The third and sixth columns show the effect of partisan alignment on deforestation in municipalities where the governor does not serve as the REPA board's director (not head). The results include 95% confidence intervals clustered at the municipality level.

Table A.2. Effect of Partisan Alignment on Primary Forest Loss in Close Elections by Different Characteristics

Panel A: characteristics related to REPA structure

	Primary Forest Loss (%)			
	Governor is head + Pols Majority	Governor is head + Pols Minority	Governor not head + Pols Majority	Governor not head + Pols Minority
	(1)	(2)	(3)	(4)
Partisan Alignment	0.074***	-0.006	-0.027	-0.086**
	(0.023)	(0.007)	(0.050)	(0.040)
Observations	661	52	386	136
Dependent mean	.12	.02	.13	.07
Bandwidth	.065	.065	.065	.065

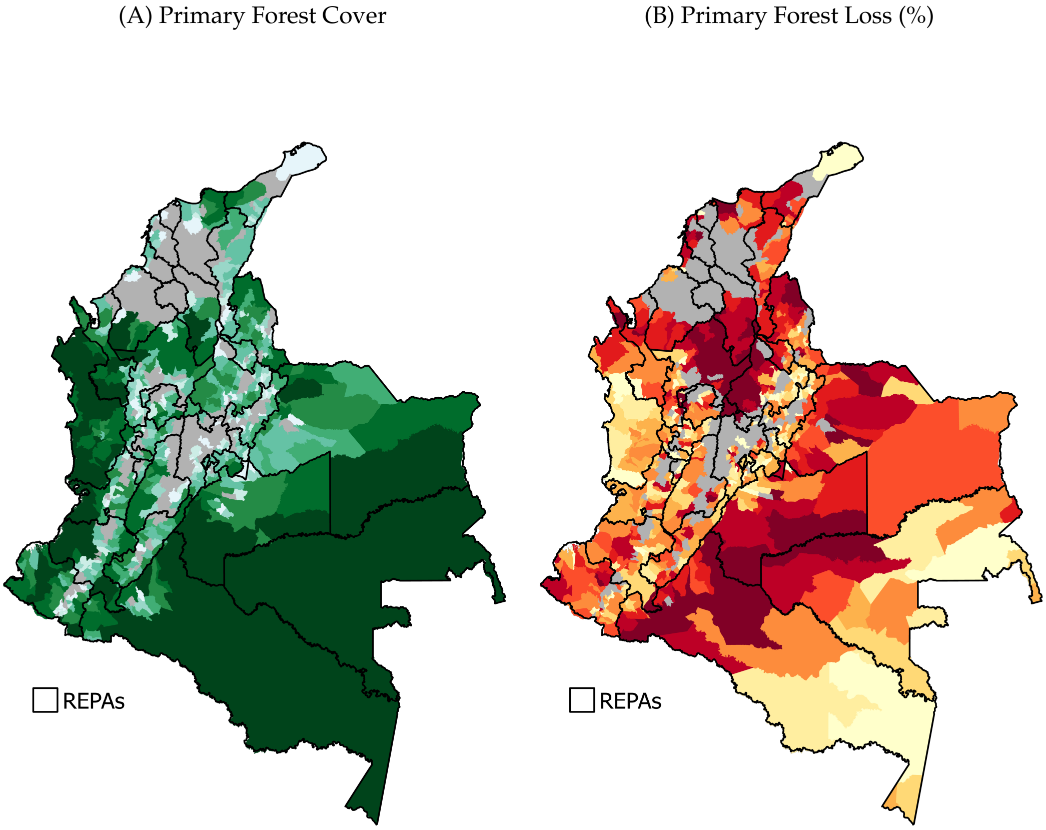
Panel B: green preferences and electoral years

	Governor is head + No green party	Governor is head + Green party	Governor is head + Election year	Governor not head + Election year
	(5)	(6)	(7)	(8)
Partisan Alignment	0.085**	0.013	0.100**	-0.057
	(0.034)	(0.052)	(0.049)	(0.062)
Observations	397	137	186	138
Dependent mean	.13	.12	.11	.11
Bandwidth	.065	.065	.065	.065

Notes: The table presents coefficients of estimating equation (1) in different samples to illustrate mechanisms. All results consider a lineal polynomial in the running variable and triangular kernel as part of the specification. Panel A shows how the effect of partisan alignment on deforestation varies depending on the composition of the REPA board and its director. Panel B shows how the effect of partisan alignment on deforestation varies depending on the preferences over the environment of the REPA board director and whether it is an election year. The results include 95% confidence intervals clustered at the municipality level.

