EUI DEPARTMENT OF ECONOMICS

Essays in Empirical Political Economy

Tuuli Tähtinen

Thesis submitted for assessment with a view to
obtaining the degree of Doctor of Economics
of the European University Institute

Florence, 26 May 2023

European University Institute
Department of Economics

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Abstract

This thesis consists of three independent essays in empirical political economy. In the first chapter I study how populist representation affects other parties' ideological positions. I use variation created by close elections to identify ideological shifts resulting from a change in party representation, holding voter preferences constant. I use candidate level survey data from a voting advice application, and I model candidates' responses using item response theory to obtain measures of political ideology. I show that higher populist representation causes mainstream parties to become more ideologically aligned with the populist party. The results demonstrate that increased populist representation can spread populist ideologies.

In the second chapter I investigate whether social media affects occurrence of conflict. I focus on the ongoing Myanmar conflict because in such context internet is mainly accessed via mobile phones and the Facebook app in particular. I take advantage of a shock in Facebook availability and use local variation in cell phone coverage as an exogenous determinant of social media availability. I find that social media availability decreases conflict, especially organised violence involving rebel groups. The analysis also reveals significant heterogeneity, suggesting that inflammatory content on social media may escalate conflict in areas with deep ethnic cleavages.

In the third chapter, jointly with Nikolaj Broberg and Thomas Walsh, we investigate how political alignment affects implementation of punitive welfare measures in the UK. We use a regression discontinuity design based on close elections to compare the rate of sanctions to unemployment benefits across constituencies that are aligned or unaligned with the government. We find that implementation of the sanction regime is significantly more lenient in constituencies won by the government parties. Our findings suggest pork barrel politics can also influence the allocation of economic "bads", even within a highly centralised system, and can undermine institutions which should be neutral to local partisan considerations.

Acknowledgements

This thesis would not have been possible without the support of many people. First, I would like to express my deepest gratitude to my supervisors Andrea Mattozzi and Thomas Crossley for their support and guidance throughout my Ph.D. Besides providing invaluable feedback and encouragement, I am especially grateful for the great belief in my ideas and abilities, and being available both during the pandemic and when I was away from Florence. I always felt motivated after our meetings. I am also indebted to Arthur Schram, who provided guidance during the early stages of the thesis.

Moreover, I am indebted to Enrico Cantoni for providing thoughtful feedback on my research, as well as for his help and encouragement during the job market. My gratitude also goes to Roope Uusitalo for agreeing to be part of my thesis committee and for reviewing my work and making valuable suggestions. I thank Academy of Finland for funding that enabled me to study at the EUI. Part of this dissertation was written during my stay at Aalto University. I gratefully acknowledge the hospitality of the economics department and thank all the people who took time for my presentations and offered me feedback.

The years in Florence would not have been nearly as enjoyable without the wonderful friends and colleagues. I am extremely grateful to my co-authors Thomas Walsh and Nikolaj Broberg for their collaboration. A special mention goes to Natalie, Nicole, Zoey, Johannes, Oliver, and Thomas, who have been there for the long hours at Villa la Fonte, the many discussions and commiserations, dinners, movie nights, hiking and bouldering trips. You made this journey infinitely better.

Finally, I want to thank my family, especially my partner Eero, who has supported me from the beginning. And Elias, who came into our life at end of the Ph.D., and who puts everything into perspective.

Contents

Preface

This thesis consists of three independent essays in empirical political economy. The chapters use applied microeconometric techniques with data from both developed and developing countries to examine the impacts of populism and political representation more generally, and to investigate political conflict.

The first chapter studies populism. Populist parties have gained significant power in European politics in the last decades, raising concerns over the potentially contagious effect of populism. Despite the rise of populism, it is unclear how traditional parties react to the populists success and how it affects the political space. I investigate how populist party representation affects other parties' ideological positions. I use variation created by close elections to identify ideological shifts resulting from a change in party representation, holding voter preferences constant. I study a context of proportional elections in which candidates face multiple competitive margins and electoral closeness is not easily defined. I determine candidates' electoral closeness by using a bootstrap approach to simulate elections, and I then instrument the populist seat share with the share of closely elected populist party candidates. I use novel survey data on candidates' political preferences, and I model candidates' responses using item response theory. The findings that shed light on how the emergence of populist parties shape the political spectrum and competition between parties. The main result is that increased populist representation causes mainstream parties' ideological positions to convergence towards the populist party's position, holding voter preferences constant. Therefore, the results show that populist representation can amplify the populist shift of the political space.

The second chapter investigates whether social media affects probability of conflict events. This paper uses a novel approach to identify the impact of social media. I focus on the context of ethnic conflict in Myanmar. In this setting, Facebook has been used to spread misinformation and hate speech against ethnic minorities, and internet is mainly accessed

via Facebook which allows distinguishing social media from the broader internet. Since internet is mainly accessed via mobile phones, I use local variation in cell phone coverage as an exogenous determinant of internet access, and I take advantage of a temporary shock in Facebook availability. The results indicate that on the whole, social media availability reduced the occurrence of conflict. However, the analysis reveals important regional variation. When focusing on the region which is home to the Rohingya people, a severely marginalised minority, the results suggest that Facebook availability led to a small increase in probability of conflict. The results suggest that inflammatory content on social media may escalate conflict in areas where ethnic tensions are particularly high.

In the third and final chapter, jointly with Nikolaj Broberg and Thomas Walsh, we investigate how political alignment affects the implementation of punitive welfare measures in the UK. In particular, we examine whether a legislator's party affiliation affects the rate of sanctions to unemployment benefits in the MP's constituency. To address the endogeneity of which party wins in a constituency and area characteristics, we use a regression discontinuity design based on close elections to compare the rate of sanctions to unemployment benefits across constituencies that are marginally aligned or unaligned with the central government. We find that implementation of the sanction regime is significantly more lenient in constituencies won by the government parties. Our findings suggest pork barrel politics can also influence the allocation of economic "bads", even within a highly centralised system, and can undermine institutions which should be neutral to local partisan considerations.

Chapter 1

Populism and Ideological Convergence: Evidence from a Multiparty System

Abstract Populist parties have gained significant power in European politics in the last decades, raising concerns over the potentially contagious effect of populism. I study how populist party representation in local councils affects other parties' ideological positions. I use variation created by close elections to identify ideological shifts resulting from a change in party representation, holding voter preferences constant. I use candidate level data from a voting advice application to derive ideological positions. I model candidates' responses using item response theory to obtain measures of ideology that are comparable across election years. I show that higher populist representation causes mainstream parties to become more ideologically aligned with the populist party. The results demonstrate that increased populist representation can spread populist ideologies.

1.1. Introduction

Populist parties and ideologies have become increasingly mainstream in European politics. Populists have become significant forces in the opposition, such as AfD in Germany and National Rally in France, and as governing parties, for instance Swiss People's Party in

Switzerland, FPÖ in Austria, Lega in Italy and Finns Party in Finland. Recent literature shows that populist governments are bad for economic performance and can erode democratic institutions, such as checks and balances on the executive, independent judiciary and press freedom (Funke et al., 2020). Populist politicians' electoral success has raised concerns about contagion of populism across parties, and even of democratic backsliding. One way populism could spread is the impact of populist representation on mainstream parties. However, it is not clear whether the presence of a populist party can directly impact the political space, or whether mainstream parties merely respond to voter preferences. This paper provides causal evidence of the effects of populist representation and contributes to a better understanding of party competition and policy convergence in a multiparty setting.

In this paper I study how populist party representation affects mainstream parties' ideological positions. To estimate the causal effect of populist representation, I use an instrumental variable approach that takes advantage of close contests in Finnish local elections. I show that increased populist representation leads to convergence towards the populist position, particularly on the liberal-conservative policy dimension. This dimension describes views on social and cultural issues, and it is the primary policy dimension of the populist party. One standard deviation increase in populist seat share (approximately two seats), leads to about 0.1 s.d., or 4 %, reduction in average distance between mainstream parties and the populist party.

Finland provides a good case study to explore the impact of populism on the supply of political ideologies for the three following reasons. First, Finland has experienced a strong wave of populism. During the past decade, the Finns Party—the populist party in Finland—has transformed from a fringe party to one of the most popular parties. Its parliamentary vote share increased from 4 % in 2007 to 19 % in 2011, and it was part of the coalition government in 2015–2017. Second, local elections are important due to the significant economic role of municipalities: they are responsible for social and health care services, they are a major employer, they collect income and property taxes and have a high

degree of fiscal autonomy. Finally, I can study several elections in comparable polities within the same institutional context.

Previous the literature on populism shows that adverse economic conditions can drive decreasing trust in politics, anti-immigration attitudes and voting for populist parties, and that mainstream parties also respond to these changes in voter preferences (see e.g. Guiso et al., 2017; Guriev & Papaioannou, 2020; Schumacher & Van Kersbergen, 2016; Wagner & Meyer, 2017). In general, the literature on why and when parties adjust their positions has focused on how responsive parties and candidates are to changes in public opinion (e.g., Abou-Chadi & Stoetzer, 2020; Adams et al., 2004; Ansolabehere et al., 2001). In contrast, I provide evidence for a supply-side effect. By distinguishing representation from voter preferences, I provide causal estimates of how the presence of a populist party affects mainstream parties' behaviour.

Even though gaining more seats in close elections reveals very little about voter preferences, mainstream parties can react to populist presence either because their candidates' preferences change, or because of strategic considerations. These two mechanisms need not be mutually exclusive. First, being more exposed to the populist party's agenda and having more interaction with the populist candidates could influence individual candidates' preferences. Second, gaining more seats can make the party seem like a more viable contender. Having more politicians in office provides more experience, resources, media attention and legislative presence, which can make the party more electorally threatening even without a change in voter preferences. Furthermore, mainstream parties may react because of a perceived or expected change in voter preferences. The seats gained in close elections could be attributed to shifts in voter preferences, or mainstream parties can anticipate that having more elected politicians can increase the popularity of that party's agenda and change voter preferences.

To what extent the impact on mainstream parties' positions is due to a strategic response or changes in individual politicians' preferences, cannot be answered definitively. In

either case, the implication is that populist representation may influence policy also indirectly by inducing mainstream parties to change their policy positions. Furthermore, a supply-side effect in which political candidates adopt more populist positions may increase voter demand for populism by increasing the salience of social and cultural issues (Rodrik, 2020), which can then further amplify the spread of populism.

To estimate parties' ideological positions, I use candidate level survey data from a voting advice application (VAA). The survey consists of a list of statements on policy and ideological views, and it therefore provides comprehensive information on candidates' political preferences. The data is collected before the election and also includes candidates who were not elected. Because the purpose of the voting advice application is to provide information for voters, the candidates' answers are made public prior to the election. Voters can fill in the same questionnaire, and the VAA shows which candidates are most aligned with the voters' views. Using individual candidates' preferences to derive party positions allows me to take advantage of both cross-sectional and time variation in ideological positions.

I employ an Item Response Theory (IRT) model to estimate candidates' ideologies. IRT methodology is commonly used in educational assessment and in psychometrics to measure latent traits, such as ability or attitudes, but it has been underutilised in economics. The advantage of IRT is that it distinguishes the respondent's level of latent trait—in my case the political ideology—from properties of the survey items (e.g., item difficulty). The probability of a particular response to a survey question is modelled as a function of the respondent's level of latent trait and item parameters (Kolen & Brennan, 2004). This approach allows me to measure the respondents' ideological traits from several waves of data, producing measures that are on the same scale, and therefore comparable between election years.

I examine how an exogenous increase in populist party representation—due to randomness of close elections—influences ideological distances between the populist party and other parties in the same municipality. Because Finland has open-list proportional representation, it is not possible to employ regression discontinuity design. As each candidate's

election outcome depends on their vote rank within the party, the party's votes, and votes of all other parties, there are no predetermined seat thresholds. To identify electoral closeness, I follow a bootstrap approach by Kotakorpi et al. (2017). I simulate elections by resampling votes from the empirical vote distribution and determine electoral closeness based on how often a candidate is elected in the simulations. Candidates whose election status changes often in the simulations are considered to be close to the election threshold. I then instrument the populist seat share with the share of closely elected populist party candidates (see Clots-Figueras (2011) and Hyytinen et al. (2018) for a similar approach).

My main finding is that increased populist representation causes mainstream parties' ideological positions to converge towards the populist party's position. Because the effect is due to random election outcomes, it does not reflect a change in voter preferences. In other words, mainstream parties respond more to the electoral performance of the populist party than known level of voter demand would suggest. On average, a one standard deviation increase in populist seat share (due to closely elected candidates) leads to a 0.1 standard deviation decrease in the average distance between mainstream parties and the populist party.

Ideological convergence takes place primarily on the liberal-conservative policy dimension, which describes social and cultural values (for example views on immigration and environmental policies), and it can be observed for parties across the political spectrum. The finding demonstrates that populist representation can amplify the populist shift of the political space. Instead, there are no significant effects on the economic policy dimension. Mainstream parties may adjust their position on social and cultural issues to target voters who are conflicted between their economic and social preferences. I show suggestive evidence that convergence is to some degree simultaneous—mainstream parties become more conservative, and the populist party becomes slightly more moderate. Only the green party, whose platform strongly emphasises socially liberal issues, clearly increases its ideological distance to the populist party.

The results are consistent with the interpretation that in order to compete against the electoral threat of the populist party, mainstream parties shift closer to the populist platform. This adjustment takes place primarily on the dimension which is more emphasised by the populist party. Moreover, parties may be willing to adjust their positions on their secondary areas even when the prior distance is long. However, when the prior distance is long and the dimension is a primary policy area for the party, incentive for convergence is low. This is reflected in the different reactions of the two socially liberal parties—the left-wing party which converges, and the green party which moves away from the populist party. The left-wing party is first and foremost concerned with economic issues, whereas the green party prioritises liberal issues.

This paper contributes to several strands of literature. First, it speaks particularly to the effects of populism (for a comprehensive review see Guriev & Papaioannou, 2020). Previous literature has focused on the drivers of populism, showing that adverse economic conditions have contributed to changes in voter preferences and the initial rise of the populist parties (Algan et al., 2017; Colantone & Stanig, 2018; Fetzer, 2019). Populist governments have been linked with rising protectionism and slower economic growth (Fajgelbaum et al., 2020; Funke et al., 2020). Electing populist politicians has also non-economic consequences, such as undermining democratic institutions (Funke et al., 2020), erosion of social norms (Bursztyn et al., 2020), and even hate crime against immigrants (Müller & Schwarz, 2020; Romarri, 2020). My paper speaks particularly to the effects of electing populist politicians by demonstrating that increased populist representation can spread populist ideologies.

Second, this paper contributes to the literature on party competition, particularly regarding the supply-side of politics. I show that populist party representation affects mainstream parties' ideological positions. The paper closest to mine is Abou-Chadi and Krause (2020), who show that when the radical right barely reaches the electoral threshold of gaining a seat in the parliament, mainstream parties' positions on multiculturalism move closer to the radical right position. I provide evidence of a more general effect of increased seat share

and examine the impact on a broader policy dimension. Another difference to my paper is that Abou-Chadi and Krause (2020) study the question in a cross-country setting and use manifestos to measure party positions, which may overstate the response of the party leadership. I examine a set of parties in several elections within the same institutional setting and estimate an effect that stems from the reactions of individual candidates. More generally, my paper is related to the literature on the effects of political representation. This literature examines how party power (Ferreira & Gyourko, 2009; Folke, 2014; Freier & Odendahl, 2015; Lee et al., 2004; Meyersson, 2014; Pettersson-Lidbom, 2008) and politicians' personal characteristics influence policy (Bhalotra et al., 2014; Clots-Figueras, 2011; Hyytinen et al., 2018; Pande, 2003).

Finally, this paper contributes to the literature on estimating party positions. There is a large literature on using content analysis to estimate ideological positions from political text, most prominently from party manifestos (see e.g. Adams et al., 2006; Budge et al., 2001; Laver et al., 2003). Party manifestos are an important resource in the study of politics, but a significant caveat is that analysis is typically possible only at national level. Moreover, manifestos are strategic documents that reflect the position of the party leadership, and they are unlikely to coincide with the average position of the party's candidates. Another approach to estimating party positions is analysing voting records (Heckman & Snyder, 1997; Lee et al., 2004), which has the advantage of measuring actual policy decisions instead of campaign speech. The drawback is that the method uses information only on elected politicians. I add to this literature by using new data on individual candidates' preferences to determine parties' ideological positions. I also provide a methodological contribution by applying an underutilised model of latent variable estimation—item response theory—that can help overcome limitations in survey design.

The rest of the paper is organised as follows. Section 1.2. describes the institutional background of the analysis. Section 1.3. discusses the conceptual framework. Section 1.4. describes the data. Section 1.5. presents the measurement model used to estimate ideological

positions. Section 1.6. describes the empirical strategy and Section 1.7. presents the main results. Section 1.8. further explores possible mechanisms. Section 1.9. concludes.

1.2. Background

1.2.1. Political Parties in Finland

Both municipal and parliamentary elections in the past decades have been dominated by the Social Democratic Party, the Centre Party and National Coalition Party, who represent the political left, centre and right, respectively. Other parties that have continuously held seats in the parliament and in municipal councils include the Left Alliance, Green League, Swedish People's Party, and Christian Democratic Party. The emergence of the populist Finns Party (formerly known as True Finns) in the early 2000's represents a significant change in the previously very stable party system (Ylä-Anttila & Ylä-Anttila, 2015). Similarly to other populist parties in Europe, the Finns Party started to gain popularity following the Great Recession. Their vote share started increasing in the 2007 parliamentary and 2008 municipal elections, and it surged in the 2011 and 2012 elections. Since 2011, The Finns Party has been among the most successful parties in parliamentary elections, together with Social Democrats, National Coalition and Centre Party. The Finns Party was part of the government coalition from 2015 to 2017.[1]

Table 1.1 presents the vote shares of parties in municipal elections. In addition to the eight main parties, there are a number of small parties that generally do not have representation in the national parliament. Many municipalities also have local, often independent or one-agenda political groups that are not registered parties and are often formed just to participate in single elections.

In a 2019 survey (KAKS, 2020), voters placed Centre, Christian Democrats, Finns

[1]The party left the coalition mid term after the party leadership changed and majority of the party's MPs formed a new parliamentary group. The splinter party Blue Reform did not win any seats in the preceding elections.

Table 1.1: Party vote shares (%) in municipal elections

	1996	2000	2004	2008	2012	2017
National Coalition Party	21.6	20.8	21.8	23.4	21.9	20.7
Social Democratic Party	24.5	23.0	24.1	21.2	19.6	19.4
Centre Party	21.8	23.8	22.8	20.1	18.7	17.5
Green League	6.3	7.7	7.4	8.9	8.5	12.5
Finns Party	0.9	0.7	0.9	5.4	12.3	8.8
Left Alliance	10.4	9.9	9.6	8.8	8.0	8.8
Swedish People's Party	5.4	5.1	5.2	4.7	4.7	4.9
Christian Democrats	3.2	4.3	4.0	4.2	3.7	4.1
Others	5.9	4.7	4.2	3.3	2.6	3.3

Party, Swedish People's Party, and National Coalition to the political right, with National Coalition most on the right and Centre Party closest to the political centre. The majority of respondents place Left Alliance, Social Democrats and Green League to the political left. The Centre Party has an agrarian background, and as most Finnish municipalities are still relatively rural, it remains the dominant party in municipal elections. At the national level the Centre Party has a similar level of support as the Social Democrats, National Coalition, and since 2011, the Finns Party. The Finns Party, Left Alliance and Green League have somewhat higher support in parliamentary elections than in local elections. The Swedish People's Party is a centrist party that represents the Swedish speaking minority in Finland. Although it has been a part of most government coalitions since the Finnish independence, in the municipal level it is mostly present in regions with significant Swedish speaking populations.

The Finns Party is a self-identified populist party. The founder of the party Timo Soini has on several occasions described himself and the party as populist (see e.g., Soini, 2019). The party programs are nationalistic and conservative. In the 2006–2014 Chapel Hill Expert Surveys (CHES) it was classified as a radical right party (Bakker et al., 2015; Polk et al., 2017). The 2014 survey asked experts to rank which policy issues were most important for each party. Based on these responses the three most important issues for Finns Party were anti-elite rhetoric, and conservative positions on EU integration and social lifestyle (e.g.

