The electoral effects of Mapuche attacks on highways

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Abstract

Megaprojects are electoral magnets due to their transformative power, but they also raise strong opposition. Using a Regression Discontinuity Design (RDD), this paper assesses the impact on presidential elections of Mapuche attacks and protests at two strategic road infrastructures. Mapuche use a repertoire of non-conventional actions in their struggle with the Chilean state seeking self-determination. Estimations reveal that attacks reduce the likelihood of victory for the governing coalition at nearby polling stations, while protests have no effect. We interpret these results as a contest in the symbolic sphere to oppose the narratives of modernity and unity that highways embody.

Keywords: Megaprojects; RDD; Mapuche; conflict studies; extractivism

JEL Codes: R11, R58, D74

Introduction

In many places in the Global North and South and across different sectors, megaprojects have recently attracted the attention of engineers, planners, politicians and academics because of their huge costs, complexity and the expectations they engender (Kardes et al., 2013; Söderlund et al., 2017). Aside from scale, two features differentiate megaprojects from conventional, smaller-scale projects. The first is their transformative capacity over space and society. These ventures change landscapes rapidly, intentionally, and profoundly in very visible ways, and require coordinated applications of capital and state power (Gellert and Lynch, 2003). They also have profound impacts on the development trajectories of territories. Flyvbjerg (2014) endorses Hirschmann's (1995) words when he points out that megaprojects are "trait making" as they are designed to change the structure of society, as opposed to smaller, "trait taking" projects. The second distinctive feature is their power to cast impressions and articulate a narrative that serves not only to justify their own existence to stakeholders, but to transform society itself. As this special issue highlights, megaprojects are symbolic carriers that put forward imagined futures and visions for regions and localities.

Flyvbjerg (2014) identifies four factors, or sublimes, that drive megaproject development: the *technological sublime,* i.e. the aim of pushing the boundaries of what technology can do; the *economic sublime*, i.e. the delight businesses and trade unions get from making money and creating jobs; the *aesthetic sublime*, i.e. the pleasure people get from their beauty; and the *political sublime*, i.e., the rapture politicians get, which helps them in being re-elected. This paper addresses the political sublime. The enormous visibility of megaprojects allows incumbents to project certain values and convey an aura of impressions However, such projects do not always achieve the intended symbolic meaning and they become a locus of political contestation. Rival stakeholder coalitions use their opposition to megaprojects as a means to launch different discourses and symbols to achieve their own goals, thus compromising the electoral desires of those in power.

To shed light on this double-edged nature of megaproject symbolism, this paper explores the attacks and protests on critical communication infrastructure by the indigenous Mapuche in Chile, and their impact on voting in presidential elections. In their struggle against the Chilean state, Mapuche deploy a repertoire of nonviolent and violent actions in the quest for improving their status and gaining greater autonomy. What role do megaproject attacks and protests play for insurgent movements seeking self-determination?

We rely on a case study research design to answer this question. Case study research explores a given phenomenon in its context when the boundary between the phenomenon itself and its context is not clearly delimited (Yin, 2009), which is particularly appropriate for answering *how* and *why* questions about a set of events (Meyer, 2001). The Mapuche conflict is worth researching for several reasons. It is one of the oldest in the Americas, and the dispute intensified in 1990 with the return of democracy in Chile. Since then and until 2022, more than 4,500 conflict events have been reported, including attacks, protests, land invasions and state coercion (Corvalan, 2022), attracting international

attention. This is an indigenous self-determination (SD) conflict in which, as in other indigenous struggles, the Mapuche claim the right to maintain their ancestral territory and their specific cultural and social norms as a nation, which they see as threatened by the forestry industry and a centralising state (Cayul et al., 2022; Rojas Pedemonte and Miranda, 2015). Our focus is on presidential elections because, essentially, it is a fight against the state and the president represents its highest authority.

We use a Regression Discontinuity Design (RDD) design to assess the impact of protests and attacks on the vote in presidential elections. RDD is a quasi-experimental method in which a random event splits units into treated and control areas. In our case, treated areas are the competitive polling stations located close to two infrastructure megaprojects that have suffered numerous protests and attacks by Mapuche: Route 5, that is part of the emblematic Pan-American Highway, and the less well-known but equally strategic coastal Route 180. Our estimations show that protests have no impact, but attacks have a statistically significant negative effect on the winning probability of the governing coalition at polling stations near attacked infrastructure. We interpret these results not only as an attempt to damage electoral prospects, but also as a contest in the symbolic sphere to oppose the narratives of modernity and unity that come with such infrastructure. In the search for the mechanism driving these results, we look at the evolution of voter turnout in conflict-affected areas, and see that turnout is significantly lower in polling stations close to attacks and significantly higher in those affected by protests.

This piece of research brings three new features. First, the paper bridges two areas of research that doubtless deserve more attention from each other (i.e. research on megaproject management and conflict studies), given that they share common interests and new developments may emerge from cross-fertilisation. Second, to the best of the authors' knowledge, this is the first paper to weigh the electoral costs of opposition to megaprojects. Although the scholarship has extensively addressed the social and environmental conflicts that arise (e.g. Gellert and Lynch, 2003; Nagel and Satoh, 2019; Silva et al., 2018), there is no work that we are aware of that explores how this conflict translates into voting patterns. The last contribution is related to the effectiveness of the tactics employed to oppose megaprojects. The literature on SD movements has indicated that, while violent actions also increase the likelihood of obtaining concessions from the state, non-violent mobilisation is more effective (Cunningham, 2023). Although in this paper we do not focus on the concessions gained, our results point in another direction: attacks are effective in damaging the incumbent coalition's electoral chances, while protests do not have a significant impact.