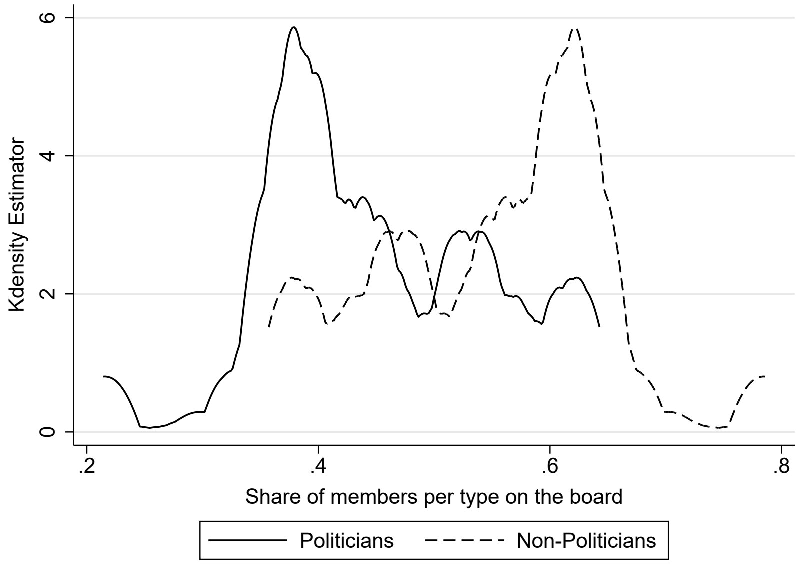
B ONLINE APPENDIX

Figure B.1. Spatial Distribution of Primary Forest Cover and Forest Loss by Municipalities (2001 -2020)



Notes: Panel (A) displays the spatial distribution of total forest cover across municipalities at the baseline year (2000). Panel (B) presents the proportion of primary forest loss between 2001 and 2020. In both panels, municipalities are shaded according to deciles, with each color representing a different decile. Black lines delineate the jurisdictions of REPAs, while light gray areas indicate municipalities with no primary forest at baseline, which are excluded from the analysis.

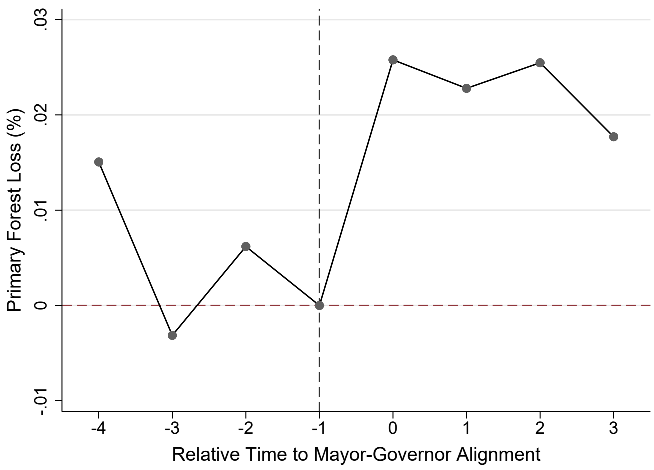
Figure B.2. Share of Politicians vs. Non-Politicians in Committees across REPAs



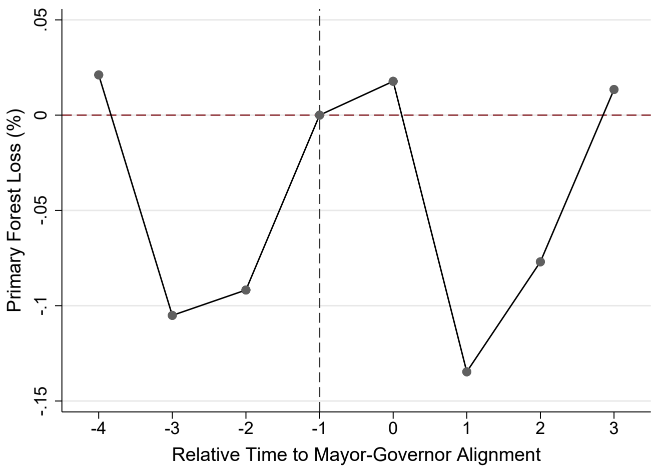
Notes: The figure depicts the distribution of politician and non-politician shares across REPAs. By construction, these shares are complementary, summing to 1 for each REPA.

Figure B.3. Changes in Primary Forest Loss Before and After Political Alignment Between Mayor and Governor

(A) Governor is Board's Head

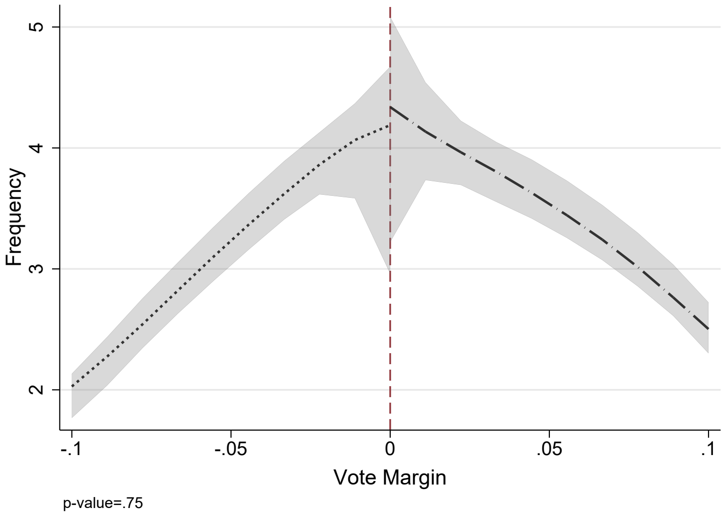


(B) Governor is Not Board's Head



Notes: The figure illustrates changes in average deforestation rates relative to the onset of political alignment between the mayor and the governor. Negative time periods correspond to years during the previous electoral term when the mayor and governor were not aligned. In contrast, positive periods represent years within the term when alignment occurred. All values are normalized to the pre-alignment year. Panel (A) shows the results for municipalities under a REPA where the governor serves as board director, while Panel (B) presents the same for municipalities where the governor does not hold that position.