Table 1.2: Party classification and most important issues. Source: CHES 2014

	Classification	Issue #1	Issue #2	Issue #3
Centre Party	agrarian/centre	decentralisation	urban vs rural	public services vs taxes
Social Democratic Party	socialist	public services vs taxes	redistribution	state intervention
National Coalition	liberal	public services vs taxes	deregulation	redistribution
Finns Party	radical right	anti-elite rhetoric	EU integration	social lifestyle
Left Alliance	radical left	public services vs taxes	redistribution	state intervention
Green League	green	environment	social lifestyle	multiculturalism
Swedish People's Party	regionalist	ethnic minorities	public services vs taxes	multiculturalism
Christian Democrats	confessional	religious principles	social lifestyle	public services vs taxes

LGBTQI+ rights, gender equality). Table 1.2 presents the rankings.

According to a 2009 survey by the Finnish public broadcasting company YLE, the majority of Finns Party supporters had previously voted for Centre Party or Social Democrats.[2] Finns Party also attracted supporters from National Coalition and Left Alliance, as well as voters who didn't vote in the previous election. An analysis of voter surveys reveals that in 2011 parliamentary elections 40 % of Finns Party supporters were blue collar workers, which is similar to the share of blue-collar workers among supporters of Left Alliance. Both voters of Finns Party and Social Democrats named the other party as their number two choice, whereas Finns Party supporters saw Left Alliance as too left-wing. A notable share of the party's support also consists of entrepreneurs, in which sense it resembles the right-wing National Coalition party (Rahkonen, 2011).

Ylä-Anttila and Ylä-Anttila (2015) suggest that key factors driving support for the populist party have been a scandal related to election funding in the 2007 parliamentary elections, and the European debt crisis, which was an important issue in the 2011 parliamentary elections. Particularly members of the Centre Party were implicated in the election funding scandal. The Finns Party also successfully started an immigration debate that dominated the media during the 2011 parliamentary and 2012 municipal elections. Opposing immigration together with welfare chauvinism remained key issues on the party's agenda.

[2]See https://yle.fi/uutiset/3-5725053

1.2.2. Municipal Elections

Finland has proportional electoral system with open party lists. Municipal elections are held every four years to elect the members of the municipal council.[3] The minimum size of a municipal council is determined as a step function of population, but the council can set the number of councillors higher. The number of seats ranges from 13 to 85. Candidates are nominated by registered political parties or by constituency associations established by eligible voters. The number of candidates on a party list can be up to 1.5 times the size of the municipal council, however, parties are rarely able to nominate the maximum number of candidates.

Municipal councillors are elected from multi-member districts, and votes are always given to individual candidates. The election result is obtained using the D'Hondt rule, in which each candidate is assigned a comparative index that is equal to the total number of votes obtained by the party list (candidate's party or electoral coalition[4]), divided by the candidate's rank within the party list. Candidate's rank within the party list is determined by her personal votes. For example, the first ranked candidate's (the candidate with the most votes within the list) comparative index is equal to total votes obtained by the party list divided by one, and the second ranked candidate's comparative index is the total votes obtained by the party list divided by two, and so forth. The council seats are allocated to the candidates with largest comparative indices in the municipality. Because of the electoral system, parties have an incentive to nominate as many candidates as they can, and even the largest parties have unknown candidates who get very few votes.[5]

Municipal councils are responsible for the municipal functions and the municipal economy. Municipalities in Finland are charged with a wide range of responsibilities, including provision of social and health care services, comprehensive schools, upper secondary schools,

[3]For the 2017 election the election day was moved from October to April, which made the 2012 term slightly longer.

[4]Local parties can form electoral coalitions, whereby in the seat allocation process the member parties are treated as a single party.

[5]For instance, about 10 % of Centre Party candidates received less than 10 votes in 2012 elections.

and vocational schools. They control the land use and construction of their area and provide water, energy, and waste management. Municipalities may also take on other services, contributing for instance to employment and housing. Consequently, municipalities are major employers and also constitute a significant share of all public spending. Municipalities have the right to collect income, corporate and property taxes. The municipal tax revenue covers approximately half of the municipal expenses. Central government subsidies and service fees both cover around 20 % of expenses. The central government subsidies constitute a significant share of the national budget.

1.3. Conceptual Framework

The econometric strategy is to estimate how an exogenous increase in populist party representation—due to randomness of close elections—influences ideological distances between parties. In other words, I examine how the presence of a populist party affects other parties' positions while holding voter preferences and all else equal.

Even when there is no change in voter preferences, the electoral threat posed by populist party can influence other parties' positions. In a closely related paper, Abou-Chadi and Krause (2020) argue that a challenger party can change the competitive space even if voter distribution remains unchanged, as gaining representation provides resources and media attention, making the party more electorally threatening. This may be true particularly for an emerging party. Moreover, mainstream parties may also react because of a perceived or expected change in voter preferences. On the one hand, parties may attribute the seats gained in close elections to shifts in voter preferences. On the other hand, mainstream parties can anticipate that with more representatives, the party is better able to influence voter preferences, either by convincing voters of its policies or by increased salience of its agenda. Legislative presence allows a party to take part in legislative bargaining, introduce proposals and try to convince other parties' councillors to support their proposals.

Seat shares also influence whether a party is part of the governing coalition or not. Relatively small shifts in parties' representation can influence policy outcomes (Fiva et al., 2018; Folke, 2014). Folke (2014) shows that party representation has significant effects on what policies are implemented, especially in terms of secondary policy areas. The interpretation is that these policies are determined according to relative allocation of power within the governing coalition, instead of bloc majorities. Small parties may also trade in support with their larger coalition partners—a populist party might for instance support another party's economic policies in exchange for support on its immigration policy. Both increased media attention and the impact on policies can then increase salience of the populist agenda and feed back into increased voter demand for populism (Rodrik, 2020).

To provide intuition and structure of how an exogenous increase in populist representation can influence other parties' ideological positions, I propose a simple model of party competition. It is based on a basic model of electoral behaviour with sincere voters and two parties. This static model illustrates the logic of mainstream parties' response to populist representation.[6] In the model there are two parties, one of which is a mainstream party, and one is a populist party. The populist party will always propose its most preferred policy, while the mainstream party has conflicting interests over influencing policy and maximising votes. Elections are proportional and the implemented policy is a convex combination of parties' proposed policies, weighted by their seat shares. Voters vote for the party whose proposed policy is closest to their own ideal policy.

First, as in standard models of spatial competition, the model shows that increased voter demand for more populist policies increases the mainstream party's incentive to move towards the populist position. Descriptive evidence shows that emergence of populist parties is associated with mainstream parties' shift to the right on the liberal-conservative dimension (see e.g., Guiso et al., 2017; Schumacher & Van Kersbergen, 2016; Wagner & Meyer, 2017). Second, the magnitude of the mainstream party's reaction varies depending on the strength

[6]The formal model is presented in Appendix 1.2.

of its policy focus. The more policy sensitive the mainstream party is, the lower pay-off it receives from converging towards the populist position. I then introduce an exogenous shock to parties' seat shares, whereby all else being equal, the seat share of the populist party increases and the mainstream party decreases. This shock creates disproportionality between vote shares and seat shares and can be thought of as resulting from random election outcomes between tied candidates. As a results, the mainstream party must converge more to obtain the same seat share.

1.4. Data

I exploit comprehensive data on individual candidates' political preferences. The data comes from a prominent voting advice application (VAA) by the Finnish public broadcasting company YLE. The VAA survey consists of statements on policy and ideological views, most of which are Likert-type questions, where the candidate is asked to respond how much she agrees or disagrees with the statement. The questionnaire is open to all candidates before the elections, and about a month before the election day the responses are made public for voters to find information about the candidates.

The purpose of VAA is to make the candidates' views public and thereby help voters compare and find suitable candidates. Voters can use the VAA to find candidates who hold similar views with them by filling the same survey. The VAA compares the voter's and candidates' answers and finds the closest candidates. Voters can also browse through candidate responses without answering the questionnaire themselves. Using the VAA is free of charge for both the candidates and voters. In Finnish elections votes are always given to individual candidates, which makes the VAA a particularly popular tool among voters. According to the national municipal election study from 2017, more than 40 % of the respondents said that the VAA had at least some influence over their voting decision. Among 18-34-year-old voters, the VAA from YLE was the most important source of information (Borg, 2018).

In a recent study, Ilmarinen et al. (2022) compare candidates' answers in the VAA with the Finnish Parliamentary Candidates Survey, which is a confidentially administered post-election survey. They show that policy positions computed from responses to the VAA are very strongly correlated with positions computed from the post-election survey. Therefore, it is unlikely that candidates respond strategically without the responses reflecting their policy positions.

Unlike most survey data on politicians, an important advantage of the VAA data is that it includes information also on the non-elected candidates. I have obtained the data on candidates' responses related to three municipal elections, 2008, 2012 and 2017. Just over half (53 %) of all candidates responded to the survey. Parties have an incentive to field as many candidates as they can, since the total number of votes the party receives determines the number of seats it will obtain. The number of candidates a party can nominate is 1.5 times the number of councillors to be elected, and parties often struggle to fill their candidate lists. Recruiting candidates who are not serious about running likely brings down the response rate.[7] Table A.4 in Appendix 1.1. reports how response probability is related to candidate, party and municipality characteristics. More experienced candidates (incumbent municipal councillors and MP's) are more likely to respond. Response rate is also somewhat higher among women, younger candidates, and in larger municipalities.

The VAA data allows me to obtain measures of party positions that originate from the opinions expressed by individual candidates, as opposed to just the party leadership. Individual candidates' views can then be aggregated to municipality level, which means that my measure of ideology has both cross-sectional and time variation. In addition to the VAA responses, the dataset contains information on municipal elections and municipalities' socio-economic characteristics. The data on elections is obtained from Statistics Finland and the Ministry of Justice. In addition to information on election outcomes, it includes information on the candidates' age, gender, and previous political experience. I also collect

[7]In comparison, in parliamentary elections parties can nominate much fewer candidates, and the response rate is about 90 % (see e.g, https://yle.fi/uutiset/3-10688075).

information on parties' electoral coalitions. Data on municipality characteristics is obtained from Statistics Finland. Descriptive statistics on municipalities, parties and candidates are available in the Appendix 1.1.

1.5. Measuring Ideological Positions

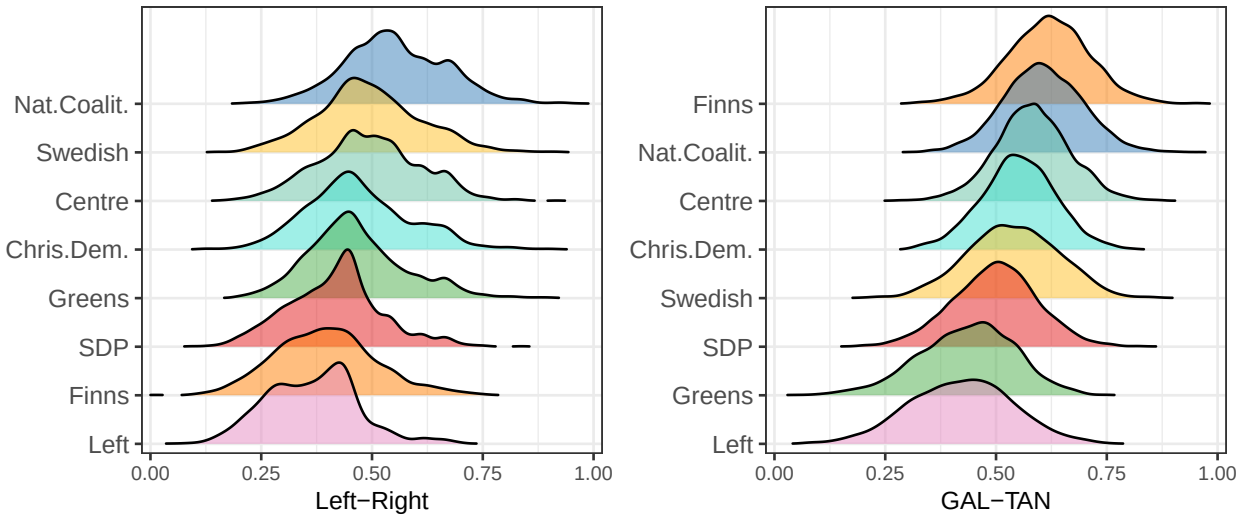
Because the list of questions in the VAA changes between election years, it is not possible to directly compare the survey responses. For instance, a year-by-year factor analysis might produce year specific rather than common factors. Item response theory (IRT) models can distinguish and estimate person and item parameters separately, whereas factor or principal component analysis only focuses on the respondent's latent trait. Although IRT models have been more commonly used to measure aptitude, the mathematical models can be as well applied to measure personality, beliefs, or attitudes (Ostini & Nering, 2006).[8]

Because the candidates who responded to the VAA in different years are not equivalent, parameter estimates from different samples are not necessarily on the same scale. However, as the surveys include a subset of common items, estimated parameters can be put on the same scale even though majority of the questions changes (Kolen & Brennan, 2004). The data from all the survey years is pooled together, and the parameters of the common items are constrained to be equal across years (Kolen & Brennan, 2004). The purpose of the anchor items is to separate respondent group differences from survey wave differences. This is possible due to the assumption that the values of the item parameters are a property of the item, not of the group that responded to the item. The respondent's ability is in turn assumed invariant with respect to the items used to determine it. In contrast, factor analysis focuses only on the latent trait.[9]

[8]IRT models are commonly used in psychological measurement, e.g., the Programme for International Student Assessment (PISA), National Assessment of Educational Progress (NAEP) and Trends in Mathematics and Science Study (TIMSS) rely on IRT (von Davier et al., 2019).

[9]The VAA data has been previously used by Savolainen (2019) to measure politicians' policy positions by constructing summary indices from selected survey items, and by Meriläinen (2019) by pooling the data and creating a single cross-sectional measure using principal component analysis.

Figure 1.1: Distributions of candidates on Left-Right and GAL-TAN dimensions



Note: Distributions across candidates from all survey years. The x-axis is increasing in more economically rightist (left panel) or more TAN (right panel) preferences.

I estimate a four-dimensional IRT model in order to achieve sufficient model fit and to be able to interpret and distinguish the dimensions form one another. However, I test the robustness of the econometric results against different dimensionality of the ideology space and show that the main results are not very sensitive to the dimensionality of the model (see Section 1.4.). For a more detailed description of the measurement framework, see Appendix 1.3.

The estimated latent trait distributions are presented in Figure 1.1. Table 1.3 provides examples of the statements that describe the dimensions. The first dimension, *Left-Right*, describes preferences on economic policy. This dimension has the highest explanatory power, as it captures to a large extent the traditional economic policy divide. Many of the survey items describing it concern provision of health care and social services, which make up the majority of local government responsibilities. More positive values indicate support for limiting the size of the local public sector, and opposition towards increasing taxation or progression in user fees. Left Alliance, Social Democratic Party and Finns Party are the most left-wing parties, and National Coalition is visibly the most right-wing party. Green League, Centre, Christian Democrats and Swedish People's Party are economically in the

Table 1.3: Examples of statements describing the different policy dimensions

Left-Right	""Privatisation of municipal health care would increase efficiency and lower the costs."	+
	"Which of the following services should we privatise? Elder care"	+
	"Which of the following services should we privatise? Day care"	+
	"Which of the following services should we privatise? Social welfare"	+
	"The old should have a universal right to a retirement home. "	−
	"To balance the municipal budget we should cut down municipal services"	+
GAL-TAN	"It is nowadays too easy to be admitted to social welfare."	+
	"My municipality should take in refugees."	−
	"We need strong leadership that can solve problems without the need for compromise".	+
	"The environmental and natural values in my municipality can be flexible if it can create more jobs."	−
	"Our society would have fewer problems if people were treated more equitably."	−
	"If one of the parents is at home, the children should not have a right to daycare."	+

Left-Right is increasing in right, and GAL-TAN is increasing in TAN. A plus sign indicates that agreement is associated with a more positive value on the dimension.

middle, although there is considerable dispersion within all parties.

The second dimension, *GAL-TAN*, captures candidates' social and cultural views.[10] More positive values indicate more conservative attitudes, support for authoritarian views, and negative attitudes towards immigration and environmentalism. It could be described as socially liberal-conservative, as it is often used to describe how political parties' are positioned in terms of non-economic issues.[11] Left Alliance and Green League are clearly on the more liberal end of the axis. Finns Party, National Coalition and Centre are relatively close to one another on the conservative end. Table A.5 in Appendix 1.1. presents correlations between local party groups' ideological position and party and municipality characteristics.

The other two dimensions of the estimated model are related to economic policy, and have less explanatory power over the variation in candidates' VAA responses.[12] Moreover, the anchoring of these dimensions across the survey years is weak, which makes their interpretation more difficult and reduces their usefulness as measures of ideology. Therefore, these additional dimensions serve first and foremost to filter out variation that does not fit into the two dimensions of interest. The third dimension describes preferences towards redis-

[10]The abbreviation stands for Green, Alternative, Libertarian and Traditional, Authoritarian, Nationalist.

[11]For instance, in the Chapel Hill Expert Survey assesses national parties on a general left–right dimension, economic left–right, and "social left–right dimension," which is also described as "new politics" or green/alternative/libertarian (GAL) and traditional/authoritarian/nationalist (TAN) dimension (Bakker et al., 2015; Polk et al., 2017).

[12]Distributions of candidates on all four dimensions are presented in Figure A.4 in Appendix 1.6.

tribution, particularly in terms of eligibility to public services and generosity of public sector services versus taxation. The fourth dimension concerns various local issues, it is described by items about provision of secondary municipal services (e.g., waste management, zoning), miscellaneous local activities and management of municipal property. Although the main results are not sensitive to the dimensionality of the estimated IRT model (see Section 1.4.), the four-dimensional model is preferable to a lower dimensional one as including the latter two dimensions reduces noise in the dimensions of interest.

1.6. Econometric Approach

To estimate the effect of Finns Party representation on other parties' ideological distance to Finns Party I use the following regression equation

$$Y_{pmt} = \alpha + \beta Populist_{mt-1} + X'_{pmt}\delta + \varepsilon_{pmt} \tag{1.1}$$

where Y_{pmt} is a measure of ideological distance between party p and Finns Party in municipality m at time t. $Populist_{mt-1}$ is the share of seats won by the Finns Party in the previous elections, X_{pmt} is a set of controls, and ε_{pmt} is the error term.

The main outcome of interest is a party's distance to the mean position of the Finns Party in the same municipality. This is constructed by first computing for each candidate the Euclidean distance to the local Finns Party mean. In the case of a single dimension, this is simply the square root of the squared difference (i.e., the absolute difference), and in the case of overall ideological distance, this is square root of the sum of squared distances across all dimensions (i.e., distance in four-dimensional Euclidean space). A local party's distance to Finns Party is constructed by first measuring the distance for each of its candidate, and then

averaging across the candidates.[13] If both parties were to shift to the same direction, the movements could cancel each other out and the relative distance would remain unchanged. In order to understand to what extent the changes in relative distances are driven by different parties shifting their positions, I also use the average position of a party as a dependent variable.

The challenge in the empirical analysis is to distinguish the effect of party representation from the effect of voter preferences, because the party composition of a municipal council is of course not random. The OLS estimates of equation (1.1) would likely be biased due to omitted variables. The seat share of a party in a given municipality may be correlated with unobserved characteristics that also affect other parties' behaviour in the municipality. For instance, if Finns Party candidates are elected in municipalities with preference for populist ideology, it would bias the results.

1.6.1. Identification Strategy

To identify the effect that electing one more Finns Party candidate has on other parties' ideological positions, I take advantage of close elections. Populist candidates who won in close elections will be elected in similar districts and under similar circumstances than other parties' candidates who won in close elections. The thought experiment is that additional Finns Party candidates are randomly assigned to some municipal councils. This increases the populist seat share and constitutes a "populist supply shock." Focusing on the exogenous increase in populist representation means that the influence of voter preferences is filtered out. I can then estimate how populist representation influences ideological positions of other parties. This impact could arise due to a strategic response to an increasing electoral threat posed by the Finns Party, or a change in beliefs and attitudes.

[13]The distance on dimension θ is given by $\frac{1}{N_{pmt}} \sum_i^{N_{pmt}} \sqrt{\left(\theta^p_{imt} - \bar{\theta}^{Populist}_{mt}\right)^2}$, where N_{pmt} is the number of candidates in party p in municipality m in year t, θ^p_{imt} is candidate i's position and $\bar{\theta}^{Populist}_{mt}$ is Finns Party's mean position in municipality m in year t.