The remainder of the paper is organised as follows. In the next section, we proceed with the theoretical framework regarding the symbolism associated with infrastructure megaprojects. After that, we present stylised facts about the conflict between the Chilean state and the Mapuche. The subsequent part presents the data and the methodology for the empirical analysis. A discussion of the results follows, linking the attacks on infrastructure with a strategy that seeks to dispute the symbolism of these megaprojects. The last section discusses the implications of the results and offers some concluding remarks.

The symbolism of infrastructure megaprojects

Aside from the intended function for which they are built, infrastructures bear impressions and generate meanings that go beyond their material specifications. The production of infrastructure is not an aseptic affair of planners and engineers, it is also an intensely political project involving creating and communicating information (Siemiatycki et al., 2020). Let us consider communication infrastructure to illustrate the point. Roads are not just built for the purpose of connecting people, enhancing trade and promoting regional development, they also bring the promise of modernisation. Communication infrastructure is an archetypical technology of emancipatory modernity, because, although roads have existed in different forms for millennia, the conjunction of engineering expertise, political will and economic ambition for the purpose of integrating the nation state is a modern ambition, which in its current form is strongly influenced by neoliberalism (Harvey and Knox, 2015).

While all infrastructure has a symbolism associated with it, given its monumentality, megaprojects are privileged material forms in terms of conveying narratives and building imaginaries. Megaprojects are modern symbols of prestige, progress, and political power, crucial for the encapsulation of ideas, attitudes, and beliefs (Van Marrewijk, 2017). Floricel and Brunet (2023, pp. 2) define symbolism as the *socially constructed aura of impressions, namely meanings, emotions and action propensities, accruing to megaprojects and to their representations besides direct assessments and communications of their functional, economic and social benefits*. This definition suggests that symbols have meanings beyond their inherent essence, but the meanings may be different for the various receivers. In this regard, Van Marrewijk (2017) distinguishes between "multivocality", i.e., the distinct interpretations of a complex representation, and the "exegetical meaning", i.e., the meaning derived from local interpretation. Highways, for instance, instil notions of modernity, which in some cases carry a sense of hope and optimism but in others are associated with the social and environmental costs of developmentalism.

Although every project carries particular emotions and meanings, the role played by symbolism is not the same in all megaprojects. Rego et al. (2017) argue that symbolism-intensive projects aim to deliver long-awaited needs enmeshed within a supreme mission. They make intensive use of rituals to convey to stakeholders and society the importance of the megaproject by framing it with paramount ideals of (post-)modernity, progress, or prestige. Consequently, the symbolism associated with megaprojects can be used strategically for the legitimisation of power, especially when struggles among stakeholders arise (Van Marrewijk, 2017).

Floricel and Brunet (2023) order megaprojects along two axes shaping their symbolism: expressing processes and impressing processes. Each of these axes also has two distinct possibilities. Expressing processes can be abstract, when they are mediated by language, ideas and significations; or concrete, when they are expressed directly through their shape, colour, texture and behaviour. Impressing processes can be cognitive when they require a reflexive, practical, calculated or reasoned attitude; or affective, when they are visceral, impulsive, attaching, and passionate. On the basis of these coordinates, the

authors differentiate among four types of megaproject symbolism: *narrative legitimating*, i.e. projects that transmit their symbolism through mediated, abstract expression (words, meanings) and require cognitive (reflexive) impressing; *tectonic embedding* if their expression is concrete and direct through their shape, colour, etc. but require cognitive impressing; *iconic agitation*, when their expression is abstract and mediated but they appeal to an affective, visceral and impulsive impressing; and *spectacular appeal*, if the expression of the megaproject is concrete and direct and they evoke an aura of emotions or attitudes directly.

Major communication infrastructures have played a leading role in the spatial development strategy in recent decades, and represent privileged materialisations of modern ideals. At least since Aschauer's (1989) seminal work, transport infrastructure has been claimed as an important determinant of productivity and economic growth. In a recent contribution for the World Bank, Foster et al. (2023) conducted a systematic qualitative review of the literature on infrastructure and development covering more than 300 studies between 1983 and 2022, and found several positive outcomes. For the particular case at hand, they found a positive impact of highways on trade, income, employment, migration and poverty reduction, although they also identified environmental conflicts associated with deforestation. Not everyone has been so complacent. From a systematic review of the empirical evidence, Deng (2013) found mixed results of transport infrastructure that can be attributed to contextual factors (e.g. research period, geographical scales, institutional settings), the characteristics of the phenomena and methodological reasons. Other authors have also pointed out that impact is conditioned by institutional factors. The local institutional environment affects the scale and type of infrastructure investments and, consequently, their returns. In settings with poor quality of government, investment may respond more to politicians' interests to finance visible large-scale highways that will enhance their re-election chances at the expense of more ordinary roads, even if their returns are lower than those of secondary roads (Crescenzi et al., 2016).

Irrespective of the particular impact on regional development, infrastructure projects are not just material forms that mediate exchange over distance, they are also semiotic carriers that convey impressions and ideals associated with connectivity. Infrastructures enact progress and freedom, which explains why they spark emotional attachment, particularly in developing societies (Larkin, 2013). One of the main ideals conveyed by communication infrastructures is that of modernity, even in the contemporary post-modern world. Highways bring different interpretations linked to modernity, such as the promise of speed and connectivity, the promise of political freedom as a way to overcome a history of colonial and post-colonial domination, and the promise of economic development (Harvey and Knox, 2015).