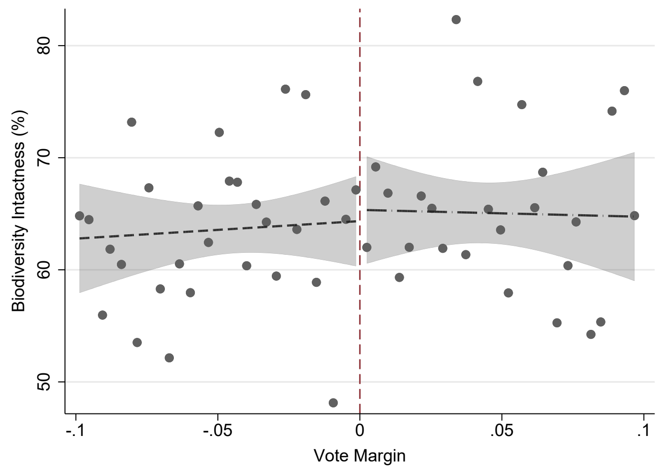
Figure B.4. McCrary test in Close Elections



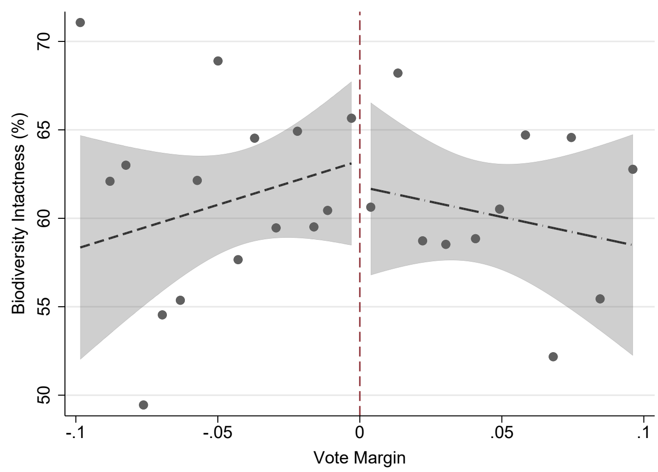
Notes: This graph displays the results of the McCrary test, used to detect potential manipulation of the assignment variable near the threshold. The p-value from the test is reported below the plot.