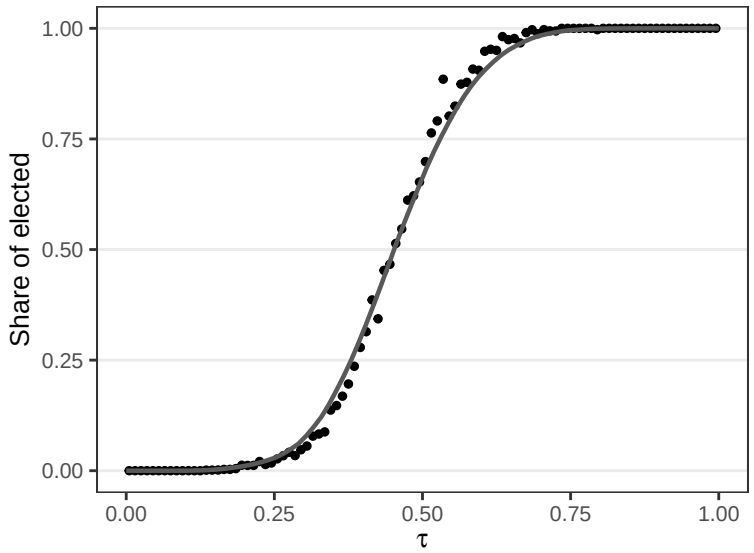
Because municipalities are unitary multi-seat districts with proportional elections, it is not possible to construct a forcing variable at the municipality level and use a regression discontinuity design. Instead, following Clots-Figueras (2011) and Hyytinen et al. (2018), I use variation created at the candidate level and aggregate it into a municipality-level instrument for populist seat share. Because of proportional open-list elections, whether a candidate is elected depends on her own votes, the votes of other candidates in her party, and the votes of all other parties in the municipality. Individual candidates can face multiple competitive margins, and determining electoral closeness is difficult. To identify electoral closeness, I apply a simulation approach introduced by Kotakorpi et al. (2017).

I simulate elections by resampling votes with replacement from the empirical distribution of votes, and recalculate winners based on the D'Hondt seat allocation rule, taking into account electoral unions between parties.[14] As in Kotakorpi et al. (2017), each resample is a multinomial experiment where the sampled votes represent trials, and empirical vote shares specify the probabilities for candidates to receive votes. Because the number of resampled votes is less than the actual votes, the simulated vote shares have deviations from their empirical counterparts, which produces variation in the simulated election outcomes. Therefore, closely elected candidates experience many wins and losses in the simulated elections, while most successful candidates are elected in all simulations, and most unsuccessful one are never elected.

Following Kotakorpi et al. (2017), I calculate for each candidate i the fraction τ_i of the bootstrap elections in which that candidate was elected. As there are several parties contesting on average 32 seats, there are many possible vote shifts within and between parties that can affect whether a candidate is elected or not. The simulation approach provides aggregates closeness across multiple margins to a single measure. Candidates who have τ_i close to one are sure winners, whereas candidates with τ_i close to zero are almost

[14] The number of votes in each resample equals 20 times the municipal council size, and number of simulated elections is $50,000$.

Figure 1.2: Share of elected candidates by fraction of simulations in which the candidate was elected.



Note: τ_i is the fraction of bootstrap elections in which a candidate was elected. Across candidates in election year 2004, 2008, 2012.

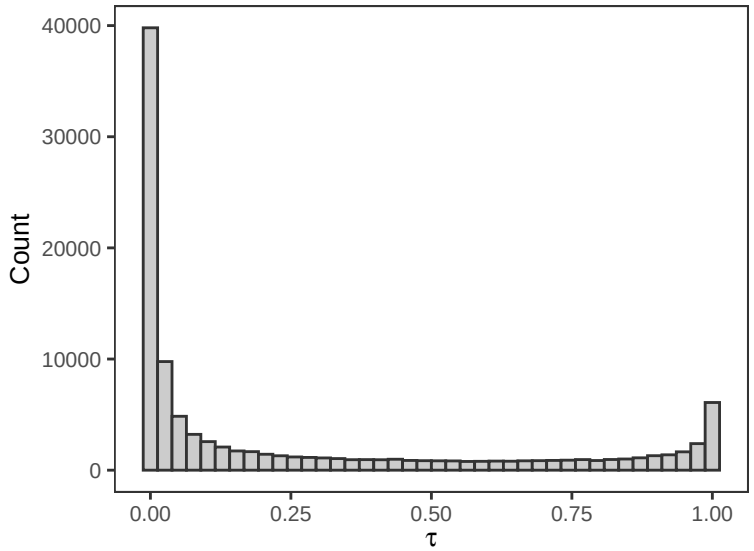
never elected.[15] Figure 1.2 plots the share of candidates who are actually elected for a given τ_i. The higher τ_i, the more often candidate i is elected in the simulated elections. Figure 1.3 plots the distribution of τ. In municipal elections there is a large share of candidates who have very low chance of being elected, which causes some bunching at the lower end of the distribution. Appendix Figure A.5 presents the distribution of candidates' electoral closeness for elected and non-elected candidates.

A candidate is considered to be "close" if her distance to the electoral cutoff is within some small bandwidth λ. I define the bandwidth for closeness as the range of τ where some candidates fall below the cutoff but are in reality elected, or are above the cutoff but are not actually elected. The benchmark bandwidth is set at $\lambda = 0.2$ to get as much variation in the instrument as possible.[16] I also conduct the estimation with different bandwidths and show that the results are robust to a wide range of bandwidths (see Appendix 1.4.).

[15]For a more detailed description of the bootstrap procedure, see Kotakorpi et al. (2017). For a related method, see Freier and Odendahl (2015), who add random noise to the observed votes to identify close elections.

[16]This bandwidth corresponds to on average a 0.28 percentage point difference in vote shares, or a difference of 5.5 votes, between closely elected and closely defeated candidates.

Figure 1.3: Distribution of candidates' electoral closeness



Note: τ_i is the fraction of bootstrap elections in which a candidate was elected. Across candidates in election year 2004, 2008, 2012.

Table 1.4 presents summary statistics for close Finns Party candidates. Overall, candidates' characteristics are well balanced between closely elected and defeated candidates. Population size is larger among the non-elected candidates, which reflects the fact that there are more candidates in larger municipalities and a smaller share of them are elected. As council size is determined by population, it is also a little bit higher. The difference in vote shares also reflects this—although the difference in votes is not significant, being elected is mechanically more likely in smaller municipalities with less candidates, which increases average vote shares for elected candidates. In larger municipalities there are on average more candidates per seat. These differences are considerably larger when we compare all elected candidates to those not elected (see Table A.6 in Appendix 1.1.). Table A.7 in Appendix 1.1. compares municipality characteristics for closely elected Finns Party candidates and other parties' closely elected candidates. It shows that different parties' closely elected candidates are on average elected in similar municipalities. Table A.8 in Appendix 1.1. shows that the distribution of candidates and seats won by different parties in close contests are very similar to the distribution of all candidates and seats won in different circumstances.

Table 1.4: Summary statistics for closely elected and defeated Finns Party candidates

	Elected			Not Elected				
	N	Mean	SD	N	Mean	SD	Difference	p-value
Age	405	47.58	13.07	488	47.43	13.27	0.15	0.86
Council size	434	38.29	14.57	514	40.49	16.41	-2.20	0.03
Female	434	0.26	0.44	514	0.25	0.44	0.00	0.92
GAL-TAN position	181	0.45	0.18	235	0.47	0.17	-0.01	0.48
Incumbent	434	0.13	0.33	514	0.09	0.28	0.04	0.05
Left-Right position	181	0.36	0.16	235	0.38	0.16	-0.02	0.28
No. parties	434	4.26	1.11	514	4.40	1.10	-0.13	0.06
Population	434	31666	62603	514	50145	105567	-18480	0.00
Population, urban %	434	36.78	42.38	514	42.65	44.31	-5.87	0.04
Unemployed, %	434	10.28	3.70	514	10.16	3.66	0.12	0.61
VAA Response	434	0.46	0.50	514	0.49	0.50	-0.03	0.44
Vote share, %	434	1.15	0.74	514	0.91	0.67	0.24	0.00
Votes	434	78.06	75.67	514	74.15	75.97	3.91	0.43

The table presents summary statistics for close Finns Party candidates in 2004-2012 elections. The Left-Right and GAL-TAN position are normalised to the zero one interval. Number of parties is the effective number of parties as suggested by Laakso and Taagepera (1979), computed as inverse of the sum of squared party vote shares.

With the simulated election outcomes, I can construct a municipality level instrument, which is simply the seat share of closely elected populists in the municipality. Equation (1.1) can then be estimated with 2SLS, where the Finns Party seat share, $Populist_{mt}$, is explained by the seat share of closely elected populists, $PopulistClose_{mt}$. This is the part of Finns Party seat share that is as good as random. When the share of seats won by Finns Party increases due to randomness of close contests, so does the total share of Finns Party seats.[17] The first stage of the 2SLS model is given by

$$Populist_{mt} = \pi PopulistClose_{mt} + X'_{pmt}\gamma + \nu_{mt} \tag{1.2}$$

[17]The Finns Party has on average 3 seats in municipalities where it has representation. When it has closely won seats, it has on average 4 seats, one of which is close.

and the second stage by

$$Y_{pmt} = \beta Populist_{m,t-1} + X'_{pmt}\delta + \varepsilon_{pmt} \tag{1.3}$$

Y_{pmt} is a measure of ideological distance between party p and Finns Party in municipality m in election year t, and X_{pmt} is a set of municipality and party controls. Because the treatment only varies at municipality level, standard errors are clustered at municipality level. I use this model to estimate how exogenous increase in Finns Party representation influences parties' ideological positions in subsequent elections in the same municipality.

1.7. Results

1.7.1. Ideological Distance to the Populist Party

Table 1.5 presents estimates for ideological distance to Finns Party. The unit of analysis is party p in municipality m in year t, i.e., the analysis is at local party level. The dependent variable is overall ideological distance (i.e., across all dimensions) between Finns Party and party p. I start by analysing the average effect across parties, and then move on to examine heterogeneous effects by party. The estimates in Table 1.5 show the average effect of Finns Party representation across parties and election years. All regressions control for year effects and lagged share of councillors who were closely elected. This is to account for the fact that the existence of close contests may not be random. Column (2) adds party controls, which are number of candidates by party, lagged party seat share, share of women, and average age of candidates. Column (3) adds municipality level controls, and column (4) adds party dummies. The municipality characteristics are from one year before the election. Including party and municipality controls increases precision of the estimates.

Panel A of Table 1.5 presents the instrumental variable estimates of the effect of Finns Party seat share on overall ideological distance between the Finns Party and other

Table 1.5: IV estimates for ideological distance to Finns Party

	Ideological distance to populist party			
	(1)	(2)	(3)	(4)
Panel A: IV				
$\text{Populist}_{m,t-1}$	-0.107^{*}	-0.117^{**}	-0.124^{**}	-0.095^{*}
	(0.056)	(0.055)	(0.057)	(0.055)
Panel B: OLS				
$\text{Populist}_{m,t-1}$	-0.107^{***}	-0.110^{***}	-0.111^{***}	-0.077^{**}
	(0.029)	(0.029)	(0.030)	(0.030)
Panel C: First stage				
$\text{PopulistClose}_{m,t-1}$	0.473^{***}	0.472^{***}	0.458^{***}	0.455^{***}
	(0.042)	(0.042)	(0.045)	(0.045)
Observations	3248	3248	3248	3248
K-P F-statistic	88	90	82	81
Party controls		✓	✓	✓
Municipality controls			✓	✓
Party dummies				✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, log population, shares of young and old, unemployment rate, median income, and education. All specifications control for lagged share of close seats in the municipality.

parties. As all the columns show, Finns Party seat share is estimated to have a negative and statistically significant effect on the average ideological distance between Finns Party and other parties in the municipality. The table presents standardised coefficients, so the estimate in column (1) means that when populist seat share increases by one standard deviation, on average other parties' distance to it decreases by 0.11 standard deviations. This corresponds to about 4 % of the average distance between mainstream parties and the populist party. Although individual parties' reaction varies, and if the populist party also shifts the effects may partially cancel out, we can see that on average an exogenous increase in Finns Party seat share causes ideological convergence.

The first stage Kleibergen-Paap F-statistic is significantly different from zero and

clearly shows that the instrument is strong and highly relevant predictor of Finns Party seat share. The IV estimates are only slightly larger than the OLS estimates in Panel B. The OLS model does not control for the endogeneity of populist seat share, and the estimates are more affected by having more controls. Panel C of Table 1.5 shows first stage estimates.[18]

Next, I examine alignment on different policy dimensions. Table 1.6 presents IV estimates for local parties' distance to Finns Party by ideological dimension. Panel A presents a set of specifications where the outcome is ideological distance to Finns Party on the Left-Right dimension, and Panel B presents specifications where the outcome is distance on the GAL-TAN dimension. The results show that the effect for overall ideological distance is driven by convergence on the GAL-TAN dimension. As the platform of Finns Party strongly emphasises social and cultural issues, rather than economic policy, with immigration being one of its most important issues, it makes sense that the party effect is most pronounced on this dimension. As discussed in Section 1.3., the magnitude of a party's reaction is expected to vary depending on the strength of its policy focus. Since most of the other parties emphasise more the economic policy dimension, adjusting positions on the GAL-TAN dimension may be both more beneficial and more feasible for most parties. The point estimates suggest that some alignment may also take place on the Left-Right dimension, but the estimates are not statistically significant. The effect of Finns Party representation has a much stronger and statistically significant effect on ideological convergence on the GAL-TAN dimension.

Table 1.7 presents cross-sectional results that show how the treatment effect varies over time. The treatment, i.e., the populist seat share, is based on the electoral results of the previous elections. In Panel A, the treatment is based on 2004 elections, in which the Finns Party was still relatively unknown. Obtaining three seats in the national parliament in 2003 had increased the public's awareness of the party, but in the 2004 elections it still fielded candidates only in one third of the municipalities and received just one percent of the vote.

[18] One standard deviation change in populist seat share corresponds to about two seats, and one standard deviation change in *PopulistClose* corresponds to about one seat.

Table 1.6: IV estimates for ideological distance to Finns Party: by dimension

	(1)	(2)	(3)	(4)
Panel A: Left-Right				
$\text{Populist}_{m,t-1}$	−0.059	−0.060	−0.064	−0.056
	(0.047)	(0.047)	(0.049)	(0.049)
Panel B: GAL-TAN				
$\text{Populist}_{m,t-1}$	−0.111**	−0.124**	−0.130**	−0.100*
	(0.056)	(0.054)	(0.057)	(0.054)
Observations	3248	3248	3248	3248
K-P F-statistic	88	90	82	81
Year dummies	✓	✓	✓	✓
Party controls		✓	✓	✓
Municipality controls			✓	✓
Party dummies				✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. The dependent variable in Panel A is ideological distance to Finns Party on the Left-Right dimension, and on Panel B ideological distance on the GAL-TAN dimension. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, log population, shares of young and old, unemployment rate, median income, and education. All specifications control for lagged share of close seats in the municipality.

Therefore, in the first cross-section, the margin I am exploiting is relatively insignificant. Moreover, other parties were not likely to see the Finns Party as a threat, and the views advocated by the Finns Party still seemed to be commonly rejected by voters.

In the 2008 elections the populist party was fielding more candidates and had a much wider presence across municipalities than before. The Finns Party multiplied its council seats in 2008, and its support continued to surge in the 2011 parliamentary elections, increasing the party's recognition and making it a serious competitor to other parties. The average effect on overall ideological distance over time seems to be mostly driven by convergence in 2012 and 2017 elections. The 2012 estimates are imprecise but relatively large in magnitude. If we look at the different dimensions, we can see that the increasing convergence is even more pronounced on the GAL-TAN dimension (see Table A.14 in the Appendix 1.5.). The results indicate that the effects are linked to the national salience trends that contributed to

Table 1.7: IV estimates for ideological distance to Finns Party: by year

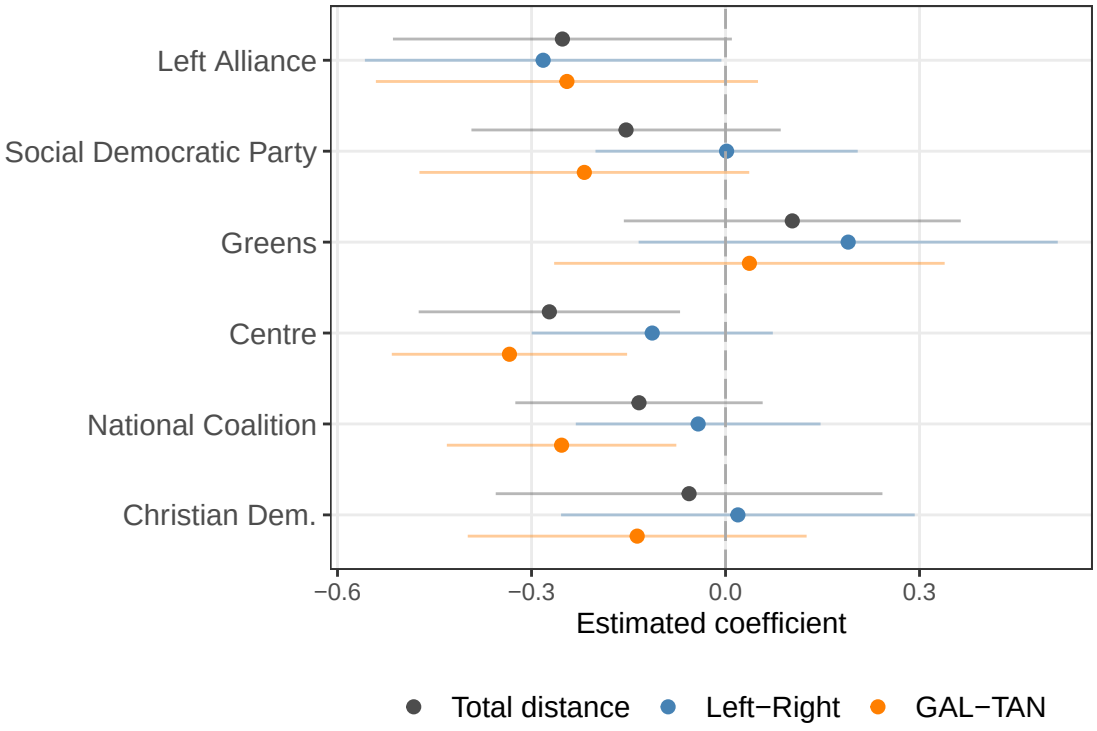
	Ideological distance to Finns Party			
	(1)	(2)	(3)	(4)
Panel A: 2008				
$\text{Populist}_{m,t-1}$	−0.039	−0.024	0.010	0.016
	(0.059)	(0.063)	(0.062)	(0.062)
Observations	801	801	801	801
K-P F-statistic	107	102	104	99
Panel B: 2012				
$\text{Populist}_{m,t-1}$	−0.053	−0.059	−0.072	−0.063
	(0.049)	(0.048)	(0.050)	(0.047)
Observations	1310	1310	1310	1310
K-P F-statistic	70	70	68	69
Panel C: 2017				
$\text{Populist}_{m,t-1}$	−0.146	-0.174^{*}	-0.197^{**}	-0.181^{*}
	(0.097)	(0.093)	(0.096)	(0.097)
Observations	1137	1137	1137	1137
K-P F-statistic	48	48	45	45
Party controls		✓	✓	✓
Municipality controls			✓	✓
Party dummies				✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, log population, shares of young and old, unemployment rate, median income, and education. All specifications control for lagged share of close seats.

the electoral success of the populist party.

The results so far have looked at average effects across political parties. However, parties in different positions in the political spectrum are likely to respond differently. Next, I estimate how populist representation affects individual parties. Figure 1.4 presents IV estimates both for overall policy distance and distances on the individual dimensions by party. Each dot represents an estimated coefficient from a 2SLS regression for a subsample that only contains a single party. For example, the first estimate shows that populist representation causes the overall ideological distance to decrease between the populist party and Left

Figure 1.4: IV estimates for ideological distances to Finns Party: by dimension and by party



Note: Dots represent estimated coefficients for $Populist_{m,t-1}$ from separate IV regressions with population and municipality controls. The estimates are effect sizes. Horizontal bars represent 95 % confidence intervals.

Alliance. The results are also reported in Table A.15 in Appendix 1.5.