Communication infrastructures, particularly when it comes to flagship projects, are also drivers of a sense of national unity. Lured by monumentality, communication megaprojects are political symbols of a modernizing state that help it in the quest to build state legitimacy (Reboredo, 2019), particularly if states lack cohesive national identity or suffer from economic inequality, or both (Van Der Westhuizen, 2007). This does not mean, of course, that all citizens subscribe to these ideals - on the contrary, they are frequently strongly opposed, either by the communities affected by the social, material

and environmental displacements that they engender, or by indigenous peoples, whose livelihoods and values clash with the paramount values embodied by communication infrastructure. In what follows, we explore the role that two highway megaprojects have played in the conflict between the Chilean state and the Mapuche.

The Chilean state-Mapuche conflict

The Mapuche are the main ethnic group in Chile, representing around 10% of the total population and approximately 80% of the country's indigenous inhabitants. Their territory, called Wallmapu ('surrounding land'), covers an area on both sides of the Andes, in Chile the Ngulu Mapu (western land) and in Argentina the Puel Mapu (eastern land). They are made up of different ethnic groups depending on the territory they occupy, but they all share a culture, a language (Mapudungun), forms of social organisation and a cosmovision. In this, the worship of nature spirits and the interrelationship of the Mapuche people with the Earth are two important elements. Although many live in Santiago and other urban areas, the majority of rural inhabitants are located in the southern regions of Los Ríos, Los Lagos and especially Araucanía and Bío-Bío. They are one of the most disadvantaged populations in the country, with significantly worse economic, social and educational conditions.

The conflict between the state and the Mapuche has a long history dating back to at least 1861-1883, when the Republic of Chile carried out a series of campaigns that put an end to Mapuche independence. The conflict was revitalised from 1990 onwards with Chile's return to democracy. In 1998, the Coordinadora Arauco Malleco (CAM) was created, the main resistance group that uses violent and non-violent action to claim the return of Mapuche territories. Rojas Pedemonte and Miranda (2015) identify five cycles in the current stage of the conflict: the revitalisation of protest to demand rights, characterised by classic repertoires of territorial occupation (1990-1996); a period of radicalisation (1997-2000); the re-emergence of the electoral alternative among the moderate Mapuche organisations and the ‘active clandestinity’ of the more radical wing (2003-2006); heavy repression of the CAM and the emergence of a new guerrilla movement, the Alianza Territorial Mapuche (2007-2010); and a delegitimisation of political-institutional channels and an increase in radicalism (2011-2015), that still endures.

The dispute has its roots in demands for greater autonomy and self-determination, but has intensified in recent decades with the extractivism of the forestry industry, which the Mapuche movement associates with a new form of invasion of their ancestral territory. The Chilean forestry industry dates back to the end of the 19th century with the planting of the first foreign species (mainly *Pinus Radiata*) and was an industrial policy supported by governments of all kinds (Clapp, 1995). In 1974, a Decree Law by the military government defined a package of tax exemptions and subsidies that marked a turning point by favouring large companies and multiplying the planted area (Torres-Salinas et al., 2016). Subsequent governments have continued supporting the forestry industry as part of a national development strategy to make it one of the most competitive in the world (Manuschevich, 2016). We can situate current forestry within the recent wave of

(neo)extractivism in Latin America in which, unlike the conventional form led by transnational capital, the exploitation of natural resources serves an imagined national interest of sovereignty and economic diversification (Burchardt & Dietz, 2014). Nowadays, forestry makes up 6.8% of exports and is particularly important in the two regions where most rural Mapuche live, accounting for 13.8% and 10.8% of GDP in Bío-Bío and Araucanía, respectively (INFOR, 2023). The Mapuche have repeatedly denounced the collusion between timber businessmen and the state, and many attacks have been directed against forestry trucks and communication infrastructure (Hofflinger et al., 2021).

The Mapuche pursue their demands through non-conventional forms of political action (attacks, protests, land invasions, etc.), but they also engage in conventional electoral politics. Indigenous voters tend to participate more in municipal elections than in the presidential contest (Morales, 2021). Indeed, they are decisive in mayoral elections because there is a certain ethnic solidarity component in voting, that is, indigenous citizens tend to vote for indigenous candidates (Contreras and Morales, 2018). The scenario changes in the national dispute since there is no such ethnic component and the vote splits between the two coalitions of left and right that are contesting the presidency. The indigenous vote has traditionally been seen as having two distinctive features: a lower turnout given their disadvantaged socioeconomic conditions, and preferences for right-wing candidates since conservatives have historically performed well in regions with a strong Mapuche voter base. More recent studies question both assumptions. Although indigenous turnout rates are overall lower, in the southern territories where the Mapuche live the difference is not significant, and the vote has swung between left and right due to the political-electoral linkages that remain over time (Fuentes Saavedra et al., 2019).