Figure B.5. RDplot of Biodiversity Intactness in Close Elections

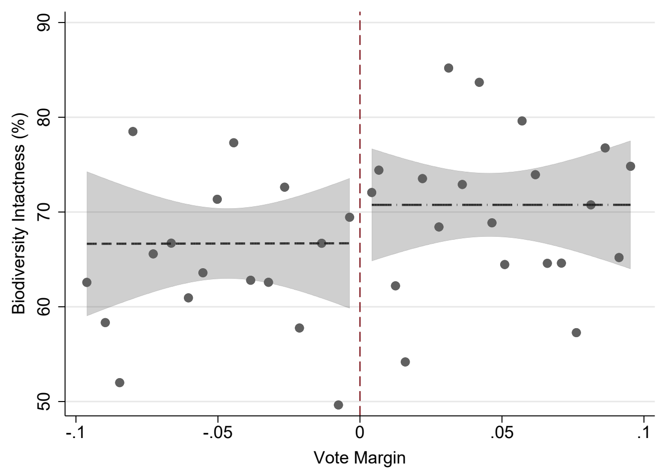
(A) All Municipalities



(B) Governor is Board's Head

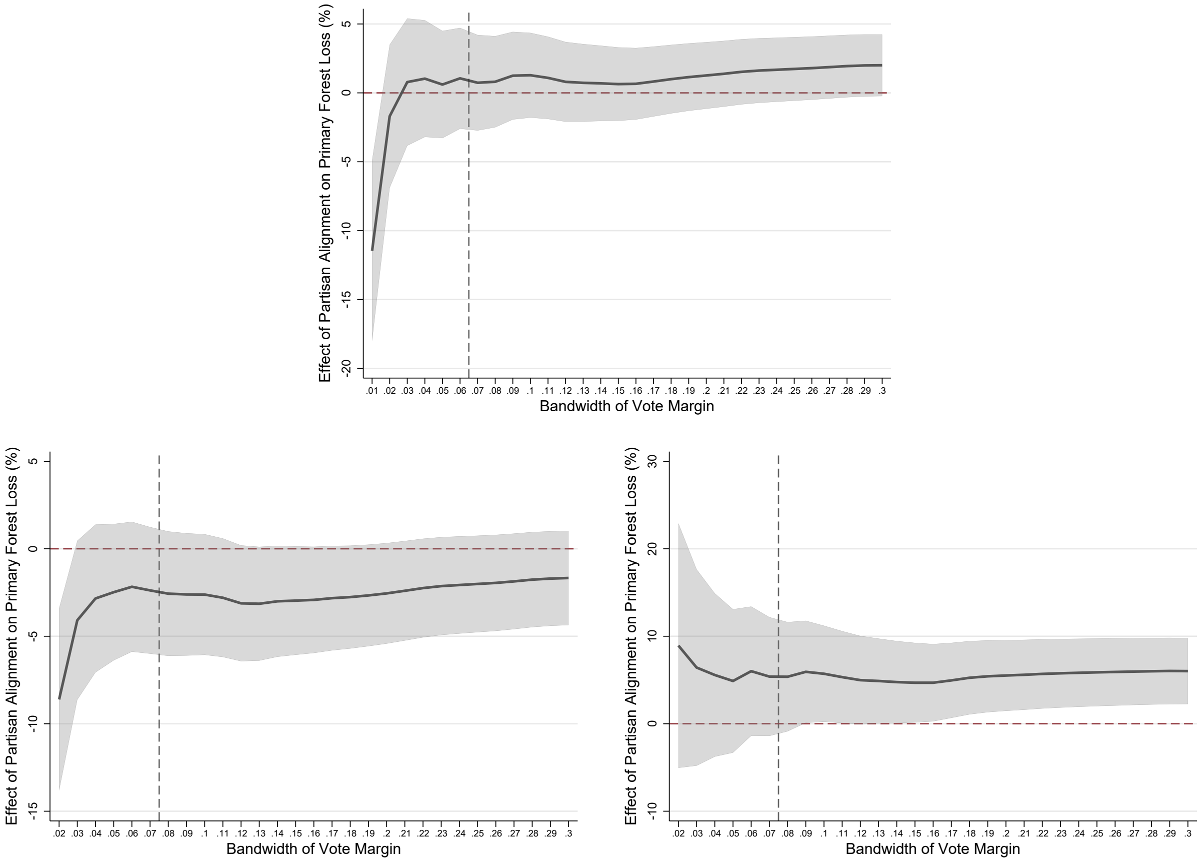


(C) Governor is Not Board's Head



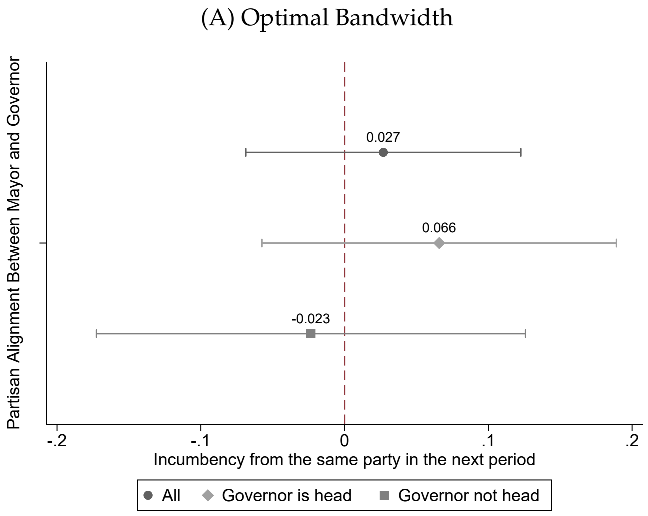
Notes: The figure presents the regression discontinuity design (RDD) plot of the effect of partisan alignment on biodiversity for our window of 6 pps. The first panel shows the results for all municipalities, while the second and third panels distinguish between municipalities where the governor serves as the REPA board's director (head) and those where they do not (not head). The figure includes 95% confidence intervals clustered at the municipality level.

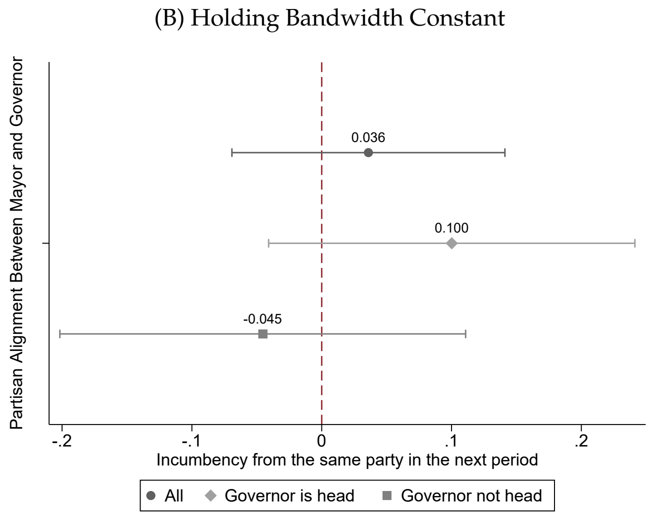
Figure B.6. Effect of Partisan Alignment on Biodiversity Intactness in Close Elections Under Different Bandwidths with Year FEs



Notes: The figure shows the point estimate of the effect of partisan alignment on biodiversity by estimating under different bandwidths. The first panel presents the results for all municipalities, while the second and third panels distinguish between municipalities where the governor serves as the REPA board's director (head) and those where they do not (not head). The figure includes 95% confidence intervals clustered at the municipality level.