Overall, Figure 1.4 shows the same pattern as Table 1.6, i.e., that ideological convergence takes place primarily on the GAL-TAN dimension. The estimates are somewhat less precise as statistical power is lower in the subsamples. Interestingly, the estimates show that distance to the populist party decreases across the political spectrum. We can observe convergence on the GAL-TAN dimension clearly for the Centre Party and National Coalition Party. The magnitude of the negative effects are also substantial for the Left Alliance and Social Democratic Party. The effect on Left-Right dimension is statistically significant only for the Left Alliance. Green League is the only party for which point estimates are positive, which indicates that distance between the green and the populist party increases.

According to the conceptual framework outlined in Section 1.3., all else being equal, weaker policy sensitivity is associated with more convergence. Indeed, the different responses

between the two liberal parties, Left Alliance and Green League, can be explained by their different issue emphasis. On the one hand, the Greens strongly prioritise issues on the GAL-TAN dimension, with emphasis on socially liberal policies, environmental protection, and pro-immigration policies. Therefore, any perceived shift towards the populist position could be electorally costly. On the other hand, the Left Alliance is first and foremost a working-class party and prioritises economic issues (Polk et al., 2017). Although it is economically close to the populist party, according to survey evidence many Finns Party supporters see the Left Alliance as too left-wing (Rahkonen, 2011). As the party seems to be competing over the same voters as the populists, moderating its position on both dimensions could help it attract more voters.

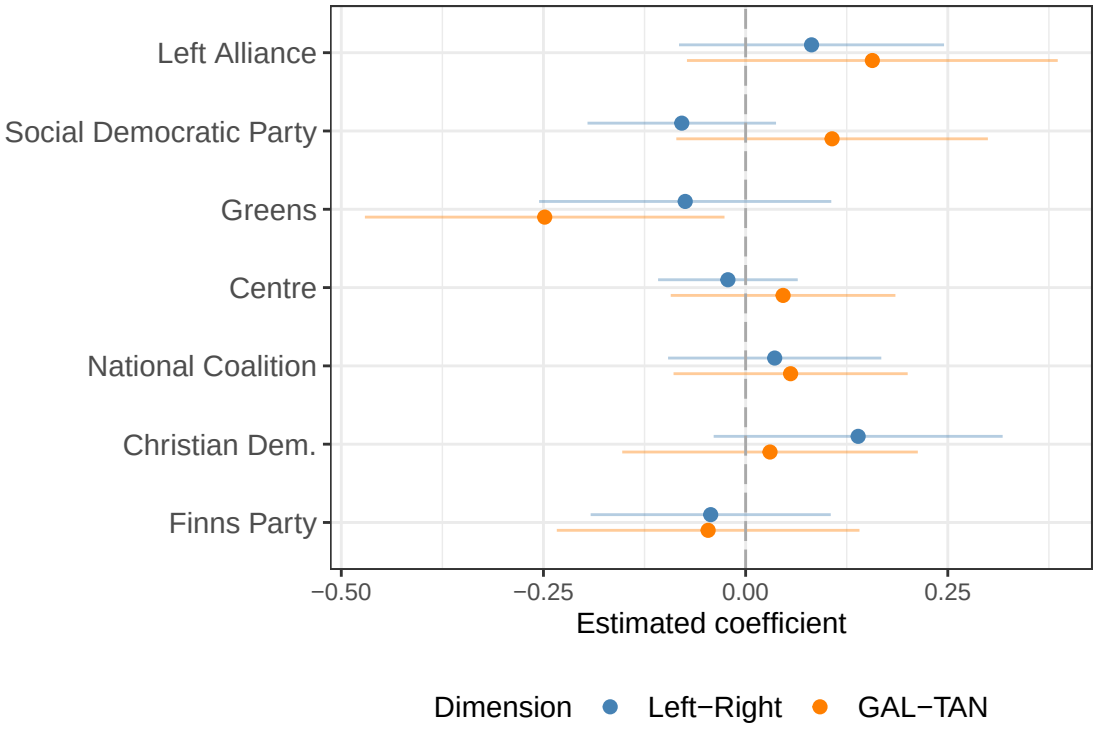
Alignment with the populist party on the GAL-TAN dimension can also be observed for the two large rightist parties, Centre and National Coalition. They are the two nearest parties to the populists on GAL-TAN dimension, which suggests that they have electoral incentives for convergence without being constrained by too large prior ideological differences.

1.7.2. Party Positions

We have established that ideological distance between Finns Party and most of the mainstream parties decreases. To understand whether mainstream parties are moving towards the populist position, or whether the populist party is becoming more moderate, I next examine the effect on average party positions.

Figure 1.5 presents estimates for 2SLS specifications in which the dependent variable is local party's average position on a given ideological dimension. A positive coefficient indicates a move to the right on the Left-Right dimension, or to a more conservative position on the GAL-TAN dimension. The results are also presented in Table A.16 in Appendix 1.5. Although the estimates are quite imprecise, they suggest that most parties take a slightly more conservative position following an increase in populist representation. The magnitude of the effect on GAL-TAN is largest for the two left-wing parties Left Alliance and Social

Figure 1.5: IV estimates for average party positions.



Note: Dots represent estimated coefficients for $Populist_{m,t-1}$ from separate IV regressions with population and municipality controls. The estimates are effect sizes. Horizontal bars represent 95 % confidence intervals.

Democratic Party. As in the analysis on relative distances, there is less action on the Left-Right dimension. Green League reacts clearly differently than the rest of the mainstream parties—an exogenous increase in the populist seat share causes the Greens to shift to a significantly more liberal position, i.e., move further away from the populist party.

The point estimates suggest that the populist party may be slightly moderating its position on GAL-TAN. Together with the previous results on distances between parties, the results indicate that convergence is to some degree simultaneous, i.e., mainstream parties become more conservative, and the populist party becomes a bit more moderate. For instance, the estimated effects on parties' positions suggest that Social Democrats shift to a more conservative position, whereas Figure 1.4 shows a decrease in the distance between the Social Democrats and Finns Party on the GAL-TAN dimension.

Table 1.8: IV estimates for ideological distances to Finns Party: rerunning, incumbent and new candidates

	Ideological distance to populist party			
	All candidates (1)	Rerunning (2)	Incumbents (3)	New candidates (4)
$\text{Populist}_{m,t-1}$	-0.118^{***}	-0.090^{**}	-0.152^{**}	-0.135^{**}
	(0.043)	(0.036)	(0.060)	(0.058)
Observations	38534	17178	8265	13439
Party controls	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓
Candidate controls	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$ Robust standard errors clustered at municipality level. Coefficients are standardised. All specifications control for year effects and lagged share of close seats. Candidate controls include age and gender. Candidate controls include age and gender. Column (1) includes a dummy for rerunners and incumbency. Party controls include lagged seat share, number of candidates, average age, and share of women. Municipality controls include lagged effective number of parties, log population, shares of young and old, unemployment rate, median income, and education.

1.8. Channels

1.8.1. Rerunning versus New Candidates

To study whether shifts in ideological positions are due to parties attracting new candidates with different views, or due to rerunning candidates adjusting their positions, I conduct a candidate level analysis for different subsamples: rerunning candidates, incumbent councillors running for re-election, and new candidates.

Table 1.8 presents the estimates. The dependent variable is again ideological distance to Finns Party. Column (1) is the same as the baseline regression, except now it is estimated on candidate level data. Column (2) includes only candidates who ran also in the previous election but were not elected. Column (3) includes current incumbents who are rerunning for office, and column (4) includes candidates who did not run in the previous election. The estimated coefficients are similar across the specifications with largest effect among incumbent candidates (column (3)) and smallest for the rerunning non-incumbent candidates.

Therefore, the candidates who ran before but were not elected seem to be most inflexible, while the new candidates that parties attract are similarly affected than incumbents.

These results are consistent with two interpretations, which are not mutually exclusive. First, adjustments in ideological positions are strategic. Incumbent candidates may have more information on successful platforms and be therefore more responsive to electoral competition than non-incumbents. Another interpretation is that exposure to the populist party's ideas and interaction with populist candidates—e.g., in the municipal council—influences individuals' preferences. For instance, the intergroup contact theory by Allport (1954) explains how close interaction can alleviate prejudice and conflict between groups. Equal group status, common goals, cooperation, and support of authorities are conditions under which contact can have positive effects, and all of these could be promoted by shared time in office. The fact that candidates who ran before but were not elected are less affected supports the latter interpretation.

1.8.2. Ideological Cohesion within Parties

It is possible that the observed ideological convergence is caused by other parties becoming more ideologically fragmented. Following Matakos et al. (2018), I measure intra-party heterogeneity as Euclidean distance between a candidate and her party's average position. The longer the distances are between candidates and their own party's mean, the less cohesive the party is. Table 1.9 presents the IV results. As the outcome is candidate's distance to her party's mean, positive coefficients indicate less cohesion. The estimates show that increasing populist representation influences only the populist party's own internal cohesiveness. The increased heterogeneity mostly stems from the fourth dimension which concerns secondary municipal services and miscellaneous local matters. Instead, other parties' ideological cohesiveness is not affected. The point estimates are not statistically significant and small in magnitude.

Table 1.9: Effect of Finns Party representation on within party heterogeneity

	Left (1)	SDP (2)	Greens (3)	Centre (4)	Chris.dem. (5)	Nat.Coalition (6)	Finns (7)
Panel A: Total distance							
$\text{Populist}_{m,t-1}$	−0.040	−0.022	−0.007	0.004	0.104	−0.025	0.158***
	(0.080)	(0.046)	(0.066)	(0.028)	(0.070)	(0.040)	(0.059)
Panel B: Left-Right							
$\text{Populist}_{m,t-1}$	−0.042	−0.016	−0.088	0.041	0.069	−0.040	0.083
	(0.069)	(0.038)	(0.078)	(0.030)	(0.063)	(0.042)	(0.059)
Panel C: GAL-TAN							
$\text{Populist}_{m,t-1}$	−0.006	−0.024	0.043	−0.028	0.058	−0.0001	0.055
	(0.077)	(0.037)	(0.068)	(0.026)	(0.062)	(0.036)	(0.062)
Observations	4494	8424	4641	11075	2534	10791	3706
Party controls	✓	✓	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓	✓	✓
Candidate controls	✓	✓	✓	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$ Robust standard errors clustered at municipality level. Coefficients are standardised. All specifications control for year effects and lagged share of close seats. Candidate controls include age, gender, incumbency, and a dummy for running in the previous election. Party controls include lagged seat share, number of candidates, average age, and share of women. Municipality controls include lagged effective number of parties, log population, shares of young and old, unemployment rate, median income, and education.

1.8.3. Influence on Refugee Policy

To better understand the mechanism through which populist representation influences other parties' behaviour, I also look at policy outcomes. Specifically, I examine if increased populist party representation influenced the probability of opening a reception centre for asylum seekers in the municipality. I only focus on the 2012 electoral term, as the vast majority of the new reception centres were opened in 2015 when the inflow of asylum seekers to Finland was at its highest. Table 1.10 shows results from a 2SLS regression in which the outcome on the 2012 electoral term is regressed on populist seat share in 2012 elections. The outcome in column (1) is a dummy for any reception centre, in column (2) a dummy for centre for adults and families, and in column (3) a dummy for unaccompanied minors. The outcome in column (4) is the total capacity of receptions centres in the municipality. We can see that although the estimates are negative in all columns, they are quite small and imprecise.

Table 1.10: Effect of Finns Party representation on reception centre openings

	Reception centre (1)	Centre for adults (2)	Centre for underage (3)	Capacity (4)
$\text{Populist}_{m,t-1}$	−0.028	−0.029	−0.013	−11.846
	(0.057)	(0.054)	(0.036)	(14.088)
Observations	294	294	294	294
Mean(Y)	0.33	0.28	0.14	86.32
Municipality controls	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$ Robust standard errors clustered at municipality level. Coefficients are standardised. All specifications include controls for share of close seats in municipality, number of candidates, mean candidate age, share of women, effective number of parties, log population, shares of young and old, unemployment rate, median income, and education. Dependent variable in column (1) is a dummy that takes value 1 if a reception centre was opened in the municipality between 2013-2016; in column (2) a dummy for a reception centre for adults and families; in column (3) a dummy for reception centre for unaccompanied minors; in column (4) total capacity of reception centres in the municipality.

In 2015 Finland received 32,000 asylum seekers, which was an almost tenfold increase compared to the previous years. Even though the absolute number of incoming asylum seekers was small compared to many other European countries, the increase was among the largest in Europe (EMN, 2016). The Immigration Service aims to run reception centres at close to full capacity, which meant that in 2015 there was a need to quickly expand capacity. Centres were opened in municipalities that had suitable buildings that could be used to house asylum seekers. In this light, the results in Table 1.10 show that indeed, local politicians were not able to systematically influence where reception centres were opened.

In general, as policies are made in coalition governments, individual parties' or councillors influence is expected to be small. Consequently, party effects on policy are expected to be smaller than the variation in representation. However, Fortunato et al. (2021) show that when responsibility is difficult to identify, voters assign accountability based on simple, easily observed cues, like seat shares and role in government. This could mean that even if increased populist representation did not much affect governance, voters may still assign more weight on the populist party due to increased representation.

1.9. Conclusions

This paper presents novel findings that help us understand how the emergence of populist parties can influence between-party competition and shape the political space. Supply of populism leads to mainstream parties adopting more populist positions, holding voter preferences constant. Therefore, mainstream parties appear to overreact to the electoral success of the populist party. The results show that populist representation can amplify the populist shift of the political space.

The analysis shows that increased electoral strength of the populist party leads to ideological convergence towards the populist party, which is mostly due to convergence on the liberal-conservative dimension. This dimension encompasses issues related to authoritarianism, immigration, and the environment. It is the primary policy dimension of the populist party. Increase in populist seat share causes distances between the populist party and other parties to decrease on this dimension. Ideological alignment is observable across the political spectrum—only the Green League shifts to a more liberal position and systematically distances itself from the populist party. As the Green League and the populist party hold opposing views on their primary policy areas, increasing distance might be the only credible strategy for the Green League. The economic dimension is the primary policy area for most mainstream parties, which makes shifting their position on the liberal-conservative dimension more feasible for them.

The impact on ideological alignment between the populist party and other parties becomes stronger over time as the populist party gains broader electoral support. The results suggest that convergence is to some degree simultaneous—mainstream parties move closer to the populist party, and the populist party adopts a slightly more moderate position. Moreover, the analysis suggests that one of the channels through which ideological convergence takes place is differential effect on incumbents and challenger candidates. Incumbent councillors seeking re-election adjust their positions towards the populist party more than

other candidates.

Chapter 2

When Facebook Is the Internet: The Role of Social Media in Ethnic Conflict

Abstract This paper investigates whether social media affects the intensity of ethnic conflict. To distinguish the potential effects of social media from those of the broader internet, I focus on the ongoing Myanmar conflict because in such context internet is mainly accessed via mobile phones and the Facebook app in particular. To identify the causal effect of social media on conflict, I take advantage of a shock in Facebook availability and use local variation in cell phone coverage as an exogenous determinant of social media availability. The results indicate that on average social media availability decreased conflict occurrence, and particularly organised forms of violence involving rebel groups. The analysis also reveals significant heterogeneity in terms of regional context, which suggests that inflammatory content on social media may escalate conflict in areas where ethnic tensions are particularly high.

2.1. Introduction

Social media provides a platform for sharing content with an unprecedented freedom and ease. They help individuals to find friends and job opportunities and firms to advertise and build business networks. The other side of the coin, however, is that social media can facilitate sharing of simplistic, false and inflammatory messages, and increasing anecdotal evidence suggests that online outrage may lead to violence offline. For example, in 2016, Human Rights Watch (2016) warned Facebook that the platform could be used for propaganda, censorship and surveillance. A UN investigation in Myanmar found that Facebook had been instrumental in spreading anti-Muslim hate speech (Human Rights Council, 2018), and a number of NGO's active in Myanmar also criticised Facebook for not preventing the spread of hate speech on the platform (Mozur, 2018). As a result, the CEO of Facebook was called to testify before the U.S. Congress about Facebook's role in ethnic violence in Myanmar, as well as about data privacy and misinformation campaigns during the U.S. Presidential election (The Washington Post, 2018).

This paper investigates the interaction between social media and ethnic conflict. The question of how social media affects political outcomes has accompanied the worldwide rise of social media, especially with respect to Facebook. The literature has argued that new communication technologies—cell phones, internet, social media—can facilitate uncensored communication and information exchange and enable political mobilisation under authoritarian regimes (Diamond, 2010). Yet, the new technologies can also be used for repression (Frantz et al., 2020). However, the endogenous nature of social media use poses serious challenges for causal identification, and very few studies can claim to present causal estimates. Recent exceptions include Bursztyn et al. (2019), Enikolopov et al. (2020) and Müller and Schwarz (forthcoming), who rely on the geographic origin of early adopters of social media, to identify its effect on protest participation an hate crime, respectively.

Distinguishing the effects of social media from those of the broader internet is em-

pirically very challenging. To this end, I focus on the ongoing conflict in Myanmar. The military regime in Myanmar has remained among the longest enduring dictatorships, although it faces strong democratising pressure. Not only is it intrinsically important to study Myanmar's political situation, especially its conflicts, but this setting is also important as a case that can shed light on other non-democratic regimes across the world. The setting of Facebook in Myanmar combines several aspects that make it ideal to study the effects of social media.

First, most people use mobile phones to access internet. Second, Facebook introduced a zero rated app, "Free Basics", that bundled a limited internet access with Facebook access for free over a significant period of time. Indeed, an important driver of increased internet penetration in many developing countries has been the emergence of zero rated apps. Zero rating means that a mobile network operator waives data charges associated with a particular app. As the cost of internet remains prohibitive for many people, zero rated content may often be the only justifiable way to access internet (Eisenach, 2015). The rapid spread of Facebook in the developing world has strengthened its dominant positions and led to situations in which internet is mainly accessed via Facebook, and Facebook effectively is the internet. A number of reports describe Facebook being so popular that it is considered synonymous to the wider internet (see e.g., PRI, 2017; Regan, 2019).

Third, Facebook's zero rating campaign was tied to one major wireless service provider, Myanma Post and Telecom (MPT). My empirical strategy is therefore to use mobile phone coverage by MPT as an exogenous determinant of social media use and use other providers' coverage as a control for the general effect of cell phone coverage. Following an empirical approach introduced by Olken (2009), I use a model of electromagnetic signal propagation to calculate topography-corrected cell phone coverage. The signal strength is primarily determined by distance to a cell tower and the terrain between a location and a cell tower but is also reduced by objects such as hills or dense foliage in the line of sight. The objective is then to compare conflict outcomes in townships that are similar in terms of

socio-economic and geographical characteristics but have different cell phone coverage due to terrain differences between the location and nearest cell towers. In addition, I conduct a difference-in-differences analysis that only uses within township variation before and after the zero rating campaign.

Information on cell phone towers is obtained from OpenCelliD, which is a crowd-sourced project to collect cell phone tower locations. To measure the outcome, ethnic violence, I use a georeferenced data on conflict events. The first data source is the GDELT Project (2019), which uses an automated system to extract information on conflict events from news media, by using natural language and data mining algorithms. It is the most comprehensive database on conflict events. In order to examine the reliability of this data, I conduct a comparative analysis with the Armed Conflict Location & Event Data (ACLED, 2019a). It is a widely used manually compiled data source, which makes it considerably narrower, but means there is less misreporting.

The results show that on average, Facebook availability has a negative, although imprecise, effect on conflict. Examining different types of conflict reveals that specifically violence between organised armed groups, which involves higher levels of organisation and use of conventional weaponry, decreases. Furthermore, examining different types of actors reveals that probability of conflict events involving rebel groups decreases. The difference-in-differences analysis exploits within township variation around the time of the Facebook campaign. The results also suggest that social media availability decreases conflict: townships with better cell phone coverage from MPT are less likely to experience conflict events after Free Basics was launched. The panel analysis corroborates that particularly the probability of conflict events involving rebel groups decreases. Exploring heterogeneity to different conflict types, actors, and local characteristics supports the interpretation that social media decreased violence via its impact on enhanced communication, monitoring and surveillance.

The results also demonstrate important regional variation. When I focus on Rakhine State, a region which is central in the military's crackdown on the Rohingya people (a pre-

dominantly Muslim ethnic minority), the results suggest that availability of Facebook led to a small increase in probability of conflict. Previous literature has shown that propaganda can be highly effective at influencing beliefs and behaviour (e.g., Adena et al., 2015; Voigtländer & Voth, 2015; Yanagizawa-Drott, 2014), and the results are consistent with the interpretation that hate speech on social media may have had a more substantial impact in a setting with pre-existing ethnic cleavages. The results indicate that the role of social media is highly context dependent.