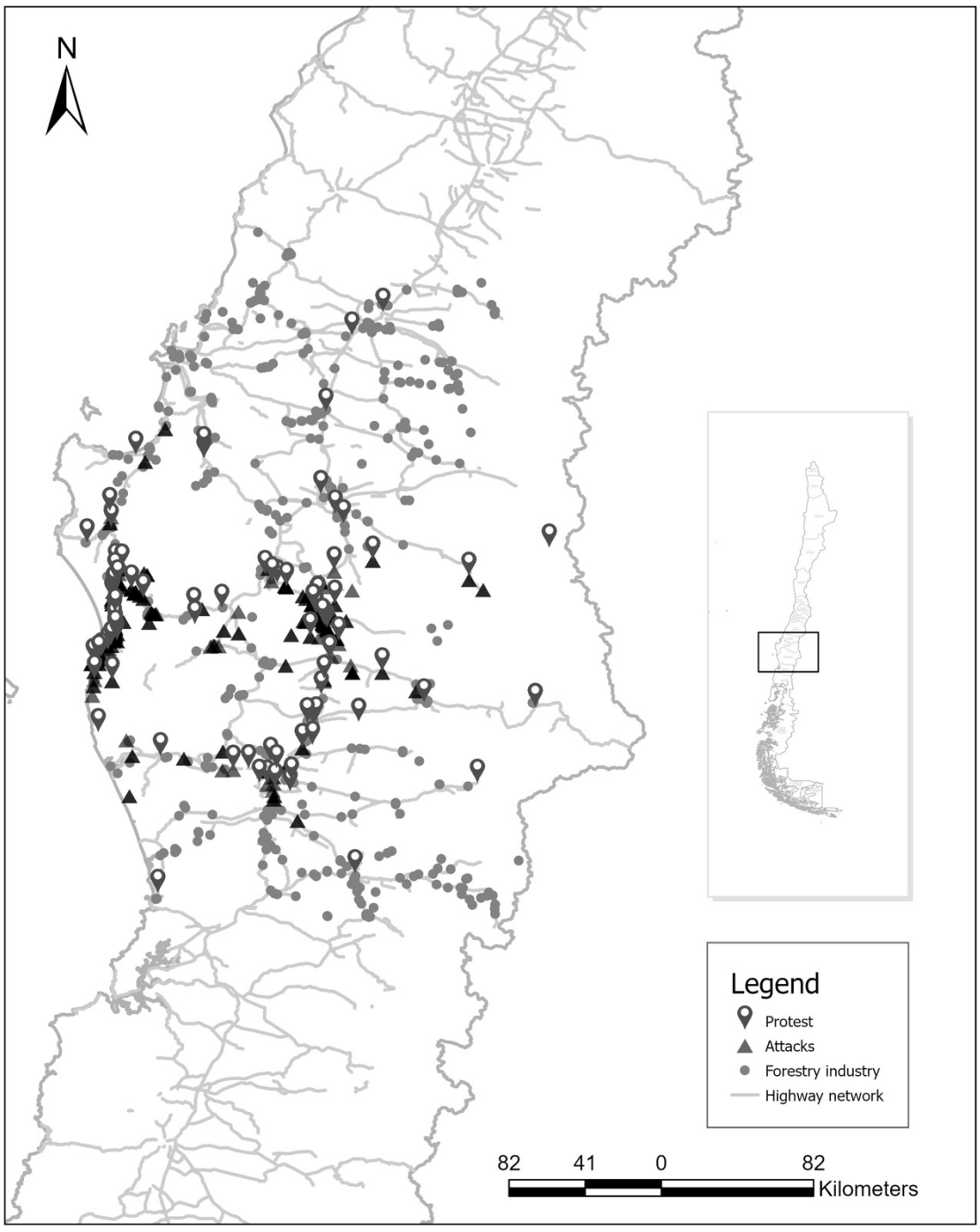
Data and methodology

In order to explore the electoral consequences of the opposition to infrastructure megaprojects, we analyse data on attacks and protests over road infrastructure. Data for this conflict comes from the Mapuche-Chilean State Conflict Events Database (MACEDA) (Cayul et al., 2022). MACEDA reports conflict events from the local media and classifies them into four categories: attacks (43.72% of events), protests (27.51%), state coercion (17.91%) and land invasions (10.86%) (Corvalan, 2022). In this paper, we focus on attacks and protests on road infrastructure (roads and bridges) for two reasons. First, because they are the most prevalent events. Secondly, because each represents a different tactic within the repertoire of actions. The literature has differentiated between violent and non-violent actions within non-conventional tactics (Cunningham et al., 2017; Cunningham, 2023). Protests include riot, demonstration, hunger strike, dry hunger strike, roadblock, block exit or entry, invasion of private or public property (other than land), and other protests, and they are predominantly non-violent. All attacks are violent.

Our study is confined to the two regions where most of the Mapuche people live and which account for more than 85% of the events, Araucanía and Bio-Bío. Figure 1 depicts the distribution of sawmills as a proxy for the forestry industry, attacks and protests on road infrastructure over the sample period. A total of 131 attacks and 78 protests are registered between 2013 and 2021, concentrated on two highways and their

communication roads: Route 5 (Pan-American Highway) on the east and the coastal Route 180 in the west (see Annex 1 for the data on conflict events). Figure 1 highlights the spatial variation the conflicts studied, which is central to the design and implementation of this research.

Figure 1. Distribution of the forestry industry, attacks and protests in conflict zones.



Source: own elaboration based on MACEDA and the Chilean Ministry of Public Works.

Alongside conflict events, we scrutinise three presidential election outcomes (2013, 2017 and 2021) to see whether attacks and protests reduce the probability of the ruling coalition repeating its victory. We take data from the lowest possible level, polling stations, in order to increase the number of observations and improve the reliability of the results. To ensure consistency, we select the polling stations that have kept their location constant over time (see Annex 2 for electoral data).

In Chile, the president is the head of the state and head of government and holds important policy-making prerogatives over the legislative branch. Presidential elections are held every four years following a proportional electoral rule in a two-round system, i.e., the winning candidate must obtain the absolute majority in the first round or the simple majority in the second round. In our exercise, we use the data from the second round. Even if there are several political parties, electoral competition has revolved around coalitions structured along left/right axes. In the three elections of the sample, the left and the right have alternated in power: in 2013, the centre-left *Nueva Mayoría* (*New Majority*) coalition won for Bachelet, while in 2017 the right-wing *Chile Vamos* (*Let's go Chile*) coalition gave victory to Piñera. The protests of 2019/2020 brought a new contender who benefitted from social discontent, and led Boric's left-wing *Apruebo Dignidad* (*Approve Dignity*) coalition to victory in 2021. Several factors characterise the dynamic of electoral competition during our sample period. First, the vote remained relatively stable with regard to ideological and programmatic coordinates. The contenders differed in their programmatic proposals, and compared to other Latin American countries, the vote rested to a higher degree on these policy alternatives rather than on clientelistic incentives. Last, coalitions remained stable over time without party shifts across blocs, a recurrent phenomenon in the region.