Figure B.7. Effect of Partisan Alignment on Reelection of the party in Close Elections-Electoral term level





Notes: The figure shows the effect of partisan alignment on reelection of the party at the municipal-electoral term level. Panel (A) presents the results using the optimal bandwidth, while Panel (B) holds the bandwidth constant at 6 pps -the one used in our main results. In both panels, the first circular coefficient is the effect of partisan alignment on deforestation in all municipalities. The second rombus coefficient is the effect of partisan alignment on deforestation in municipalities where the governor serves as the REPA director. The third square coefficient is the effect of partisan alignment on deforestation in municipalities where the governor does not serve as the REPA director. The figure includes 95% confidence intervals clustered at the municipality level.

Table B.1. Local Continuity Assumption on Geographic Characteristics

	Geographic Characteristics											
	Log(Area Km2)	Agricultural area (sh)	Forest area (sh)	Altitude (masl)	Crop suitability (gaez)	Log(Distance to market Km2)	Biodiversity Intactness (%)	Amazonia region	Orinoquia region	Pacific region	Caribe region	Andean region
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Partisan Alignment	0.146*	-0.064	0.023	-0.255***	0.239**	0.032	0.008	-0.176	-0.138	-0.014	0.083	0.088
	(0.088)	(0.110)	(0.080)	(0.089)	(0.105)	(0.096)	(0.168)	(0.108)	(0.118)	(0.085)	(0.108)	(0.095)
Observations	1865	914	1950	1950	1950	1942	588	1950	1950	1950	1950	1950

Table B.2. Local Continuity Assumption on Demographic Characteristics

	Demographic Characteristics								
	Log(Population in 1993	Poverty incidence in 1993	Rurality index	Gini index	Crime rate (1k inh)	Env. crime rate (10k inh)	Forest crime rate (10k inh)	Register voters (sh)	Incumbent (prob)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Partisan Alignment	0.134	0.180*	0.268**	-0.073	-0.035	0.042	0.098	-0.094	-0.040
	(0.084)	(0.102)	(0.130)	(0.097)	(0.086)	(0.071)	(0.080)	(0.081)	(0.130)
Observations	1946	1765	1003	1765	1003	1003	1003	943	943

Table B.3. Local Continuity Assumption on Economic Characteristics

	Economic Characteristics								
	Log(Total GDP)	Night Light	Fiscal performance Index	Log(Royalties)	Log(Public Investment)	Log(Env. Investment)	Coca area (sh)	Cattle per Km2	Primary Forest loss (sh)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Partisan Alignment	0.129	-0.218	-0.038	0.628**	0.271**	0.045	-0.100	-0.194	0.018
	(0.140)	(0.138)	(0.120)	(0.301)	(0.113)	(0.138)	(0.065)	(0.222)	(0.135)
Observations	564	983	1003	172	1003	862	1003	258	1003

Notes: These tables present the results of the test of Local Continuity Assumption, as shown in Figure 2.

Table B.4. Effect of Partisan Alignment on Biodiversity Intactness in Close Elections

	Biodiversity Intactness Index (%)		
	All	Governor is head	Governor not head
	(1)	(2)	(3)
Partisan Alignment	1.271	-2.616	5.714**
	(1.571)	(1.757)	(2.798)
Observations	1300	701	599
Dependent mean	64.42	60.76	68.71
Bandwidth	.1	.1	.1

Notes: The table presents the effect of partisan alignment on BII under three different samples. The first column shows the results for all municipalities, while the second and third columns distinguish between municipalities where the governor serves as the REPA board's director (head) and those where they do not (not head).

A.III Model Solution

$$u^m = -(d^m - [p + \eta(s-p)])^2$$

$$u^g = \gamma_1 s_1 + \gamma_2 s_2 - \frac{\psi}{2}\left[(s_1 - \frac{p}{2})^2 + (s_2 - \frac{p}{2})^2\right]$$

Solving g problem:

$$[s_i]: \quad \varphi(s_i - \frac{p}{2}) = \gamma_i$$

$$s_i = \frac{\gamma_i}{\varphi} + \frac{p}{2}$$

$$s^* = \frac{\gamma_1 + \gamma_2}{\varphi} + p$$

$$\frac{[s_1]}{[s_2]}: \quad (s_1 - \frac{p}{2}) = \frac{\gamma_1}{\gamma_2}(s_2 - \frac{p}{2})$$

Solving m problem:

$$u^m|_{s^*} = -\left(d^m - \left[p + \eta\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right)\right]\right)^2$$