The remainder of the paper is organised as follows. Section 2.2. briefly presents the related literature and discusses the channels through which social media can affect conflict. Section 2.3. describes the conflict situation in Myanmar and gives details of the Facebook campaign. Section 2.4. provides a description of the data. Section 2.5. describes the empirical strategy, and Section 2.6. presents the results. Section 2.7. concludes.

2.2. Related Literature and Conceptual Framework

This article contributes to the empirical literature on how communication technology influences political outcomes.[1] In particular, it speaks to the impact of social media in a context of civil conflict. I consider two broad channels through which social media could influence conflict. The first channel relates to the content on social media. Social media can be considered as an instrument of persuasive communication, which can influence receivers' behaviour by either changing their beliefs or their preferences. The literature distinguishes two types of models of persuasive communication (see DellaVigna & Gentzkow, 2010, for a review). The first is a belief-based model, in which agents use Bayesian updating when they receive new information. The second is a preference-based model, in which agents may not be fully rational and persuasive communication can influence their behaviour even if it does not contain new information. Instead, the effect may be driven by framing or increased salience. In addition to changing receivers' beliefs or preferences, seeing more of hateful content online

[1]For more thorough review of the literature, see Weidmann and Rød (2019) and Zhuravskaya et al. (2020).

could reduce social stigma and make expression of such views more acceptable.

In the context of Myanmar, there is evidence of social media has been used to spread disinformation and hate speech against ethnic minorities. For example, a disinformation campaign by the state created false Buddhist Facebook pages warning of planned "jihad attacks" by Rohingya Muslims (Martin et al., 2022). Such posts on social media could change receivers' beliefs about the threat posed by minority groups, provide information about how the government treats different minorities, as well as normalise and increase the salience of such views. The hypothesis that follows is that if social media influenced individuals' beliefs and preferences in this way, availability of social media should increase conflict. This channel should matter more for unorganised forms of violence, such as lootings and assaults. Furthermore, the effect should be more pronounced in areas with discriminated minorities such as the Rohingya, and with deep ethnic cleavages.

Bursztyn et al. (2019) investigate whether social media use in Russia is related to hate crimes and xenophobic attitudes. They show that although social media does not have an average effect, in areas where pre-existing level of nationalism is high, higher social media penetration leads to more ethnic hate crimes. Based on a survey experiment, the authors suggest that social media facilitates finding other intolerant people and thereby increases the number of people with xenophobic beliefs. Similarly in the U.S., Müller and Schwarz (forthcoming) find that anti-immigrant content on social media reinforces negative sentiment towards minorities, to the point that it increases anti-Muslim hate crimes.

In majority of the literature, both information, misinformation, and propaganda have been found to influence receivers' behaviour in the expected way. Studying Nazi indoctrination, Voigtländer and Voth (2015) show that the Nazi propaganda that sought to sow anti-Semitic beliefs was particularly effective in areas with a history of support for anti-Semitic parties. Similarly, Adena et al. (2015) examine the effect of radio before and after Hitler became the chancellor in Germany. The authors show that during the democratic period pro-government political news had a mitigating influence on Nazi support in areas

with radio access. After Hitler's rise to power, the radio content shifted to pro-Nazi propaganda, which then increased Nazi popularity. Furthermore, the persuasive communication was most effective in areas where anti-Semitism was historically high. Yanagizawa-Drott (2014) shows that radio propaganda also had an important role in inflaming the Rwandan genocide. The radio broadcasts contained strong anti-Tutsi rhetoric, encouraged violence as self-defence against an upcoming Tutsi takeover, and made it clear that the government would not punish violence and lootings. The broadcasts persuaded individuals to participate in violence and significantly increased killings. In contrast, Armand et al. (2020) show that defection messaging in Uganda was effective at mitigating conflict during an insurgency.

The role of internet as a low-cost channel of information may be especially important in an environment where traditional media is under state control. Guriev et al. (2021) suggest that wider access to internet may reduce government approval, particularly when traditional media is censored, by exposing corruption. Miner (2015) shows that in Malaysia, where the government held strict control over mass media, expanding uncensored internet penetration led to a decrease in support for the ruling party. Similarly, Enikolopov et al. (2011) find that in Russia availability of an independent TV channel decreased vote for the government party and increased vote for the opposition.

The second channel through which social media could influence conflict, is its impact on communication and coordination between agents, and consequently, the regime's enhanced monitoring and surveillance ability. On the one hand, access to better communication technology could improve the organisational capacity of rebel groups and insurgents, and therefore improve their ability to carry out attacks. On the other hand, it could also provide authoritarian governments with new methods for monitoring and surveillance, and therefore provide them with means to prevent attacks. The fact that in Myanmar the zero rated Facebook was offered by the state-owned wireless service provider MPT can make it easier for the regime to access user data and monitor internet traffic.

Consequently, empirical findings on the effects of communication technology in con-

flict situations are mixed. Pierskalla and Hollenbach (2013) demonstrate that in Africa, cell phone coverage is associated with an increase in violent events. Their interpretation is that improved ability to communicate, coordinate, monitor and spread information improves rebel groups' ability to organise attacks. When it comes to social movements and collective action, the literature has argued that the new technologies will promote political mobilisation by facilitating uncensored communication and information exchange (Diamond, 2010). Manacorda and Tesei (2020) show that in Africa, although access to cell phones has no average effect, it amplifies the effect of economic downturns on protest activity. Similarly in the case of social media, Enikolopov et al. (2020) demonstrate that during a protests wave in Russia in 2011, higher social media penetration had a significant positive effect on probability of protests and number of participants. Fergusson and Molina (2021) shows that Facebook access, proxied by its release in a given language, is associated with increased protests and decreased violent conflict.

In contrast, Qin et al. (2017) demonstrate that social media can be an effective instrument for detecting protests. They show the social media content can be used to predict protests and strikes one day in advance. They argue that the Chinese government has allowed relatively free social media due to its ability to exploit the information and use it to monitor local officials, gauge public sentiments and disseminate propaganda. Shapiro and Siegel (2015) present a formal model that illustrates how improvements in communication technology can reduce conflict by decreasing the ability of rebels to punish informants, and by increasing information flow to state forces. In a related paper, Shapiro and Weidmann (2015) find that expansion of cell phone coverage in Iraq decreased insurgent violence. The authors suggests that access to cell phones was more beneficial for counter-insurgents, making it easier to covertly inform security forces of militia activity. They suggest that the different outcomes may be due to the government's differential military competence and ability to exploit such information. Rød and Weidmann (2015) find that autocratic regimes seeking to influence public opinion are more likely to expand internet access, as it provides them with

new tools for censorship and monitoring.

Yet another alternative is that instead of benefiting the military's counterinsurgency operations, social media may help ethnic armed groups avoid the military. Christensen et al. (2019) argue that the military purposefully initiates conflict with regional ethnic militias to bolster its legitimacy and retain control, especially of resource rich areas. Social media could improve armed groups' ability to get information and warn their members of military activity in the area, therefore reducing clashes between the military and armed groups.

If social media enhanced the military's ability for surveillance or increased organised armed groups' ability to avoid clashes with the military, availability of social media should decrease conflict, and the channel should matter more for violence involving organised armed groups. If social media increased the military's ability for surveillance, it should matter more in areas where the government lacks other means to gather information about rebel activity.

2.3. Background

2.3.1. Ethnic Conflict in Myanmar

Myanmar has been under military rule for most of its independence. The state has supported the domination of the Buddhist Bamar majority, while many of the country's numerous ethnic groups have been subjected to discrimination. According to the Human Rights Council (2018), the state's systematic marginalisation of many ethnic groups has served a deliberate purpose in motivating the military's powerful position in politics. The citizenship law from 1982 is an important source of ethnic conflict. It granted citizenship only to the so-called national races, and at the same time defined who belongs to Myanmar and who does not. A number of minority groups, including the Rohingya, do not have a national race status, but are instead seen as immigrants.[2] As a consequence, most have not

[2]For example, the government refers to the Rohingya as "Bengali", claiming that they are immigrants from Bangladesh.

been granted citizenship, and have been rendered de facto stateless (Human Rights Council, 2018).

During the past decade, Buddhist nationalism, anti-Muslim rhetoric and violence between Buddhists and Muslims has intensified. According to the Human Rights Council (2018), the violence is related to an anti-Muslim and anti-Rohingya campaign led by radical Buddhist organisations and the military officials. The campaign has sought to spread fear and hate, calling Muslims and Rohingya illegal immigrants, criminals, and terrorists. A database on influence operations similarly identifies a coordinated campaign by the state, which produced news websites, Facebook pages, and other online content to promote propaganda and disinformation, designed to incite violence against the Rohingya (Martin et al., 2022). Violence in Rakhine State—home to most of the Rohingya minority—flared up in 2012 and the Rohingya crisis has remained ongoing since then. Violent conflicts between the military and ethnic armed groups continue also in several other regions of Myanmar, including Chin, Kachin and Shan states.

The UN Human Rights Council has accused the government of human rights violations and war crimes due to its unlawful and disproportionate security operations against ethnic and religious minorities. A case against Myanmar has been brought to the International Court of Justice, accusing the government of genocide against the Rohingya. According to a UN Human Rights Council report (Human Rights Council, 2018), the security operations have been characterised by attacks against civilians and indiscriminate attacks, arbitrary arrests, torture, sexual violence, looting and destruction of property. One of the motivations for the operations seems to be dissuading civilians from getting involved in the ethnic armed organisations.

2.3.2. Zero Rated Facebook and Social Media Use

I focus on the role of Facebook, which is the dominant social media platform in Myanmar. According to StatCounter, during 2011–2018, Facebook constituted on average

almost 95 % of all social media use in Myanmar.[3] I focus on the zero rated bundle of apps called "Free Basics", a recent Facebook campaign to gain users in the developing world.[4] Free Basics is provided in participation with local mobile network operators, who agree to waive the data charges associated with the platform. It can only be accessed in the given countries and with a SIM card from one of the participating wireless service providers. The providers offering Free Basics are not paid by Facebook (Eisenach, 2015). In Myanmar Free Basics was only available through a single service provider, the state-owned Myanma Posts and Telecommunications (MPT). Because I do not have information on individuals' cell phone or internet use, I will use cell phone coverage by MPT as a proxy for availability of zero rated Facebook. The campaign was launched in Myanmar in June 2016 and discontinued in September 2017 (Singh, 2018).

The number of Facebook users is estimated to have increased substantially—with estimates as large as from 2 million users in 2014 to 30 million in 2017 (Singh, 2018). In a country where access to broadband internet is limited, cost of mobile data is high, but mobile phones are ubiquitous, availability to zero rated content represents a significant availability shock on internet access. According to GSM Association (2018), in Myanmar the cost of medium basket (mobile plan with 1 GB of data) was almost 20 % of income for lowest 40% of earners, and 8 % of average income. In 2018, 79 % of all internet traffic in Myanmar was consumed by mobile phones (We Are Social, n.d.). During the past decade, internet use has increased rapidly: from an estimated 1 % of population in 2010, to 8 % in 2013, and 31 % in 2017 (ITU, n.d.).

Numerous reports attest to Facebook being widely used as a source of news, it is used by the government and military officials for public communication, as well as for coordinated propaganda and disinformation campaigns seeking to stoke fear and violence against the Rohingya, and attack posts critical of the military (Martin et al., 2022; PRI, 2017; Regan, 2019). Reuters' investigative reporting found "more than 1,000 examples of posts, comments

[3]StatCounter's statistics are based on tracking page visits to particular sites.
[4]The platform was originally called Internet.org, and re-branded as Free Basics by Facebook in 2015.

and pornographic images attacking the Rohingya and other Muslims on Facebook" (Stecklow, 2018). The prevalence of Facebook was also noted by the UN investigation on Myanmar (Human Rights Council, 2018), which concluded that social media and Facebook had been used to spread hate speech. The chairman of the Mission stated that social media had "substantively contributed to the level of acrimony and dissension and conflict ... As far as the Myanmar situation is concerned, social media is Facebook, and Facebook is social media" (Miles, 2018).

2.4. Description of Data

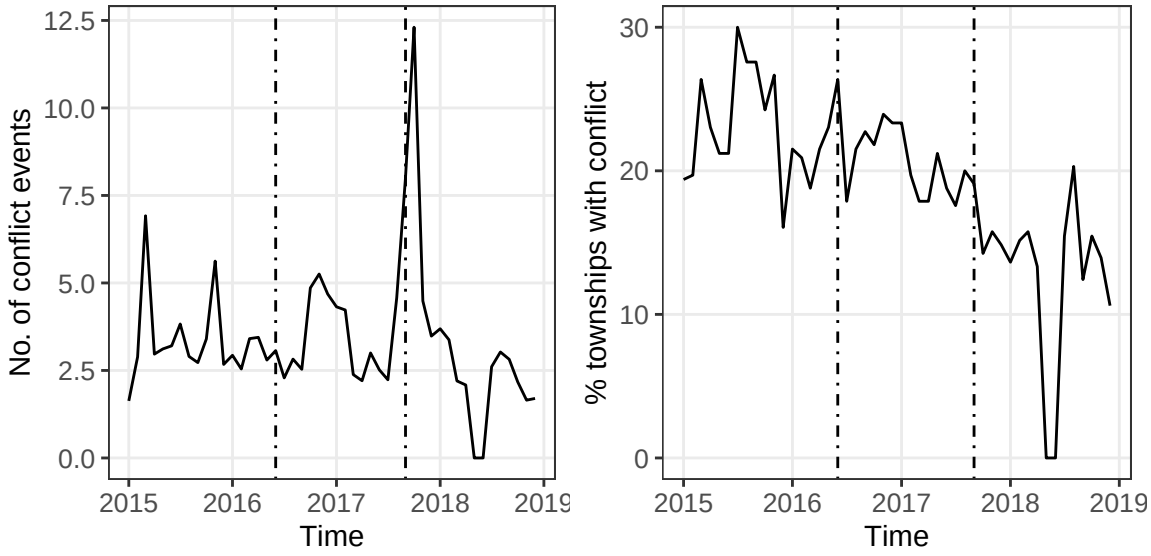
2.4.1. GDELT Data

I consider two different dependent variables: a binary measure of incidence of conflict in a township, and the number of conflict events in a township, weighted by population. My main source of conflict data is the GDELT Event Database (GDELT Project, 2019). GDELT is a project that uses language and data mining algorithms to monitor print, broadcast, and web news media from across every country in the world. The algorithms are used to find geographic reference of the actors and the action. Due to the automated collection, the GDELT database contains significantly more events than other georeferenced conflict data.

I consider conflict events in the CAMEO event categories *coerce*, *assault*, *fight*, and *conventional mass violence*. Most of the events fall into the categories coerce and fight. Coercion includes, for example, arrests, detentions, seizing and damaging property, and imposing restrictions on rights of civilians. Fight consists of all uses of military force, fighting and killings, which usually take place between organised groups. Assault includes the less organised forms of violence, such as physical assaults, abductions, assassinations, and use of explosive devices.[5] The number of events in the main categories is presented in Figure B.3 in Appendix 2.5.

[5]For a more detailed description of the event types, see Event Data Project (2012).

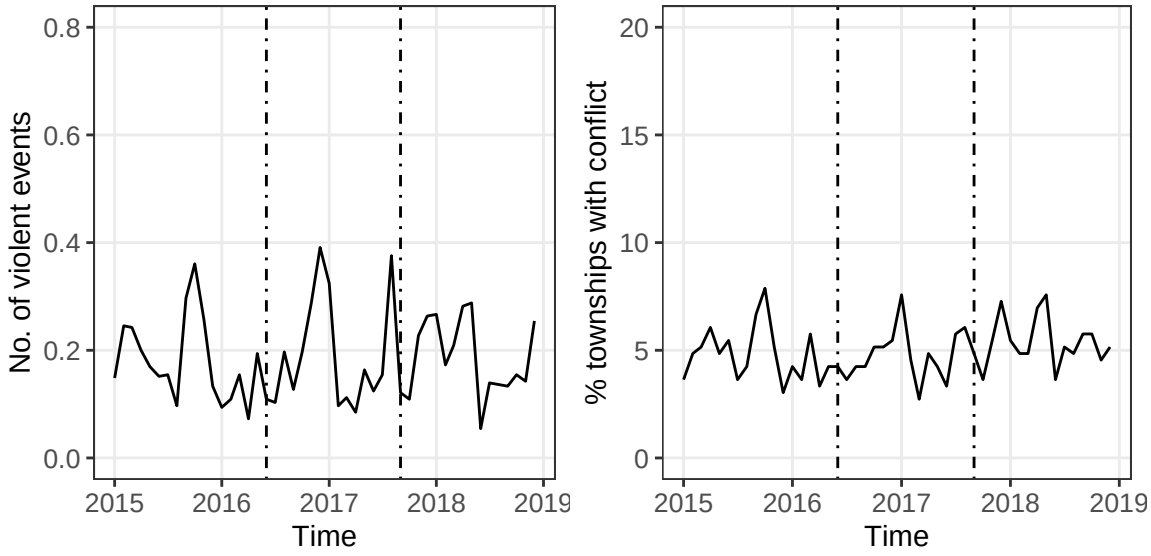
Figure 2.1: Number of conflict events and share of townships experiencing conflict - GDELT



Note: Left panel presents the average monthly number of conflict events across townships, and right panel presents share of townships experiencing conflict events. Vertical dashed lines represent the the beginning (June 2016) and end (September 2017) of the Facebook campaign. Data source: GDELT

Figure 2.1 presents the distribution of conflict events in 2015–2018. The database contains 85,258 events of violent conflict between January 1, 2015, and December 31, 2018. I limit the data to only events that that were matched at city or landmark level, which brings the number down to 53,322. The left panel shows the average monthly number of conflict events across townships. The increased activity in late 2017 marks the timing of the military's anti-Rohingya "clearance operation" in Rakhine State (Human Rights Council, 2018). The right panel of Figure 2.1 presents the monthly share of townships experiencing conflict events. Every month on average 19 % of townships experienced at least one conflict event. The Figure shows that the share of townships experiencing conflict has decreased since 2016. Although the number of conflict events spiked at the end of 2017, the events were geographically very concentrated. Figure B.4 in Appendix 2.5. plots numbers of different types of violent events.

Figure 2.2: Number of conflict events and share of townships experiencing conflict - ACLED



Note: Left panel presents the average monthly number of conflict events across townships, and right panel presents share of townships experiencing conflict events. Vertical dashed lines represent the the beginning (June 2016) and end (September 2017) of the Facebook campaign. Data source: ACLED

2.4.2. ACLED Data

Because the automated collection of GDELT data raises concerns about misreporting and duplicated data (Wang et al., 2016), I also conduct analysis with the Armed Conflict Location & Event Data Project (ACLED, 2019a; Raleigh et al., 2010), which collects data on political violence and protests.[6] The data is collected by researchers, and it contains considerably less events than GDELT (2,932 violent events in total between January 1, 2015–December 31, 2018). However, because the data is reviewed and checked, there is less incorrect reporting. Because ACLED uses a different categorisation of events, it allows me to further explore heterogeneity in conflict types.

The events in ACLED are categorised as violent events, demonstrations, and non-violent actions. My main focus is on violent events, which are further classified as *battles*, *explosions/remote violence*, and *violence against civilians*. Most frequent event type is battles, and more specifically armed clashes. Most frequent actor types are state forces and polit-

[6]Armed Conflict Location & Event Data Project (ACLED); https://acleddata.com

ical militias. Figure 2.2 plots the time series of violent events in ACLED data. The left panel shows the average monthly number of violent events across townships, and the right panel shows the monthly share of townships experiencing conflict events. During the sample period, every month on average 5 % of townships experienced at least one violent event. Unlike GDELT, ACLED data does not exhibit a decreasing trend in conflict occurrence. Figure B.5 in Appendix 2.5. presents the numbers of different types of violent events.