To explore how the attacks and protests over road infrastructure affect presidential election results, we make use of a Regression Discontinuity Design (RDD). RDD is a quasi-experimental design characterised by a dichotomous treatment assigned from a function of a continuous, observable covariate (Cattaneo et al., 2020). Since the pioneering work of Lee (2008), this methodology has been widely used to test whether incumbent candidates enjoy any kind of advantage from being in office. One of the main challenges to address when analysing incumbency advantage is the selection bias, given that a candidate's incumbency status is not determined randomly, but depends on several factors, such as the quality of the politician, her party affiliation and the dynamics of the opposition. RDD is particularly useful for addressing the problem of selection bias. Exploiting the discontinuity inherent in the simple majority voting system, Lee (2008) shows that in highly competitive elections where the margin of victory is close to zero, the results resemble a randomised experiment in which the probability of re-election is virtually random. Therefore, by placing the focus on the most competitive settings, this method isolates potential confounding factors and allows us to assess the effect of the conflict on the governing coalition’s probability of winning.

The analysis works with geo-referenced information on polling stations, attacks and protests, so we can identify changes in preferences in the most competitive places where there is the highest degree of uncertainty, and follow these places over time. The

dependent variable is the probability that the ruling coalition repeats its victory in polling stations close to conflict events, the treatment group consists of those candidates who won by a narrow margin at t_{+0}, and the control group those who lost by a narrow margin at t_{+0}. For the treatment group we calculate the difference from the closest challenger, while for the control group we consider the difference with respect to the winner. In this way, all winning candidates have a positive vote margin, and losers a negative vote margin, so the single cut-off point is the 0 margin and, therefore, the treatment assignment is perfect. The analysis compares the same governing coalition that was elected at booths where it barely won with booths where it barely lost, which allows us to address the recent criticisms the RDD has faced regarding the election of the challenger as the best point of comparison for the incumbent (Marshall, 2022). We make use of a sharp RDD because the running variable is continuous and univariate, there is a single cut-off point that determines treatment assignment and treatment compliance is complete, i.e. all units above the cut-off point receive treatment and no units below it receive treatment.

Consider $A_{m,t}$ as the margin of victory or defeat for a candidate at polling station m at time t. The treatment variable T_m $[T_m = 1, ssi\ A_{m,t} > 0\ ]$ is a dummy indicating when the candidate won the election at polling station m at time t. The dependent variable is a dummy ($T_{m,t+1}$) which takes the value 1 when the candidate wins in the next election. We have $Y_{m,t+1}\ (1)$ and $Y_{m,t+1}\ (0)$ as the potential outcome when $T_{m,t} = 1$ and $T_{m,t} = 0$, respectively. The effect of winning on the probability of winning the next contest is:

$$\tau_T \equiv E\left[Y_{m,t+1}\ (1) - Y_{m,t+1}\ (0) \mid A_{m,t} = 0\right]$$
$$= \lim_{x \downarrow 0} E[Y_{m,t+1}\ (1) \mid A_{m,t} = x\ ] - \lim_{x \uparrow 0} E[Y_{m,t+1}\ (0) \mid A_{m,t} = x]. \qquad [1]$$

We perform the RDD for two groups, one for polling stations near conflict events and another for distant units. A distance equal to or less than 5 km differentiates close and distant booths. We take a 5-km threshold because RDD needs a large number of observations to estimate the local average treatment effect and at shorter distances, the number of observations is very low. We could not include the 5-km boundary as a second condition for treatment allocation because RDDs require a discontinuous change in the probability of receiving the treatment status at the cut-off, and nothing changes discontinuously over this distance, as would be the case if it were a border or an administrative boundary. Therefore, we cannot identify causal effects of distance from conflict events on the likelihood of re-election, but we can observe differing patterns in areas near and far from the events.

To conduct the estimates, we use a triangular kernel weighting to determine the optimal bandwidth, following Imbens and Kalyanaraman (2011) and further developed by Calonico et al. (2014). This approach allows us to achieve the best prediction right at the cut-off point. We calculate the optimal bandwidth and the different intersection points using the Stata package 'rdms'. This package applies robust standard errors to address heteroscedasticity and a bias correction.

Results

Table 1 presents the results of the effect of attacks and protests over road infrastructure on the incumbent coalition's probability of victory in zones close to and far from the events. We made different calculations for a distance between conflict events and polling stations in a range between 4.8 km and 5.2 km for close booths, and for several distances starting from 5 km for distant booths, since the effects may vary along the frontier (Keele and Titiunik, 2015). The results in Table 1 show that in a distance range of 4.8 to 5.2 km between attacks and polling stations, the probability of re-election of the governing coalition in competitive polling stations is negative compared to the control group, ranging from -25% to -22%, depending on the distance. In contrast, for protests no statistically significant effect is identified. When we turn our attention to distant places, the coefficients are positive for both, attacks and protests, but neither is statistically significant. These estimates show a clearly differentiated electoral pattern in areas near and far from the insurgent actions: attacks on the Pan-American and Route 180 highways significantly damage electoral prospects at nearby polling stations, while there are no significant effects for protests; for more remote areas there is no effect for either of these forms of non-conventional politics.

Table 1. The probability of victory for the governing coalition in polling stations close to and far away from conflict events.