First order condition for p:

$$[p]: d^m - p - \eta\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right) = 0$$

$$p^* = d^m - \eta\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right)$$

Comparative statics:

- Case 1: Homogeneous preference over d

$$\frac{dp^*}{d\pi} = -\frac{d\eta}{d\pi}\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right) < 0$$

- Case 2: Heterogeneous preference over d

$$d^m = \pi d^P + (1-\pi)d^{NP}$$

$$\frac{dp^*}{d\pi} = (d^P - d^{NP}) - \frac{d\eta}{d\pi}\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right)$$

Then:

$$\frac{dp^*}{d\pi} < 0 \quad \text{iff} \quad (d^P - d^{NP}) < \frac{d\eta}{d\pi}\left(\frac{\gamma_1 + \gamma_2}{\varphi}\right)$$

Thus,

$$\Rightarrow \text{When} \quad (d^P - d^{NP}) \uparrow \quad \Rightarrow \quad \text{more likely} \quad \frac{dp^*}{d\pi} > 0 \quad \text{(No green case)}$$

$$\Rightarrow \text{When} \quad (d^P - d^{NP}) \downarrow \quad \Rightarrow \quad \text{more likely} \quad \frac{dp^*}{d\pi} < 0 \quad \text{(Green case)}$$

C TEMPORAL DYNAMICS

We extend our analysis beyond the regression discontinuity design to test a broader of our analysis using an alternative specification. Specifically, we estimate dynamic treatment effects of deforestation for the whole database using an event-study framework[16]. Figure B.8 shows the results based on the traditional Event Study approach. However, as the recent literature has shown, they can be biased in the presence of heterogeneous effects between groups and time. To address the concern about the forbidden control groups, we adopt the methodology proposed by **?** and **?**, which accommodates staggered treatment adoption and non-absorbing treatments—that is, units may enter and exit treatment over time. In the context, this approach also addresses the issue of negative weighting in traditional two-way fixed effects (TWFE) estimators, as highlighted by **?**. Our specification could be expressed as follows:

$$y_{mt} = \beta_0 + \sum_{j=-3}^{J=0} \gamma_j \mathbb{I}(\text{Mayoraligned})_{mt} + \sum_{j=1}^{J=4} \alpha_j \mathbb{I}(\text{Mayoraligned})_{mt} + \mu_m + \mu_t + \epsilon_{mt} \tag{4}$$

Where each γ_j corresponds to each j estimate in the pre-treatment period, with j subscript representing the relative time before partisan alignment. Similarly, α_j represents the post-treatment estimates, corresponding to the effect of partisan alignment j periods after it started. We also adjust standard errors for clusters at the municipality level.

Table B.5. Effect of Partisan Alignment on Deforestation of Primary Forest in Close Elections-Electoral term

	Primary Forest Loss (%)		
	All	Governor is head	Governor not head
	(1)	(2)	(3)
Partisan Alignment	0.010	0.022*	-0.007
	(0.009)	(0.012)	(0.013)
Observations	6101	3418	2605
Test of joint nullity of the placebos : p-value =	.774	.653	.519

Consistent with previous exercises, we estimate the equation 4 in three distinct samples. Table B.5 shows the average cumulative (total) effect per treatment unit and the result of the testing of the parallel trends and no anticipation assumptions. Panel A of Figure B.9 presents the results for all municipalities, whereas panels B and C display the results for municipalities where politicians do not hold a majority in REPAs' boards and those where they do, respectively. Results support our main findings since most of the significant effect of partisan alignment on deforestation is driven by municipalities where the governor serves as the REPA boars director (Panel B). However, the estimates become noisier due to the disaggregation of the effect by time period, as the number of units switching their treatment status decreases. Finally, in assessing the parallel trends assumption, we observe that the estimates before treatment initiation (γ_j) are not significant, suggesting no anticipation and parallel pre-trends, in other words, that municipalities were similar prior to partisan alignment and can thus be considered comparable groups.

Lastly, we re-estimate equation 4 at the municipal–electoral term level, rather than the municipal–year level, to capture total primary forest loss over the full term of the aligned candidate.[17] The results are consistent (see Figure B.10). This suggests that the impact of partisan alignment on deforestation is not only immediate but also accumulates over the duration of the current and next electoral term.

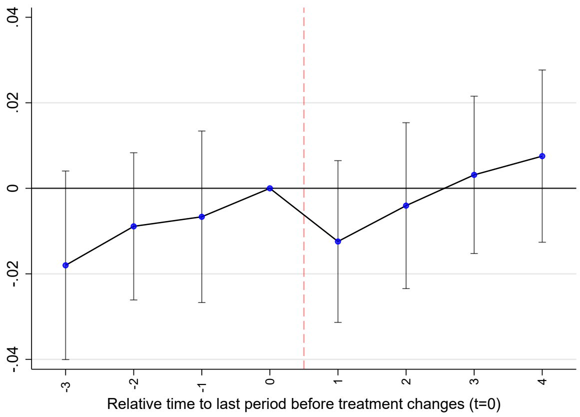
[16]We define the event time following **?** where the t=1 is the first year of treatment. Additionally, we restrict our period analysis to 3 years before the partisan alignment and 4 years after. In other words, we are trimming the database in the range of -3 to 4, following the logic of the years within the political cycle

[17]We define the event time following **?** where the t=1 is the first year of treatment. Additionally, we restrict our period analysis to 2 periods before the partisan alignment and 2 periods after.