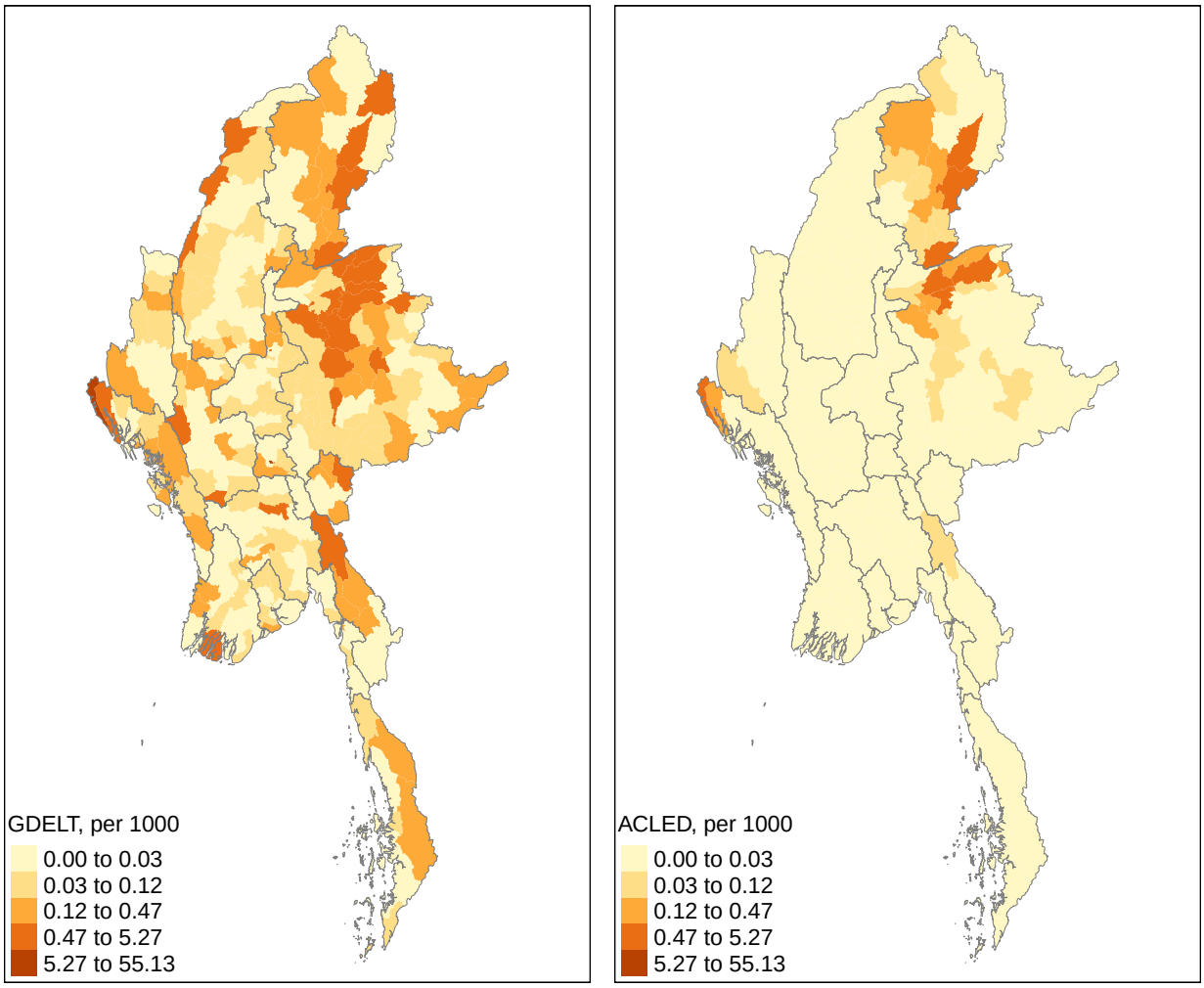
Figure 2.3 shows the geographic distribution of conflict events in the two sources. Both panels map the population weighted number of conflict events between 1 June 2016 and 31 August 2017. The figures show that conflict events are more pronounced in the peripheral areas, and particularly in Rakhine state (in Western Myanmar) which is home to majority of the Rohingya, and in the Shan (North-Eastern Myanmar) and Kachin states (Northern Myanmar). ACLED contains much less conflict events than GDELT, and the events are more geographically concentrated on the northern and eastern parts of the country.

2.4.3. Cell Phone Coverage

Information on the locations of cell phone towers is obtained from OpenCelliD, which is the largest open database of cell towers in the world. The data is mostly generated by crowdsourcing, i.e., by individual smartphone users who use apps that collect data for the OpenCelliD. The measurements of cell phone tower locations are collected by devices that utilise the wireless network provided by those cell towers, as well as from databases of other apps and contributions from GSM network operators.

In addition to cell tower locations, the data includes an identifier for the mobile network operator (MNO), the network technology (GSM, LTE, etc.), and date when the location measure was created. By the end of 2018, 33,116 cell tower locations were included in the data set. Several MNO's can have antennas in the same cell phone tower. Myanma Post and Telecommunications (MPT) has 14,340 cell phone tower locations, and other MNO's have 18,776 tower locations. Appendix Figure B.6 shows the locations of MPT's cell towers

Figure 2.3: Map of conflict events



Note: The chart presents number of conflict events between 1 June 2016 and 31 August 2017 per 1,000 inhabitants at township level. Breaks coincide with the 50th, 75th, 90th, 99th, and 100th percentiles of the number of events in GDELT.

and the expansion of the network during 2015–2017. Most of the network is located in the more populous area in central Myanmar, stretching between the three largest cities, Yangon, Nay Pyi Taw, and Mandalay. Appendix Figure B.7 plots the number of cell towers by MNO and creation date.

Most of the cell towers were recorded to the database in 2015 and 2016. Although the date when a cell tower location was recorded in the database might not be the same as when it was built, the increase likely reflects the actual expansion of the telecommunications sector. The Burmese telecommunications market was opened for foreign competition in 2014, prior

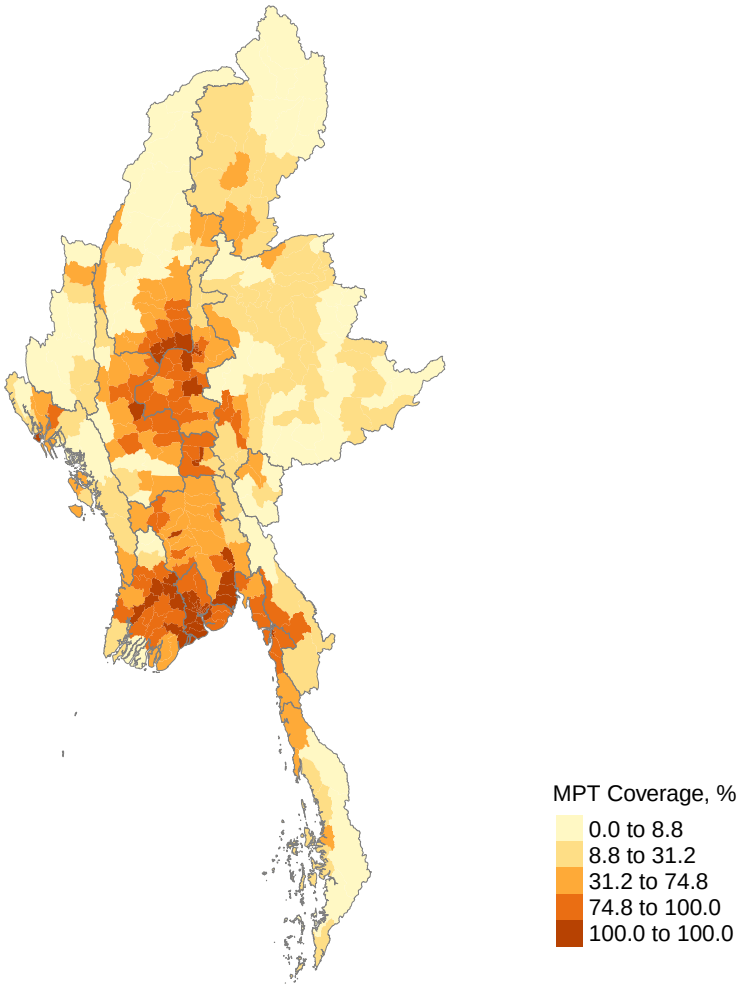
to which the state-owned MPT was a monopoly. As new firms entered the market in 2014, also MPT had to start expanding its network to remain competitive. Appendix Figure B.7 shows that MPT's network expansion has closely followed that of other service providers. When constructing the predicted cell phone coverage, I only use cell phone towers that were recorded in the database before September 2017. The time information is not used further so as not to introduce bias from confounding factors.

I use a radio propagation model to predict where the signal is strong enough for cell phone reception. The strength of cell phone signal in a given location is primarily determined by distance to the cell tower, and whether the receiver (i.e., cell phone) is in line of sight of the cell tower. Obstructions, such as hills, buildings, or dense foliage, reduce the signal. I apply the irregular terrain model (ITM) to calculate the predicted network coverage area. The model calculates predicted signal loss due to topography and distance between a transmitter and receiver. Validation studies have found that the ITM yields highly accurate predictions, and it has been widely used in professional radio planning (Crabtree & Kern, 2018). The model was used in a seminal paper by (Olken, 2009) to study the impact of television on social capital, and has since been used in a number of papers studying the impacts of radio and television (see e.g., Adena et al., 2015; Bursztyn & Cantoni, 2016; DellaVigna et al., 2014; Peisakhin & Rozenas, 2018; Yanagizawa-Drott, 2014).

Because I do not have all the technical details of the cell towers, the estimated coverage can be thought of as using a fixed radius around a cell tower and correcting it by topographic features that influence radio propagation. The prediction is calculated for 200m resolution grid cells.[7] These predictions are aggregated to obtain share of each township with cell phone reception. I do this separately for MPT and for the set of all other service providers. The share of township with coverage from MPT is the main independent variable. Figure 2.4 maps the geographic variation in the predicted MPT cell phone coverage, based on cell towers reported before September 2017. The predicted coverage is unevenly distributed,

[7]See Appendix 2.2. for a more detailed description of the coverage prediction.

Figure 2.4: Predicted MPT cell phone coverage



Note: The chart presents share of township with sufficient sufficient signal strength from MPT for cell phone reception.

with fairly comprehensive coverage in the central parts of the country, and large peripheral areas with very poor cell phone coverage.

Because I use crowdsourced data, it is likely that not all cell towers are included in the data, and there might be some error in the exact locations of the towers. I also need to approximate several technical parameters when conducting the coverage prediction. Measurement error in the independent variable may therefore bias the estimates towards zero. Nevertheless, I use this data instead of the commonly used GSM coverage maps from Collins Bartholomew, because with the latter it is not possible to differentiate coverage by

service provider, which is important for the empirical strategy. Moreover, when data is not available directly from service providers, the GSM maps are also based on data from OpenCelliD.

Measures of terrain elevation are obtained from NASA's Shuttle Radar Topography Mission (SRTM), which has generated publicly available high resolution topographic data of the world (Jarvis et al., 2008). I use the one arc second resolution (approximately 30 meters at the equator) in the cell phone coverage calculation. The signal propagation model also takes into account how land use—e.g., water, forest, cropland—affects propagation.

2.4.4. Local Level Characteristics

Information on population characteristics comes from the Myanmar 2014 Census. The main analysis is conducted at the township level.[8] Summary statistics for the townships are presented in Table B.1 in Appendix 2.1. Because I do not have information on the ethnic composition of the population at a disaggregated level, I use information on identity cards as a proxy.[9] Specifically, not having an identity card is used to proxy share of discriminated minorities. According to the Census, more than a quarter of the population does not have any identity card.

Because the census data is only available for township level and only for one year, I obtain additional information on population from WorldPop (2018). I use the population counts at 100 m spatial resolution that have been adjusted to match the corresponding United Nations population estimates. I aggregate the cells to village tract and township level to obtain estimates of village tract population as well as time series information.[10]

In addition, I use georeferenced data from several sources to control for location characteristics. These include nighttime luminosity (Elvidge et al., 2021), to proxy for local

[8]Myanmar consists of 18 states and regions, which are broken into 76 districts, that are divided into 330 townships, and 14,165 village tracts.

[9]Moreover, the available information may be misleading. According to the Census Observation Mission, most of the observed respondents who self-identified as Rohingya were either not enumerated in the census or their ethnicity information was skipped.

[10]Figure B.9 in Appendix 2.5. plots the geographic distribution of population.

economic development (Henderson et al., 2011; Weidmann & Schutte, 2017), locations of diamond and gemstone deposits (Gilmore et al., 2005; Lujala, 2009), as well as oil and gas fields (Lujala et al., 2007) to control for natural resources, land cover classifications (ESA, 2017) and weather conditions, particularly droughts (Vicente-Serrano, Beguería & López-Moreno, 2010). I use geospatial data provided by the Myanmar Information Management Unit (2019) to obtain administrative boundaries, locations of towns, railway, and road networks. I measure distances from the township centroid to the nearest major city (capital, state/region capital or district town), railway, major road, cell phone tower by MPT, and cell phone tower by another MNO. Finally, I use the SRTM elevation data (Jarvis et al., 2008) to complement the data with topographic characteristics, including elevation, slope, and terrain ruggedness. Descriptions of the data are provided in Table B.2, and township summary statistics are presented in Table B.1 in Appendix 2.1.

2.5. Empirical Strategy

My empirical strategy is to use mobile phone coverage by a mobile network operator offering the zero rated plan as an exogenous determinant of social media use. The aim is to compare otherwise similar locations that were differently exposed to Facebook access. To identify the causal effect of mobile phone coverage on conflict, variation in mobile phone coverage must be uncorrelated with all other determinants of the outcome.

The endogeneity concern is that cell towers are located strategically in areas that are more prone to conflict. I exploit plausibly exogenous local variation in cell phone signal strength, which is due to topographic variation between cell phone towers and receiver locations. First, I use the Irregular Terrain Model to predict where cell phone signal is strong enough for reception. I then compute the share of each township with reception and use that as the main independent variable. I conduct both cross-sectional and difference-in-differences analysis.

2.5.1. Cross-Sectional Analysis

In the cross-sectional analysis I estimate the following linear probability model

$$Y_i = \beta CoverageFB_i + \delta Coverage_i + X_i'\gamma + \lambda_d + \varepsilon_i \tag{2.1}$$

where Y_i is the outcome in township i, $CoverageFB_i$ is the predicted cell phone coverage by MPT and β is the key parameter of interest. My main outcome of interest is probability of conflict. Focusing on the external margin alleviates potential issues with duplicate events. To distinguish the effect of Facebook access from cell phone coverage in general, I control for cell phone coverage from other wireless service providers, denoted by $Coverage_i$. X_i is a set of township level controls, λ_d is a district fixed effect, and ε_i is the error term.

The source of exogenous variation that I exploit comes only from terrain differences between locations and cell towers. Because the topography-corrected cell phone coverage is very coarsely estimated due to a lack of technical details, I include controls for potentially confounding factors that may influence both conflict and cell phone coverage.

First, because cell phone towers are likely located so as to maximise covered population, to control for the demand factors, I include controls for nighttime luminosity as a proxy for income, area covered by agriculture land, area covered by urban settlements, log population, log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of households with electricity, mobile phone, landline phone, and internet at home. I control for weather conditions, particularly droughts, as they are correlated with topographic features and can also influence agricultural outputs and thus the opportunity cost of fighting (Miguel et al., 2004). I also control for the presence of gemstone deposits and oil and gas fields, as they have been associated with more severe conflict (Christensen et al., 2019; Lujala, 2009), and may also lead to better cell phone coverage to accommodate mining companies.

Second, as terrain features and distance to road and rail network can influence armed

groups' ability to operate as well as the cost of providing cell phone coverage I include second order polynomials of distance to major road, distance to railway, and distance to major town. I include area of the administrative unit and length of roads to further control for remoteness. Further controls for terrain features include second order polynomials of elevation, slope, and terrain ruggedness. I include district fixed effects to control for broader geographical trends, and I also cluster standard errors at the district level to account for possible contemporaneous correlation between neighbouring areas.[11]

The empirical approach is essentially an encouragement design (Duflo et al., 2007). I do not have information on individual's internet or cell phone use, but instead take advantage of the fact that if there is cell phone coverage, it is possible to use mobile internet, and if there is cell phone coverage from MPT, it is possible to use Facebook without data charges. Therefore, I estimate the effect of availability of zero rated Facebook, instead of Facebook use per se. Intuitively, better coverage from a wireless service provider is associated with higher probability that consumers subscribe to that provider. Availability of zero rated content constitutes a negative price shock and is expected to increase Facebook use. The identification relies on the assumption that predicted cell phone coverage is an exogenous determinant of social media use. After controlling for local population and geographic characteristics, differences in cell phone coverage are due to the terrain between the location and nearby transmitters. Then, cell phone coverage from MPT affects conflict only through increased Facebook availability.

It is likely that both the outcome and the independent variable are measured with some error. First, because the data collection in GDELT is automated, there may be duplicate reporting. Therefore, in majority of the analysis, I use a dummy variable as the outcome. The incidence of conflict events in an area is much less affected by duplicated reporting, or reporting bias caused by access to social media, than event counts.

Second, because the conflict data is based on monitoring the news, there might be

[11]District is one administrative level higher than township, and there are 76 districts.

some reporting bias. For instance, particular types of events, or events occurring in particular areas, might be more likely to be reported. Measurement error can bias the results if it is correlated with the treatment, i.e., cell phone coverage from MPT (conditional on observables). The main concern is that better cell phone coverage and availability of social media may lead to higher reporting. In that case, the effect of *CoverageFB* could be overestimated. To address this concern, I conduct a sensitivity analysis to gauge how dependent the effect of social media availability is on potential reporting bias. The analysis is presented in Appendix 2.3. In short, there does not appear to be any clear dependence between the effect of Facebook availability on conflict and conflict reporting. At most, the sensitivity analysis suggests the estimated based on ACLED may be attenuated.

2.5.2. Difference-in-Differences

In order to take advantage of the time variation in Facebook availability, I also conduct a difference-in-differences analysis. Because the information on population and spatial characteristics is constant over time, the analysis uses only within township variation to identify the effect of Facebook availability on conflict. I estimate the following model:

$$Y_{it} = \beta(CoverageFB_i \cdot Treat_t) + \tau_t + \lambda_i + Treat_t + \varepsilon_{it} \tag{2.2}$$

where Y_{it} is indicator for conflict in township i in time t. The unit of observation is township-month. *CoverageFB* represents the treatment intensity. $Treat_t$ is a dummy that takes value one from June 2016 onward. The time effect τ_t captures time specific effects that are common to all townships, and the township fixed effect λ_i captures township specific time invariant characteristics. The coefficient β represent the effect of Facebook availability during and after the Free Basics campaign. Social media use may take some time to influence users' beliefs and behaviour, and these effects may depend on the share of population using social media. Therefore, it is natural to consider the period after the Free Basics campaign also as

treated.

The difference-in-differences approach allows estimating the causal effect of treatment even if the treatment itself is not randomly assigned, but instead determined by the observable characteristics captured by λ_i. However, the fixed effects approach exacerbates measurement error in the regressor, which increases attenuation bias.

2.6. Results

2.6.1. Cross-Sectional Estimates

Table 2.1 presents the OLS estimates of model (2.1). The dependent variable is an indicator for any conflict events in the township in the treatment period, i.e. when Free Basics was available (from June 2016 until end of August 2017). The dependent variable in columns (1)–(3) is based on GDELT, and in columns (4)–(6) the outcome is based on ACLED. Estimates based on GDELT are imprecise, but the point estimates suggest that Facebook availability, i.e., cell phone coverage provided by MPT, leads to lower probability of conflict. The coefficient of *CoverageFB* in column (1) indicates that after filtering out the district fixed effects and controlling for cell phone coverage from other service providers, one standard deviation increase in MPT cell phone coverage is associated with 12 percentage point decrease in probability of conflict. The estimates based on ACLED do not show any average effect of Facebook availability on conflict.

If expansion of cell phone coverage was affected by conflict, the estimates could be confounded by reverse causality. To test the exogeneity of the topography-corrected MPT cell phone coverage, I conduct a placebo test, in which I estimate the same cross-sectional model using conflict data from before the treatment period. If conflict had driven lower cell phone coverage, *CoverageFB* should be associated with less conflict in the pre-treatment period. Table B.3 in Appendix 2.4. presents the results from the placebo test, which show that *CoverageFB* had no statistically significant effect on conflict before the treatment period.