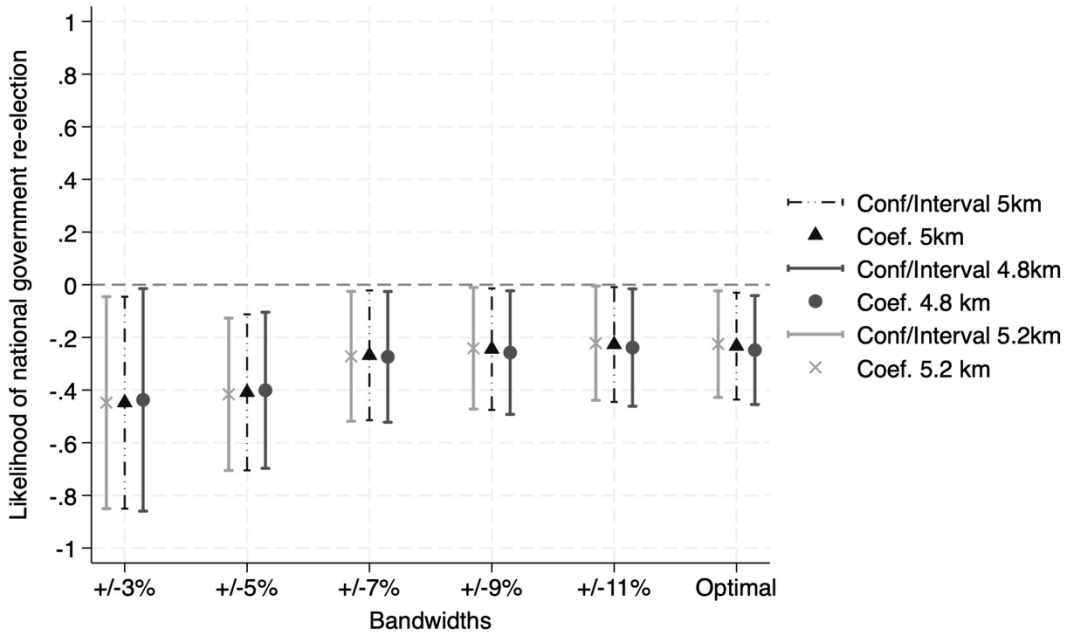
Distance	**Attacks**				**Protest**			
Km	**Coeff. (1)**	**P>|z| (2)**	**Obs (3)**	**N. Bw (4)**	**Coeff. (1)**	**P>|z| (2)**	**Obs (3)**	**N. Bw (4)**
< 4.8	-0.248**	0.049	990	229	-0.106	0.194	1,548	486
< 5.0	-0.232*	0.059	1,050	241	-0.106	0.194	1,548	486
< 5.2	-0.225*	0.067	1,073	244	-0.107	0.192	1,581	480
Distance	**Attacks**				**Protest**			
Km	**Coeff. (1)**	**P>|z| (2)**	**Obs (3)**	**N. Bw (4)**	**Coeff. (1)**	**P>|z| (2)**	**Obs (3)**	**N. Bw (4)**
> 5.0	0.058	0.267	9,368	1,181	0.062	0.294	8,870	1,501
> 5.5	0.060	0.270	9,214	1,744	0.068	0.252	8,725	1,478
> 6.0	0.045	0.329	9,088	1,700	0.061	0.288	8,503	1,557
> 6.5	0.048	0.296	8,967	1,699	0.055	0.340	8,352	1,567
> 7.0	0.048	0.304	8,812	1,688	0.061	0.297	8,209	1,515
> 7.5	0.046	0.380	8,678	1,820	0.070	0.252	8,079	1,462

Note: (1) ***p<0.01; **p<0.05; *p<0.1 (2) p-value (3) Number of observations (4) number of observations on the bandwidth

The benchmark estimates in Table 1 correspond to an optimal bandwidth, which in this case is a margin of victory of ±13%. However, in electoral terms the optimal bandwidth may not necessarily reflect contested elections. Therefore, to check the robustness of benchmark results, Figure 2 shows estimations for other bandwidths, ranging from ±11% to ±3%. For bandwidths below ± 3%, the observations fall below the minimum required.

The robustness exercise confirms that localities near an attack on critical infrastructure punish the national government electorally, reducing the chances of the coalition government by a range of 22% to 44%, depending on the bandwidth considered.

Figure 2. Probability of winning at attack-affected competitive polling stations for different bandwidths and distances.



Source: own elaboration

It could be the case that our results are due to the fact that the ruling coalition enjoys some kind of incumbency disadvantage, and therefore our calculations do not necessarily reflect the effect of attacks, but rather those derived from being in office. To test this claim, we performed a robustness test with all polling stations in Araucanía and Bío-Bío during the sample period. Our goal was to see if incumbent candidates are more likely to win (or lose) than their opponents. The results are displayed in Annex 3. According to our calculations, voters neither reward nor punish the national cabinet for its performance, as none of the coefficients are statistically significant. This robustness exercise confirms that being in government neither gives an advantage nor a disadvantage in the next contest.

Why do Mapuches concentrate their attacks on these two roads? Route 5 is Chile's main road and part of the emblematic Pan-American Highway that crosses the Americas from North to South. It is a key connectivity hub in the country, particularly important for the forestry industry in connecting extraction areas to the market and export infrastructure. But the activity of the forestry industry degrades soils by planting other species, and is responsible for water scarcity and its contamination by the use of agrochemicals (Torres-Salinas et al., 2016), and it has not served to improve the socio-economic conditions of the Mapuche (Hofflinger et al., 2021). Symbolically, Route 5 materialises an ideal of

national integration based on notions of modernity that affirm the economic and political power of the country's centre (Urrutia, 2023). This narrative of modernity and national unity is evident throughout the route, from the posters appealing for unity that are scattered along the way, to the more abstract symbolism associated with the far south. As Urrutia (2023) highlights, *signs reading "Works that unite Chileans" are common at the edge of this road (….) They appear as reminders that, according to the state, the connectivity allowed by projects like this highway is analogous to "uniting Chileans." In other words, for the state, Route 5 is a symbol of national unity*.