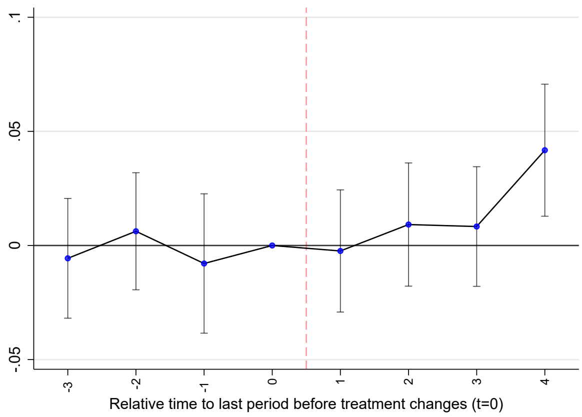
C.A Temporal dynamics -figures

Figure B.8. Temporal Dynamics of Partisan Alignment on Primary Forest Loss-ES traditional

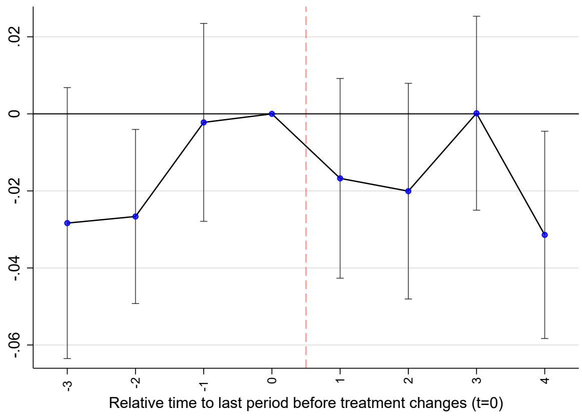
(A) All Municipalities



(B) Municipalities where governor is head



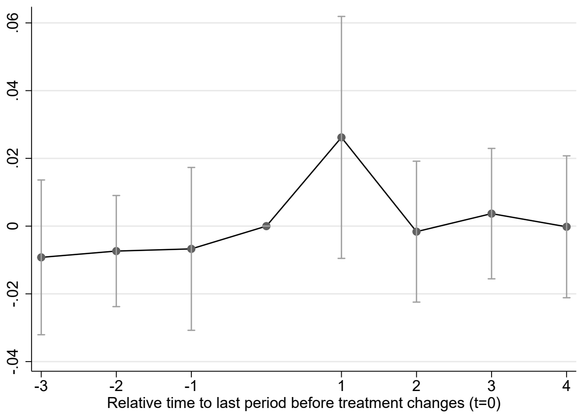
(C) Municipalities where governor is no head



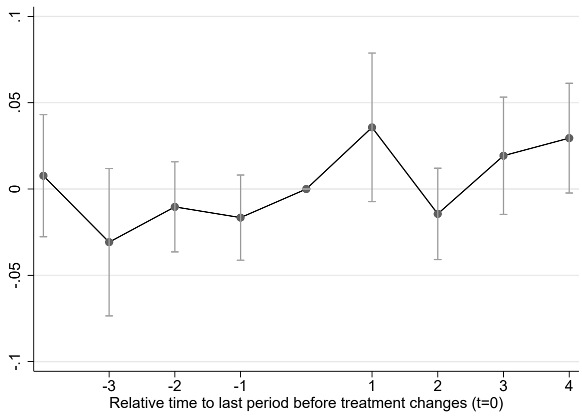
Notes: All three panels show the effect of partisan alignment on yearly deforestation rates following the traditional definition of event study. Panel (A) considers all municipalities in the sample. Panel (B) uses only municipalities in which politicians do not have the majority in their environmental committees. Panel (C) restricts the sample only to municipalities in which politicians have the majority on their REPA's board.