Table 2.1: Cross-sectional estimates on probability of conflict

	Conflict dummy, GDELT			Conflict dummy, ACLED		
	(1)	(2)	(3)	(4)	(5)	(6)
CoverageFB	−0.120	−0.197	−0.135	0.045	0.011	0.013
	(0.119)	(0.140)	(0.129)	(0.039)	(0.050)	(0.051)
Coverage	0.078	0.261**	0.187	−0.042	−0.009	−0.018
	(0.120)	(0.129)	(0.118)	(0.042)	(0.051)	(0.052)
Observations	330	330	329	330	330	329
R^2	0.252	0.357	0.432	0.587	0.641	0.666
District dummies	✓	✓	✓	✓	✓	✓
Spatial controls		✓	✓		✓	✓
Additional controls			✓			✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. There are 76 clusters. The dependent variable is an indicator for conflict in a township between 1 June 2016 and 31 August 2017. The measures of cell phone coverage are standardised. Spatial controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area. Additional controls: share of agriculture land, share of forests, share of urban settlements, nighttime luminosity, presence of gemstones, share of oil fields, drought, log population, log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Table B.3, also presents estimates using conflict data from after the Free Basics campaign. The two sources of conflict data exhibit slightly different patterns—based on GDELT, the negative effect is most apparent during the treatment period, whereas in ACLED the negative effect appears only in the post-treatment period.

To study if the social media availability had an effect on the intensive margin of conflict, I estimate the model using logged number of conflict events as the dependent variable.[12] The results in Table 2.2 show no significant effect on intensity of conflict, but the point estimates again suggest a negative effect on conflict when the full set of controls is included. As the distribution of number of events is highly skewed, I also estimate a negative binomial model as a robustness check. As in the OLS models, the coefficient on *CoverageFB* is negative but imprecise. The estimates are presented in Table B.4 in Appendix 2.4.1.

As another robustness check, I also estimate the effect of population weighted cell

[12]One event is added to all observations because the logarithm is not defined at zero.

Table 2.2: Cross-sectional estimates on number of conflict events

	log(no. conflict events), GDELT			log(no. conflict events), ACLED		
	(1)	(2)	(3)	(4)	(5)	(6)
CoverageFB	−0.424	−0.455	−0.073	0.093	−0.137	−0.115
	(0.374)	(0.458)	(0.440)	(0.084)	(0.128)	(0.110)
Coverage	0.572	0.719	0.252	−0.122	−0.105	−0.103
	(0.406)	(0.484)	(0.467)	(0.096)	(0.131)	(0.119)
Observations	330	330	329	330	330	329
R^2	0.263	0.351	0.448	0.725	0.782	0.802
District dummies	✓	✓	✓	✓	✓	✓
Spatial controls		✓	✓		✓	✓
Additional controls			✓			✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. There are 76 clusters. The dependent variable is logged number of conflict events+1 between 1 June 2016 and 31 August 2017. The measures of cell phone coverage are standardised. Spatial controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area. Additional controls: share of agriculture land, share of forests, share of urban settlements, nighttime luminosity, presence of gemstones, share of oil fields, drought, log population, log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

phone coverage on conflict. The results are presented in Appendix 2.4.2. Using population weighted cell phone coverage does not have much effect on the estimates.

So far, the results do not show that social media availability had a systematic average effect on conflict. The estimates are negative, suggesting a negative effect on conflict, but they are imprecise. To better understand if and how availability of social media affects conflict, I next explore heterogeneity in types of conflict and actors involved. First, I examine whether the treatment effect varies by conflict type (Table 2.3). The outcome variables are indicators for different types of conflict events. The results show that social media availability and cell phone coverage influence different conflict types with varying intensity. Columns (1)–(4) show that based on GDELT, although all the estimates are negative, the effect is particularly due to decrease in fighting. The point estimate on assaults is also large in magnitude, but the effect is more imprecise. Events categorised as assaults include abductions, different types of physical assaults, and use of explosive devices. Based on

Table 2.3: Cross-sectional estimates on probability of conflict: by type of conflict

	Coerce (1)	Assault (2)	Fight (3)	Mass violence (4)	Battle (5)	Civilians (6)	Explosion (7)
CoverageFB	−0.030	−0.134	−0.214*	−0.084	−0.084*	0.030	0.011
	(0.153)	(0.160)	(0.119)	(0.059)	(0.046)	(0.062)	(0.026)
Coverage	0.057	0.132	0.206*	0.003	0.025	0.004	−0.061
	(0.152)	(0.155)	(0.120)	(0.057)	(0.045)	(0.056)	(0.040)
Observations	329	329	329	329	329	329	329
R^2	0.386	0.413	0.477	0.395	0.736	0.593	0.749
Data	GDELT	GDELT	GDELT	GDELT	ACLED	ACLED	ACLED
Mean(Y)	0.506	0.303	0.527	0.061	0.139	0.085	0.094
Controls	✓	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. There are 76 clusters. The dependent variable is an indicator for conflict of particular type in a township between 1 June 2016 and 31 August 2017. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, nighttime luminosity, share of oil fields, drought, log population, log population density, dummy for below median urban rate, share of working age (15–64 y.o.) population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

ACLED, social media availability causes a decrease in battles, but has no discernible effect on violence against civilians or explosions and other remote violence.

The event classifications are somewhat different between GDELT and ACLED, but the pattern is quite similar. Both fighting and battles are events that involve use of conventional military force. ACLED defines battles as exclusively taking place between organised armed groups, including state and non-state actors, whereas the GDELT definition also includes attacks against civilians. In a related study, Shapiro and Weidmann (2015) find that the expansion of cell phone infrastructure in Iraq similarly decreased insurgent violence. The authors suggests that access to cell phones benefited counter-insurgents, for instance by making it easier to covertly inform security forces of militia activity. The results in Table 2.3 indicate that a similar mechanism may be at work in the Burmese context. Another explanation is that instead of benefiting the military, social media benefited the ethnic armed groups and helped them avoid confrontations with the military. As discussed in Section 2.2., in the current context an effect on organised violence is consistent with the interpretation

Table 2.4: Cross-sectional estimates on probability of conflict: by type of actor

	State (1)	Insurgents (2)	Rebels (3)	Civilians (4)	State (5)	Militias (6)	Rebels (7)
CoverageFB	−0.053	−0.026	−0.126*	−0.168	0.014	−0.044	−0.034
	(0.138)	(0.049)	(0.070)	(0.152)	(0.044)	(0.049)	(0.051)
Coverage	0.163	0.114*	0.106	0.122	0.005	−0.031	0.018
	(0.152)	(0.058)	(0.068)	(0.152)	(0.042)	(0.040)	(0.039)
Observations	329	329	329	329	329	329	329
R^2	0.430	0.448	0.474	0.383	0.737	0.577	0.743
Data	GDELT	GDELT	GDELT	GDELT	ACLED	ACLED	ACLED
Mean(Y)	0.51	0.06	0.1	0.39	0.14	0.1	0.13
Controls	✓	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. There are 76 clusters. The dependent variable is an indicator for conflict event involving a particular type of actor in a township between 1 June 2016 and 31 August 2017. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, nighttime luminosity, share of oil fields, drought, log population, log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

that social media has been beneficial for prevention of violence by enhancing communication and surveillance.

The decrease in violence is driven by decreased fighting between organised armed groups, whereas other types of violence are not affected. If the information channel had substantially influenced individuals' participation in violence, it would imply a positive effect on coercion (which includes repression and violence against civilians or their rights or properties), assaults, or violence against civilians. Although the coefficient in column (6) is positive, the estimate is too imprecise to suggest any impact from social media availability.

To further explore the two channels, I also examine conflict by actor type. Actors can be both perpetrators or victims or violent events. Table 2.4 presents estimates from regressions where the outcome is a dummy variable that takes value one if a specific type of actor was involved in the conflict event. Columns (1)-(4) present estimates from GDELT. *State* refers to state forces, i.e., police forces, government, or military. *Insurgents* includes insurgents (rebels who attempt to overthrow their national government) and separatist rebels.

Rebels refers to armed and violent opposition groups and individuals. Both insurgents and rebels are mostly involved in events classified as fight. Civilians are most often involved in fighting and coercion (Event Data Project, 2012). Columns (5)-(8) present estimates from ACLED.[13] *Militias* include both political militias and identity militias. *Rebels* refers to rebel groups, defined as political organisations whose goal is to counter an established national governing regime by violent acts (ACLED, 2019b).

If the information channel had a substantial role, it would imply an increase in conflict events involving civilians, whereas the communication and surveillance channel would imply a decrease in events involving organised armed groups. In both data the negative effect is most pronounced for violence involving rebels. Therefore, the results are consistent with the interpretation that availability of social media was beneficial for prevention of violence. As the results indicate that availability of social media leads to conflict becoming less likely, it seems that the anti-Rohingya and other inflammatory content on Facebook were on average less important than enhanced communication and surveillance. OpenNet Initiative's report on Myanmar documents that the regime has engaged in pervasive internet filtering, internet shutdowns, surveillance, as well as cyberattacks on opposition groups (OpenNet Initiative, 2012), attesting to the regime using several methods to monitor its citizens online. Freedom House (2017) reports that the military appears to use interceptions for domestic surveillance.

2.6.2. Difference-in-Differences Estimates

I now turn to the difference-in-differences model. The dependent variable in columns (1)–(2) of Table 2.5 is an indicator for conflict events, and in columns (3)–(4) the outcome is logged number of conflict events. The coefficient on the interaction term corresponds to a one standard deviation change in *CoverageFB*. *Treat* is an indicator for the treatment and post-treatment period. All specifications include township fixed effects and year fixed effects, time varying controls for lagged log population, lagged log population density, lagged

[13] In ACLED, actor only refers to the perpetrator, and civilians are always victims of violent acts (ACLED, 2019b).

Table 2.5: Difference-in-differences estimates

	Conflict dummy		log(no. conflict events)	
	(1)	(2)	(3)	(4)
CoverageFB·Treat	−0.009	−0.001	−0.039**	−0.012
	(0.010)	(0.004)	(0.020)	(0.008)
Treat	−0.001	0.004	0.023	0.015*
	(0.012)	(0.005)	(0.023)	(0.008)
Observations	15792	15792	15792	15792
R^2	0.372	0.424	0.599	0.438
Data source	GDELT	ACLED	GDELT	ACLED
Township FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at township level are reported in parentheses. There are 329 clusters. Unit of observation is township-month. The dependent variable in columns (1)–(2) is an indicator for conflict in a township, and in columns (3)–(4) logged number of conflict events+1. The measures of cell phone coverage are standardised. All regressions include time varying controls lagged log population, lagged log population density, lagged nighttime luminosity, and drought, and an interaction between a linear time trend and time invariant controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, share of oil fields, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

nighttime luminosity, and drought, and interactions between a linear time trend and time invariant controls.

The estimates do not show any systematic change in probability of conflict but do suggest that intensity of conflict decreases with Facebook availability. The coefficient on *Treat* shows that on average, the number of conflict events is somewhat higher during and after the Free Basics campaign, but the events concentrated in the same townships as before the treatment period. Using population weighted cell phone coverage in the panel specifications yields somewhat stronger results, which also indicate a decrease in probability of conflict (see Table B.7 in Appendix 2.4.2.).

Table 2.6 presents estimates of Facebook availability on different conflict types. The

Table 2.6: Difference-in-differences estimates on different conflict types

	Coerce (1)	Assault (2)	Fight (3)	Mass violence (4)	Battle (5)	Civilians (6)	Explosion (7)
CoverageFB·Treat	−0.005	−0.003	−0.007	−0.004	−0.001	0.002	−0.007**
	(0.009)	(0.006)	(0.008)	(0.004)	(0.004)	(0.003)	(0.004)
Treat	−0.014	0.015**	0.019**	0.007*	0.004	−0.004	0.010***
	(0.010)	(0.007)	(0.009)	(0.004)	(0.004)	(0.003)	(0.004)
Observations	15792	15792	15792	15792	15792	15792	15792
R^2	0.354	0.334	0.355	0.427	0.402	0.168	0.242
Data	GDELT	GDELT	GDELT	GDELT	ACLED	ACLED	ACLED
Township FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at township level are reported in parentheses. There are 329 clusters. Unit of observation is township-month. The measures of cell phone coverage are standardised. All regressions include time varying controls lagged log population, lagged log population density, lagged nighttime luminosity, and drought, and an interaction between a linear time trend and time invariant controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, share of oil fields, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

outcomes are dummy variables that take value one if there was at least one conflict event of that type in the township in a particular month. The estimates exhibit less heterogeneity than in the cross-sectional specification. The coefficients are largest in cases of fighting and explosions and remote violence, but only the effect on remote violence is statistically significant. However, when I examine different actor types, the pattern is same as in the cross-sectional specification in Table 2.7. This supports the conclusion that on average, social media availability reduced conflict involving organised armed groups, and particularly rebels.

2.6.3. Effect on the Rohingya Crisis

The analysis so far has looked at average effects across all regions of Myanmar. Because there are several ongoing conflicts in different parts of the country, it is possible that the estimates are confounded by different regional effects. The previous literature has shown that the effects of media and access to communication technology on conflict may be very context specific (see e.g. Adena et al., 2015). There is a lot of anecdotal evidence that in

Table 2.7: Difference-in-differences estimates on different actor types

	State (1)	Insurgents (2)	Rebels (3)	Civilians (4)	State (5)	Militias (6)	Rebels (7)
CoverageFB·Treat	−0.004	0.001	−0.010**	−0.008	0.002	−0.002	−0.002
	(0.009)	(0.002)	(0.004)	(0.006)	(0.004)	(0.002)	(0.004)
Treat	0.009	−0.003	0.002	0.020**	−0.001	0.004	0.006
	(0.011)	(0.003)	(0.005)	(0.008)	(0.004)	(0.003)	(0.004)
Observations	15792	15792	15792	15792	15792	15792	15792
R^2	0.363	0.253	0.389	0.326	0.398	0.135	0.419
Data	GDELT	GDELT	GDELT	GDELT	ACLED	ACLED	ACLED
District FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at township level are reported in parentheses. There are 329 clusters. Unit of observation is township-month. The measures of cell phone coverage are standardised. All regressions include time varying controls lagged log population, lagged log population density, lagged nighttime luminosity, and drought, and an interaction between a linear time trend and time invariant controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, share of oil fields, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Myanmar Facebook has been used to spread anti-Muslim and anti-Rohingya propaganda, and therefore it could have had a different impact in the Rohingya conflict.

The first hypothesis discussed in Section 2.2. is that hate speech and other anti-Muslim content on social media could persuade individuals to commit anti-Muslim hate crimes. If social media increased negative sentiment against minorities such as the Rohingya, it should matter more in areas where there are strong prejudices between different ethnic groups. As many of the ethnic conflicts in Myanmar are regional, I now focus on the Rakhine state—home for most of the Rohingya population in Myanmar—to gauge the effect of social media on Rohingya-related conflict. There are historical grievances between the two largest ethnic groups in Rakhine state, the Rakhine Buddhists and the Rohingya (Human Rights Council, 2018), which can make the setting particularly susceptible to persuasive communication.

Because Rakhine consists of only 17 townships, I conduct the analysis at village level to retain enough observations. The population characteristics, apart from population counts and density that are derived from WorldPop, correspond to the township level measures.

I only consider conflict measured from GDELT as the ACLED data on Rakhine is very sparse.[14] Because of the small number of townships, I report robust standard errors, as well as p-values for wild cluster bootstrap standard errors at the township level (Cameron et al., 2008). Table 2.8 presents the estimates. In contrast to the previous results, in Rakhine villages Facebook availability is associated with a small increase in conflict. Although the estimates are somewhat imprecise, they are in stark contrast with the estimates presented in the previous sections and suggest that there is important regional heterogeneity. It is likely that especially the effect on number of events is likely biased down as they do not account for the large number of Rohingya fleeing from Myanmar during the conflict. There are reports of completely burned down Rohingya villages, and an influx of people into refugee camps in Bangladesh, which could mechanically reduce subsequent violence in the locations subject to deportations.[15] Columns (3)-(6) in Table 2.8 present estimates for the different conflict types in GDELT. The results provide suggestive evidence that in a high-tension setting where a persecuted minority is present, social media availability can amplify violence.

In addition, I complement the event data with satellite-detected fires and destroyed villages in northern Rakhine.[16] Although the data has a very limited geographic scope, the benefit is that it is not related to cell phone coverage, and it is not subject to potential reporting bias. The point estimates are positive but imprecise, providing suggestive evidence in support of the interpretation that cell phone coverage, through increased Facebook availability, leads to increased violence in the Rakhine state (see Table B.10 in Appendix 2.6.).

Although the Rohingya have been subjected to discrimination for decades, the anti-Muslim hate campaign and Buddhist nationalism has intensified during the past decade. Violence in the Rakhine state flared up in 2012 and since then there have been increasing reports of attacks, particularly against the Rohingya (Human Rights Council, 2018).

[14]Only 6 villages out of 1,059 experience conflict in the time period of interest.
[15]For information on the refugee crisis, see https://www.unocha.org/rohingya-refugee-crisis.
[16]The fire detection was conducted from 25 August to 25 November, 2017, and detection of destroyed or damaged settlements from August 2017 to March 2018.

Table 2.8: Cross-sectional estimates on conflict in Rakhine State

	Conflict dummy (1)	log(events) (2)	Coerce (3)	Assault (4)	Fight (5)	Mass violence (6)
CoverageFB	0.017	0.029	0.011	0.004	0.020*	0.002
	(0.012)	(0.037)	(0.010)	(0.009)	(0.011)	(0.007)
	[0.286]	[0.331]	[0.235]	[0.546]	[0.147]	[0.548]
Coverage	−0.006	−0.040	−0.017**	−0.004	−0.007	−0.004
	(0.013)	(0.028)	(0.008)	(0.007)	(0.011)	(0.003)
Observations	1058	1058	1058	1058	1058	1058
R^2	0.092	0.079	0.067	0.043	0.081	0.061
Control	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors are reported in parentheses. The p-values for wild cluster bootstrap standard errors at the township level are reported in square brackets. The dependent variable in column (1) is an indicator for conflict event, in column (2) logged number of conflict events+1, and in columns (3)-(7) a dummy for particular type of conflict event. Conflict data is from GDELT. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Therefore, these results are consistent with Adena et al. (2015) who show that the effectiveness of propaganda varies with the receivers' predisposition towards the message. Similarly, Bursztyn et al. (2019) suggest that social media use may aggravate xenophobic attitudes and lead to more hate crimes when intolerant views are already prevalent. The results presented in this Section support the view that pre-existing ethnic tensions and animosity may be an important determinant for the impact of social media in conflict.

2.6.4. Mechanisms

To further explore the mechanisms, I next explore heterogeneity of the effects to local characteristics. First, if social media impacts individuals' behaviour, it should have a larger impact in areas where minorities are present, and where there are more potential social media users. I therefore explore heterogeneity to presence of minorities, proxied by share of paperless, and to share of households with mobile phone, and share of households with

electricity as their main source of lighting. These variables are based on the 2014 census and reflect the pre-treatment levels. Second, if the government uses social media to gather information, it should matter more in areas where it lacks other means to do so. Therefore, I explore heterogeneity in terms of distance from major cities, distance from the road network, and share of households with landline phone. Finally, I also explore heterogeneity of the results to factors that could affect the opportunity cost of fighting: economic development, proxied by nighttime luminosity in 2015, and drought, as it impacts agricultural output.

Table 2.9 reports estimates from models where *CoverageFB* is interacted with an indicator variable for above median value of the variable of interest. The coefficient on *CoverageFB* in column (1) captures the effect of Facebook availability on conflict at below median value of share of households with electricity, and the interaction term captures the effect at above median values. The dependent variable in Panel A is a conflict dummy based on GDELT. The results suggest that in areas where more people have access to electricity or cell phones, as well as in areas with more people without identification documents, availability of social media is associated with higher probability of conflict. Instead, distance from major cities and from the road network amplify the negative effect, i.e., in more remote areas, availability of social media is associated with lower probability of conflict. These results are consistent with the interpretation that the government uses social media for surveillance and therefore it has a larger impact in remote areas. However, in settings where social media availability is likely to lead to larger increase in its usage, and in settings where discriminated minorities are present, the content on social media can amplify conflict.

The dependent variable in Panel B is a conflict dummy based on ACLED. The point estimates are much smaller and generally do not point to heterogeneous effect. Social media availability is estimated to have a statistically significant positive effect on probability of conflict only in areas where more people have access to electricity.