Route 180 is also a key infrastructure for southern connectivity that links the two Mapuche regions of Araucanía and Bío-Bío. Due to traffic congestion, it is being remodelled in the section that constitutes our study area in order to connect major productive and urban centres in the Bío-Bío and Araucanía regions and *project Chile as a more inclusive and developed country* (http://www.rutanahuelbuta.cl/). Following Floricel and Brunet (2023), we can synthesise the symbolism associated with these two infrastructure megaprojects as *narrative legitimating* since they rely on abstract expressing (labels, sense-giving, rhetoric, storytelling) and cognitive impressing processes instilling the belief that, in addition to its direct functions and benefits, they convey broader values (e.g. modernity) and goals (e.g. unite Chileans).

The economic rationale and the symbolism of unity clashes with the Mapuche understanding of territory and their demands for greater autonomy. According to their cosmovision, land ("Mapu") acquires a connotation of intangible material and immaterial good (Ranjan et al., 2021). As is the case with other indigenous peoples in the Americas, the territory is not merely an economic resource, but is part of an identity in which the culture and the traditions are strongly rooted in their land. The literature on conflict studies has highlighted that self-determination groups rely on non-conventional tactics when they value their land for symbolic reasons. The importance of territory is due to essential and instrumental concerns (Kelle, 2021): essentially, their demands are inherently territorial; instrumentally, territory provides groups with mobilisation advantages stemming from its relevance for the development of a robust and cohesive group identity. Thus, by focusing attacks and protests on these two key infrastructures, they are not only damaging electoral prospects, but they are also contesting the symbolic sphere over the territory.

Another important insight that emerges from our results is in relation to the effectiveness of the strategy. On a general level, a discussion arises about the use of non-conventional means, both violent and non-violent, or the use of electoral politics by SD groups. Non-conventional tactics and electoral politics may be strategic substitutes, in that political actors may optimally choose to submit to the ballot box or instead attempt to impose their will by force; or they may be strategic complements, in that actors use violence to bolster their electoral aims, or use electoral returns as sources of information on underlying preferences that they exploit in armed campaigns (Dunning, 2011). Our analysis suggests that they are strategic complements, but of a different nature: the Mapuche use the attacks on road infrastructure as a means of making their demands visible, while damaging the electoral chances of incumbent candidates.

On a more specific level, our analysis provides insights into the effectiveness of the different non-conventional tactics employed. Cunningham (2023) argues that small scale non-violence, such as protests, can be effective for SD movements to obtain concessions. The reason is that this allows them to frame their claims as human rights issues, rather than as rights to national self-determination. Indeed, she shows that, although violence is effective in forcing the state to meet their demands, non-violent tactics are more effective. Our estimates suggest a different interpretation. Attacks on these two highways are effective in damaging presidential candidates' expectations, who see their chances of re-election reduced in the most competitive settings. In contrast, protests do not have a significant effect. Therefore, although we are not looking at the concessions won, our calculations point to the effectiveness of violent as opposed to non-violent actions.

Why are attacks effective in damaging the electoral chances of presidential candidates, while protests have no statistically significant effect? In order to make progress on the mechanism that explains this result, it seems appropriate to look at the dynamics of voter turnout. Our argument is that attacks on infrastructure reduce turnout because citizens do not mobilise in attack-affected areas out of fear, demotivation, because they no longer believe in democracy, or for some other subjective reason. Conversely, in areas affected by protests, there is likely to be a higher turnout, because voting is a means of protesting and expressing discontent. To test this assumption, we compare the average turnout at polling stations with and without conflict events. The objective is to identify changes in voter turnout in different periods according to the type of conflict (protest vs. attack).

Table 2. Percentage difference in turnout between affected and unaffected polling stations, periods t_{+1} - t_{+0}

	Attacks					
km	Mean T=0	Mean T=1	Diff.	p-value diff=0	No. T=0	No. T=1
4.8	16.098	8.768	7.330	0.000	9428	990
5	15.964	10.383	5.580	0.000	9368	1050
5.2	15.984	10.332	5.651	0.000	9345	1073
Protests						
km	Mean T=0	Mean T=1	Diff.	p-value diff=0	No. T=0	No. T=1
4.8	14.436	20.939	-6.503	0.000	8870	1548
5	14.436	20.939	-6.503	0.000	8870	1548
5.2	14.443	20.761	-6.317	0.000	8837	1581

Table 2 shows the percentage differences in turnout between affected (T=1) and unaffected (T=0) polling stations for periods t_{+0} and t_{+1} across different distances. The results show that voter turnout varies according to the type of conflict event: in attack-affected polling stations, voter turnout is substantially lower with respect to the untreated group; on the other hand, in protest areas voter turnout is much higher with respect to

untreated areas. In both exercises, the differences in means between affected and non-affected polling stations are statistically significant for all estimated distances. These results allow us to infer that there is a relationship between the non-conventional tactics employed and electoral participation: in polling stations close to attacks, turnout is lower and the incumbent coalition's chances of retaining her victory drop significantly, probably due to the dissatisfaction associated with violent tactics. Conversely, in areas close to non-violent protests, turnout rises as another way of channelling this protest, but the electoral chances of the ruling coalition remain unaffected.