Figure B.9. Temporal Dynamics of Partisan Alignment on Primary Forest Loss

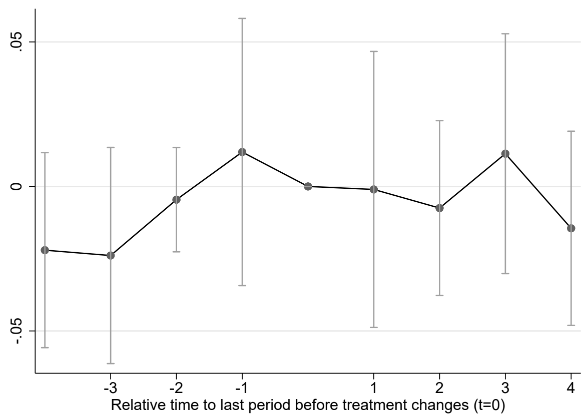
(A) All Municipalities



(B) Municipalities where governor is head

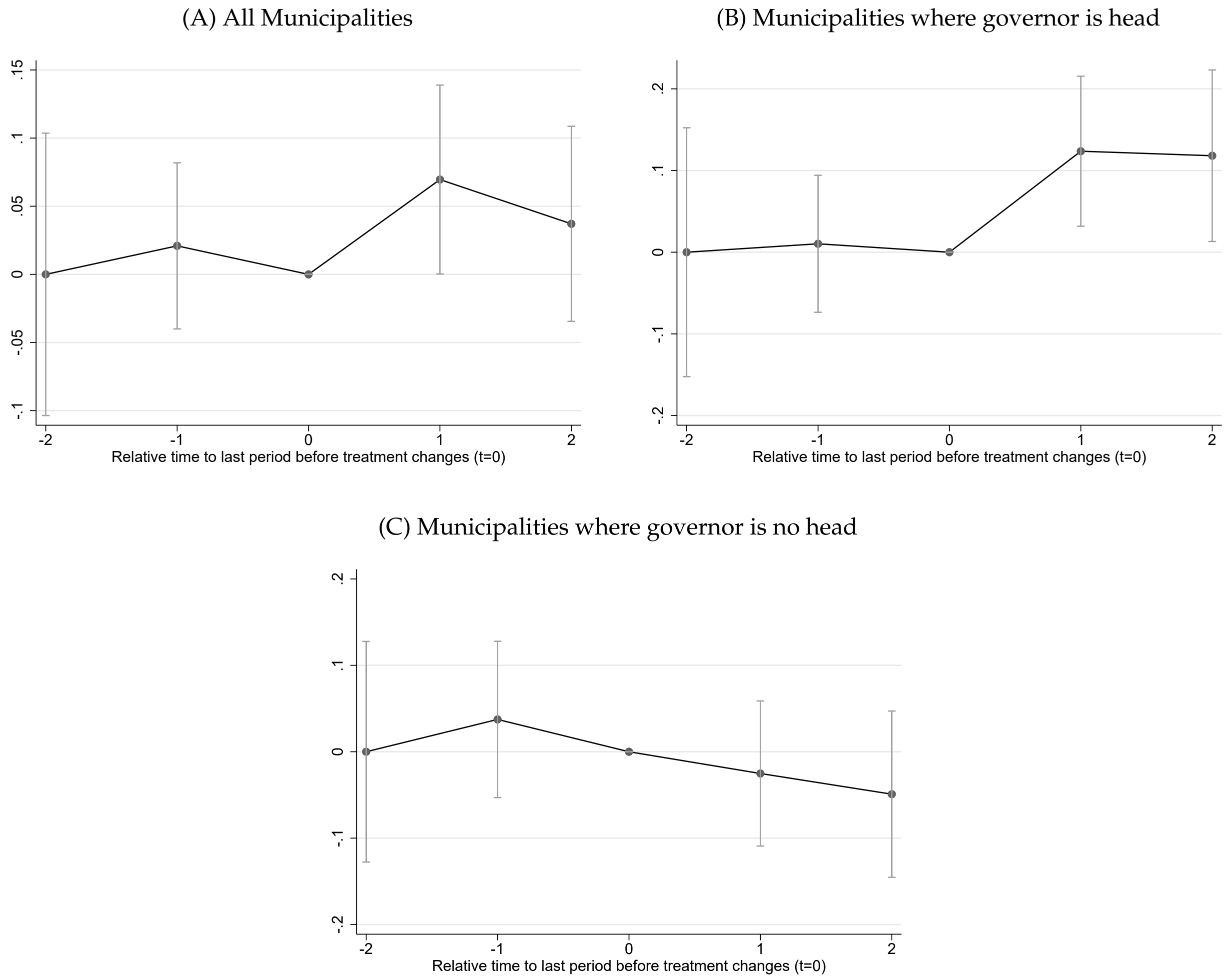


(C) Municipalities where governor is no head



Notes: All three panels show the effect of partisan alignment on yearly deforestation rates (Equation 4). Estimates are calculated using the methodology of **?**, specifically with `did_multiplegt_dyn` last Stata command. Panel (A) considers all municipalities in the sample. Panel (B) uses only municipalities in which politicians do not have the majority in their environmental committees. Panel (C) restricts the sample only to municipalities in which politicians have the majority on their REPA's board.

Figure B.10. Temporal Dynamics of Partisan Alignment on Primary Forest Loss by electoral term



Notes: All three panels show the result of re-estimate equation (1) at the municipal–electoral term level, rather than the municipal–year level, to capture total primary forest loss over the full term of the aligned candidate. Estimates are calculated using the methodology of **?**, specifically with `did_multiplegt_dyn` last Stata command. Panel (A) considers all municipalities in the sample. Panel (B) uses only municipalities in which politicians do not have the majority in their environmental committees. Panel (C) restricts the sample only to municipalities in which politicians have the majority on their REPA's board.