Conclusions

Megaprojects are drivers of local and regional development because of their capacity to transform space and societies. Their power goes beyond the specific intentions for which they are built as they become symbolic artefacts that evoke impressions and project imaginaries. Few ventures represent this duality as well as major communication infrastructures. Highways have played a leading role in regional development, connecting areas and boosting economic activity while unfolding a narrative of modernity and national unity to which many citizens subscribe. Aware of their electoral magnetism, politicians build new highways to boost their electoral prospects, indeed, few things please a politician more than cutting the ribbon to inaugurate a new project. However, sometimes this backfires.

This article has addressed the electoral impact of Mapuche attacks and protests against two emblematic road infrastructures for southern connectivity, the Pan-American Highway and the coastal route. The Mapuche are in conflict with the Chilean state in a quest for self-determination, and focus their actions on flagship projects as a way of making their demands heard. Using a RDD, this piece of work has been able to compare the effects of attacks and protests in competitive booths close to and far away from these events. Attacks on road infrastructure reduce incumbent candidates' probability of victory at nearby polling stations whereas protests do not have a significant effect. In contrast, at distant polling stations, neither attacks nor protests have a significant effect on the governing coalition's chances of repeating victory.

This paper, therefore, shows another side of the *political sublime* of megaprojects: rather than favouring the electoral perspectives of those in power, they become a locus of struggle to contest their symbolism. The Mapuche attacks seek to draw attention to their issues and to challenge the narrative of national unity and modernity that these two routes represent. Our work identifies voter turnout as the reason why attacks have an effect on the likelihood of re-election, while protests do not. In attack-affected polling stations, electoral participation is significantly lower compared to non-affected ones, whereas in protest-affected polling stations turnout is higher. We associate this trend with the demobilisation generated by the attacks due to fear or demotivation, while in protest-affected areas, voting is another way of expressing discontent.

In this exercise, we have faced a number of constraints. While RDD is robust in terms of internal validity, its results are context-specific. It would be interesting, therefore, to analyse the electoral effects of opposition to megaprojects in other settings to test under what circumstances they can be a burden for incumbent candidates. On the other hand, this paper has focused on the political costs of attacks on megaprojects, but there are also significant social and economic costs that we have not been able to explore.

In spite of these limitations, we believe our work presents several contributions to the literature and opens up new avenues of enquiry that deserve to be explored. First, we have been able to measure the electoral impact of opposition to megaprojects, something rather unusual despite the fact that it is well known that megaprojects are usually strongly opposed by at least a part of the population. Moreover, they represent an ideal scenario for the use of quasi-experimental public policy evaluation techniques such as RDD or Difference-in-Difference (DiD), insofar as we have a treatment group composed of those affected by the megaproject, and others not affected. Here we have taken an extreme case of opposition leading to attacks and protests, but the latter are not so infrequent and this study can serve as inspiration for further research. Second, our work also contributes to peace and conflict studies by addressing the role that attacks and protests over megaprojects have for insurgent movements seeking self-determination. Insurgent groups carry out actions on strategic infrastructures because of their visibility and because they allow them to contest certain narratives. It is therefore worthwhile to understand the symbolism associated with these facilities, both for governments and rebel organisations, as they struggle in the material and the discursive realm.

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Annex 1. Characteristics of conflict events at road infrastructure in Bío-Bio and Araucanía regions between 2013 and 2021.

	ATTACK	**PROTEST**
LOCATION		
Bridge	10	3
Highway	121	75
PERIOD		
2013-2017	35	23
2017-2021	96	55
REGION		
Bío-Bío	56	36
Araucanía	75	42
Total	**131**	**78**

Annex 2. Electoral data

	Period 2013-2017		Period 2017-2021		Total Periods	
	<=5 km	>5 km	<=5 km	>5 km	<=5 km	>5 km
Polling stations	441	6119	609	3249	1050	9368
Bío-Bio	11.56%	72.38%	25.29%	71.07%	19.52%	71.93%
Araucanía	88.44%	27.62%	74.71%	28.93%	80.48%	28.07%
Votes by polling stations						
Median	142	149	166	167	158	155
Average	135.62	143.50	165.18	167.60	152.78	151.86
Std. Dev.	43.06	35.97	29.96	38.15	38.87	38.49
Min	24.00	20.00	62.00	29.00	24.00	20.00
Max	277.00	408.00	298.00	484.00	298.00	484.00
Electoral outcomes in period t						
Polling stations where incumbent coalition won	75.96%	88.58%	96.06%	87.63%	87.62%	88.25%
Polling stations where incumbent coalition lost	24.04%	11.42%	3.94%	12.37%	12.38%	11.75%
Electoral outcomes in period t+1						
Polling stations where incumbent coalition won	4.76%	11.70%	8.37%	75.44%	55.14%	33.81%
Polling stations where incumbent coalition lost	95.24%	88.30%	91.63%	24.56%	44.86%	66.19%

Annex 3. RDD estimations for incumbency advantage in Bío-Bío and Araucanía regions

	Bandwidth					
	Optimal	+/-8%	+/-6%	+/-4%	+/-2%	+/-1%
	(1)	(2)	(3)	(4)	(5)	(6)
Prob. winning t+1	0.033	-0.035	-0.063	-0.038	-0.246	0.938
	(0.496)	(0.631)	(0.473)	(0.762)	(0.408)	(0.375)
Observations	10,418	10,418	10,418	10,418	10,418	10,418
Observations right (barely winners)	686	566	470	338	158	63
Observations left (barely losers)	1,365	983	703	445	227	132

Note: The running variable is the margin of victory at *t* and the outcome variable is probability of winning at *t+1*. Robust standard errors, clustered by municipality, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.