The results presented above support the interpretation that overall, social media availability has enhanced communication and ability for surveillance, which has on average

Table 2.9: Heterogeneous effects of Facebook availability

	Electricity (1)	Cellphone (2)	Paperless (3)	Landline (4)	City (5)	Road (6)	Nightlight (7)	Drought (8)
Panel A: Outcome: conflict dummy, GDELT								
CoverageFB	−0.243*	−0.177	−0.209	−0.190	−0.076	−0.091	−0.164	−0.059
	(0.136)	(0.139)	(0.134)	(0.129)	(0.142)	(0.130)	(0.131)	(0.113)
CoverageFB·Electricity	0.006***							
	(0.002)							
CoverageFB·Cellphone		0.158**						
		(0.073)						
CoverageFB·Paperless			0.130*					
			(0.072)					
CoverageFB·Landline				0.077				
				(0.058)				
CoverageFB·City dist					−0.126*			
					(0.070)			
CoverageFB·Road dist						−0.139**		
						(0.063)		
CoverageFB·Nightlight							0.062	
							(0.076)	
CoverageFB·Drought								−0.112
								(0.091)
Observations	329	329	329	329	329	329	329	329
R^2	0.450	0.442	0.440	0.437	0.441	0.451	0.434	0.438
Panel B: Outcome: conflict dummy, ACLED								
CoverageFB	−0.048	0.016	0.052	0.012	0.025	0.004	−0.001	−0.023
	(0.060)	(0.052)	(0.044)	(0.072)	(0.058)	(0.051)	(0.055)	(0.056)
CoverageFB·Electricity	0.003***							
	(0.001)							
CoverageFB·Cellphone		0.054						
		(0.041)						
CoverageFB·Paperless			−0.067					
			(0.043)					
CoverageFB·Landline				−0.0002				
				(0.048)				
CoverageFB·City dist					−0.024			
					(0.040)			
CoverageFB·Road dist						0.018		
						(0.041)		
CoverageFB·Nightlight							0.023	
							(0.037)	
CoverageFB·Drought								0.058
								(0.039)
Observations	329	329	329	329	329	329	329	329
R^2	0.675	0.674	0.670	0.667	0.666	0.668	0.667	0.668

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. The dependent variable is an indicator for conflict event in a township between 1 June 2016 and 31 August 2017. The measures of cell phone coverage are standardised. The second variable in the interaction term is an indicator for above median value of the corresponding variable, except for droughts, which indicates strictly positive values. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

lead to lower probability of conflict. However, another possible channel through which social media could lead to less conflict, is its impact on local development. Expansion of cell phone coverage and internet access may have promoted development in those areas, leading to higher opportunity cost of conflict. To explore this potential channel, I estimate the effect of MPT cell phone coverage on local development, proxied by nighttime luminosity and population. The estimates do not support the view that cell phone coverage lead to higher incomes or population (see Table B.11 in Appendix 2.6.).

2.7. Conclusions

This paper studies the effect of availability of Facebook on conflict. I exploit geographic variation in cell phone coverage together with time variation in an availability of Facebook availability to estimate whether social media affects probability and intensity of conflict.

The results suggest that availability of social media may have had an average negative effect on conflict occurrence. Although there is no statistically significant average effect, examining different types of events and actors reveals a decrease in organised violence involving conventional military force, and in conflict events involving rebel groups. The results are more consistent with the communication and surveillance channel being useful in preventing violence, than social media content influencing violence. Exploring heterogeneity to local characteristics reveals that social media's mitigating effect on conflict is most apparent in more remote areas, where its impact on communication and surveillance may be more important.

When I look at the specific regional context of Rakhine state, where tensions between the majority ethnic groups and the Rohingya are high, I find suggestive evidence for a positive effect on conflict, consistent with the interpretation that hateful online content can increase violence in certain contexts. The heterogeneity analysis also supports this conclu-

sion, demonstrating that in areas with more potential social media users and with higher presence of discriminated minorities, social media availability is associated with increased probability of conflict. However, the results and their interpretation should be taken with some caution, as the data limitations mean that many variables are approximated. Although the results are consistent with the offered interpretations, they do not constitute proof that these channels explain the observed patterns. Without access to more detailed information about internet or cell phone use, it is difficult to further disentangle the effects.

Nevertheless, the influence of social media clearly depends on the local context in which it is introduced. While the analysis presented in this paper suggests that availability of social media mitigates conflict involving organised armed groups, the interpretation also implies that citizens are a subject to pervasive surveillance, lacking privacy and freedom of expression. The results also suggest that social media may exacerbate existing prejudices, potentially because of intentional disinformation campaigns. Therefore, the findings highlight the need for caution when introducing new technologies and online platforms to contexts with severe human rights abuses. There is a need for further research on the impacts of social media in different circumstances.

Chapter 3

Making the Cut: Close Elections and Local Welfare Policies

Joint with Nikolaj Broberg and Thomas Walsh

Abstract This paper investigates how political alignment affects the implementation of punitive welfare measures in the UK. In particular, we examine whether a legislator's party affiliation affects the rate of sanctions to unemployment benefits in the MP's constituency. To address the endogeneity of which party wins in a constituency and area characteristics, we use a regression discontinuity design based on close elections to compare the sanction rates across constituencies that are marginally aligned or unaligned with the central government. We find that implementation of the sanction regime is significantly more lenient in constituencies won by the government parties. Our findings suggest pork barrel politics can also influence the allocation of economic "bads", even within a highly centralised system, and can undermine institutions which should be neutral to local partisan considerations.

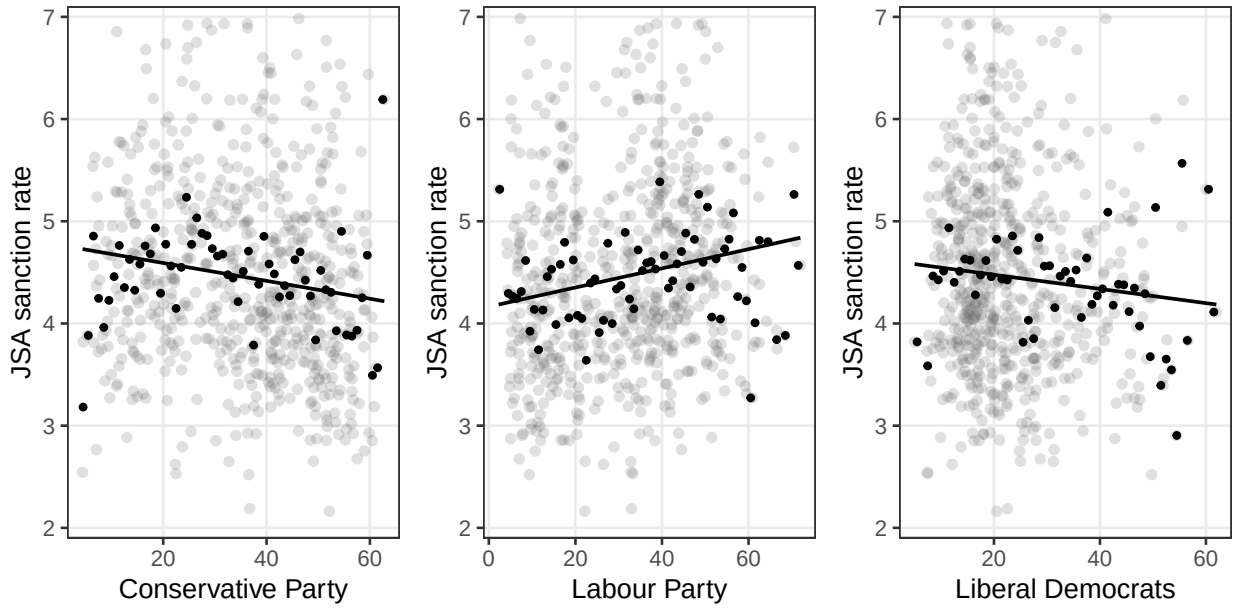
3.1. Introduction

Unemployment benefit sanctions are a common tool used by policymakers in many search-contingent unemployment insurance systems. However, the influence of party politics on economic institutions and welfare policy implementation, especially at the local level, remains unclear. Our paper aims to close this gap. In the United Kingdom, the setting of our investigation, the unemployment benefit system is characterised by two salient facts in the aftermath of the global financial crisis and ensuing recession in the late 2000s. First, national reforms to unemployment benefit sanctioning policy drove a large increase in the overall average sanctioning rate. However, this masks substantial variation in reform-response across areas. Second, according to the National Audit Office, the large heterogeneity in sanctioning rates across comparable areas cannot be entirely explained by differences in jobseeker behaviours.

This paper examines how the political alignment of a parliamentary seat influences the implementation of welfare reforms with a view to reduce non-discretionary public spending in Westminster constituencies. In particular, we examine the effect of political alignment on unemployment benefit sanctions. Although unemployment benefits are issued according to national legislation, there is considerable regional variation in the intensity of unemployment benefit sanctioning system. Figure 3.1 illustrates that there is a clear correlation between political alignment with the Conservative–Liberal Democrat government and unemployment benefit sanctioning policy. In this paper, we examine whether these trends are merely correlation between sanction rates and local economic conditions or jobseeker effort, or if this variation can be explained by politicians' demand for harsher or more lenient measures. We explore whether there is a causal effect from political alignment of a constituency to local sanction rates.

Understanding partisan influence on allocation mechanisms broadly, and the influence on economic institutions is important for several reasons. First, the state provides

Figure 3.1: Vote share in 2010 general election vs unemployment benefit Sanction rate (%)



Note: Binscatters of deciles of party vote share within a constituency in the 2010 general election and average Jobseeker's Allowance (JSA) sanction rate per claimant in the post-reform period from March 2012 to December 2015. Black points represent averages within running variable bins.

unemployment benefits to help jobseekers smooth consumption, and so partisan influence on the availability of social insurance has direct welfare consequences for affected jobseekers. Second, it is important to understand to what extent local economic outcomes vary due to differences in jobseekers' search behaviour across places versus differences in how their economic institutions operate. Third, this question can help explain some of the inequality in economic outcomes across areas. The UK has particularly high regional inequality compared to other advanced economies. Finally, this research can inform policy design which is robust to such partisan pressures.

We overcome the endogeneity of winning party and constituency characteristics by using quasi-experimental variation in election outcomes. To identify the effect of political control, we take advantage of close races in UK's first-past-the-post parliamentary elections. Intuitively, the idea is to compare electoral districts where the Conservative-Liberal Democrat coalition won against Labour by a small margin of votes, to districts where the Coalition was closely defeated. The observed difference in sanction rates represents an estimate of the

direct party influence on the practical implementation of the welfare reform.

The results show that the rate of unemployment benefit sanctions increased in constituencies won by Labour Party and decreased in constituencies won by Conservative Party or Liberal Democrats. The estimates indicate a drop of 0.8 percentage points at the electoral threshold, on a baseline rates of 4.5 %. In other words, the results imply 18 % lower sanction rates in Coalition controlled constituencies. The effect is driven by increased number of sanctions, while the number of unemployment benefit claimants does not significantly differ between Coalition-held and Labour-held seats. The effect is concentrated on the years immediately rafter the 2012 welfare reform, while prior to the welfare reform there is no difference in the sanction rates. The findings demonstrate that implementation of the welfare reform, and in particular the harsher unemployment sanctioning regime, was significantly more lenient in Coalition-held seats than in Labour-held seats.

Since welfare spending cuts are expected to be unpopular, legislators have an electoral incentive to mitigate the effects in their constituencies. While there is a rich literature on parties' and legislators' impact on distributive policies, their influence on the local implementation of nationally set welfare policies is not well explained by the standard models of legislative bargaining. Our hypothesis is that the party in power has more political power over public employees, and therefore over the practical implementation. Since close elections take place in more competitive constituencies, the Conservative party may have particularly strong incentives to exert effort to secure their support in those districts.

This paper contributes to several strands of literature. First, our paper contributes to the literature studying the relationship between representation and policy outcomes. Evidence from different countries and from different levels of government generally show that what party is in power matters for policy outcomes (see, for instance Lee et al., 2004; Meyersson, 2014). A large body of work demonstrates that legislative representation influences geographic distribution of public spending (see e.g., Golden & Min, 2013). We document a similar effect also for the distribution of spending cuts.

However, less is known about how politicians influence outcomes that are not directly under their jurisdiction, such as welfare benefits and sanction policy which is based on national legislation. Because the jobcentres in charge of administering unemployment benefits are under the jurisdiction of the Department for Work and Pensions, there is no direct link between an MP and jobcentres in her constituency. Therefore, this paper also contributes to the literature on bureaucracy. Previous literature on the interaction between politicians and bureaucrats has focused on questions of political accountability and bureaucratic selection (e.g., Colonnelli et al., 2020; Gallo & Lewis, 2012), whereas we examine a different perspective: how does alignment with the central government affect legislators' ability to influence public employees? Our paper therefore provides new information about factors that affect politicians' ability to control bureaucrats.

Finally, our paper contributes to the literature studying the political economy of welfare policies. In particular, our paper speaks to the political costs of fiscal consolidation policies (Alesina et al., 2012; Bansak et al., 2021; Brender & Drazen, 2008; Hübscher et al., 2021) and highlights not only allocation of economic goods to political co-partisans, but also the allocation of "bads".

The rest of the paper is organised as follows. Section 3.2. briefly reviews the related literature. Section 3.3. provides a description of the institutional setting and data. Section 3.4. describes the empirical strategy. Section 3.5. presents the main results and Section 3.6. presents a battery of robustness tests. Section 3.7. concludes.

3.2. Related Literature

A vast literature on the vote buying behaviour studies how parties and legislators direct public spending to influence their electoral success. There is extensive evidence of legislators, particularly in single member district systems, targeting spending to their electoral district (see e.g., Gagliarducci et al., 2011; Golden & Min, 2013). Formal models explain-

ing which voters are targeted are based on Dixit and Londregan (1996) and Lindbeck and Weibull (1987), which predict that swing voters are targeted, and Cox and McCubbins (1986) which predicts targeting of core voters.

In case of unequal representation, more representation for a district can translate to more bargaining power, which may lead to more targeted spending (see e.g., Ansolabehere et al., 2002; Dragu & Rodden, 2011; Knight, 2008). Similarly, representation by the party in power can increase targeted spending as government membership can give the legislators' greater proposal power, and hence greater influence over government spending (Albouy, 2013; Baron & Ferejohn, 1989). Political alignment between different levels of government has also been found to influence intergovernmental transfers. In the UK context, Fouirnaies and Mutlu-Eren (2015) show that government parties in England target discretionary funds to local councils controlled by co-partisans, particularly in tight races and around election years. Hanretty (2021) finds that the UK Towns Fund, which allocated funds with the aim to improve towns' infrastructure, skewed towards Conservative and marginal-Conservative seats in particular. Another strand of the literature documents distributive policies being targeted to leaders' or legislators' birth regions, the so called home town bias (Carozzi & Repetto, 2016; Gehring & Schneider, 2018; Hodler & Raschky, 2014).

The previous literature has focused almost exclusively on discretionary spending, which is more malleable to special interests (Albouy, 2013; Dahlberg & Johansson, 2002). Our investigation adds to the literature by examining the impact of representation and political power on non-discretionary spending. In this regard, a paper close to ours is Jennes and Persyn (2015), as it also considers formula-based spending directed at individuals rather than intergovernmental transfers, namely income tax, social security contributions and social expenditures, which are based on national legislation. A major difference is that they consider representation only in the executive branch. Other existing literature studying formula-based spending is focused on developing countries, where the influence of political factors is explained by weak institutions (see e.g., Banful, 2011; Litschig, 2012; Malik, 2021).

Legislators' influence on formula-based spending is not well explained by the basic models of legislative bargaining. Another possibility is that MPs are able to influence the practical implementation. A possible channel is through control over public employees. Therefore, our paper is also related to the literature examining interaction between politicians and bureaucrats. In general, the theoretical literature on delegation suggests that a principal prefers agents whose preferences are aligned with them (see e.g., Holmstrom, 1980).[1] The theory of motivated agents suggests that bureaucrats have political preferences and derive utility from implementing a specific political agenda, and therefore matching the preferences of politicians and bureaucrats can enhance organisational efficiency (Besley & Ghatak, 2005).

The emerging empirical literature confirms that politicians prefer to appoint politically aligned bureaucrats. Evidence for instance from Denmark (Christensen et al., 2014), Sweden (Dahlström & Holmgren, 2019), and Germany (Bach & Veit, 2018) points to politicisation of the bureaucracy, suggesting that politically aligned candidates are less likely to be replaced, and are more likely to be promoted to high public offices. Political alignment is also found to matter for lower ranking offices as well as personnel in public services (Akhtari et al., 2022; Brassiolo et al., 2020). Politician-bureaucrat alignment can also affect the intensive margin of public sector employment. Fiva et al. (2021) find that political shifts that cause top bureaucrats to become aligned with the local council lead to higher wage growth for the bureaucrats.

Our work also relates to a rich literature studying the effects of unemployment benefit sanctions on search behaviour and subsequent outcomes like reemployment wages and stability. However, our work aims to explore drivers of variation in sanction rates across localities. McVicar (2020) provides a recent summary of research in this area. Our findings also relate to the empirical literature seeking to explain why implementing major fiscal consolidation may not lead to an electoral backlash as often expected (Alesina et al., 2012; Brender & Drazen, 2008).

[1]For a review of the theoretical literature see e.g., Gailmard and Patty (2012).

3.3. Institutional Background and Data

3.3.1. Welfare Reform & Unemployment Benefits in the UK

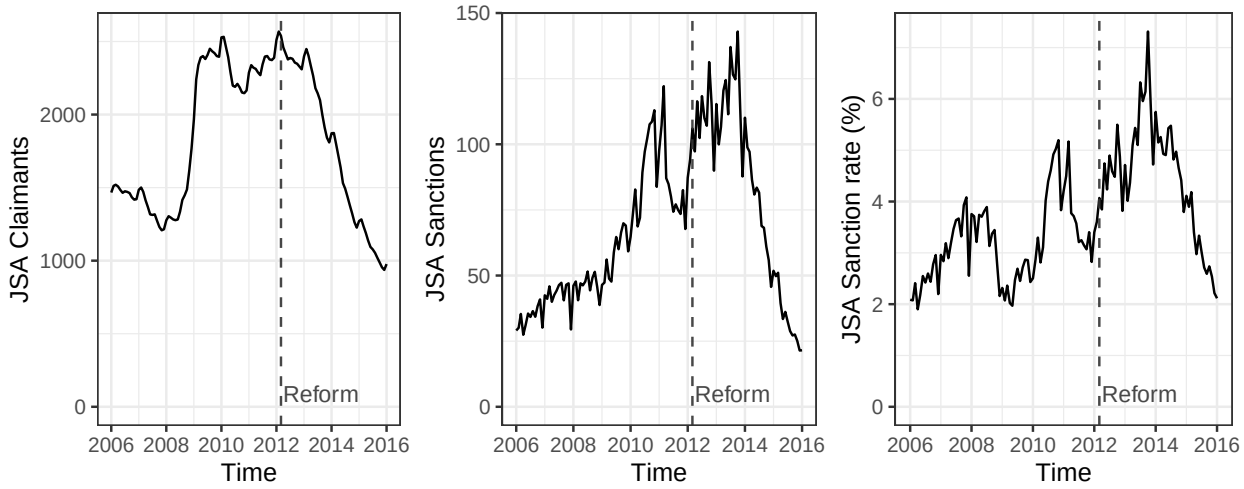
The context of our investigation is the UK 2010 parliamentary election and the 2012 welfare reform. This election is particularly noteworthy as it marked the end of the Labour era of government from 1997 until 2010 and elected the first coalition government since 1945. The Conservative-Liberal Democrat coalition government introduced a national welfare reform, which was enacted in March 2012. The reform sought to significantly reduce public spending by restricting eligibility to benefits, reducing the financial value of benefits, and by increasing incentives to take up employment. The reform included changes to several benefits, including housing benefits, unemployment benefits, and child support, as well as a household benefit cap and a reduction in annual up-rating of value of benefits.

We focus particularly on unemployment benefits. Department for Work and Pensions (DWP) is a government department responsible for welfare policy and it administers unemployment benefits through Jobcentre Plus. Jobseeker's allowance (JSA) is an unemployment benefit for claimants who are not in full time employment and are actively seeking for work. Claimants have to fill in a Jobseeker's Agreement and go to a Job Centre every two weeks to certify that they are still seeking work. Between 2010–2015, JSA payments constituted about £4.4bn annually, or about 3 % of UK government benefit expenditure in Great Britain.

Table 3.1: Sanction policy changes following 2012 reform

Infraction Level	**Example Reasons**	**Old Sanction**	**New Sanction**
Lower	Failure to attend advisor meeting Failure to attend work program	1 week	4 weeks, 13 weeks
Intermediate	Unavailable to work Ineligible search effort	No Sanction	4 weeks, 13 weeks
Higher	Refusing, voluntarily leaving work Dismissal for misconduct	1-26 weeks	13 weeks, 26 weeks, 156 weeks

Figure 3.2: Number of Jobseeker's Allowance (JSA) claimants and sanctions



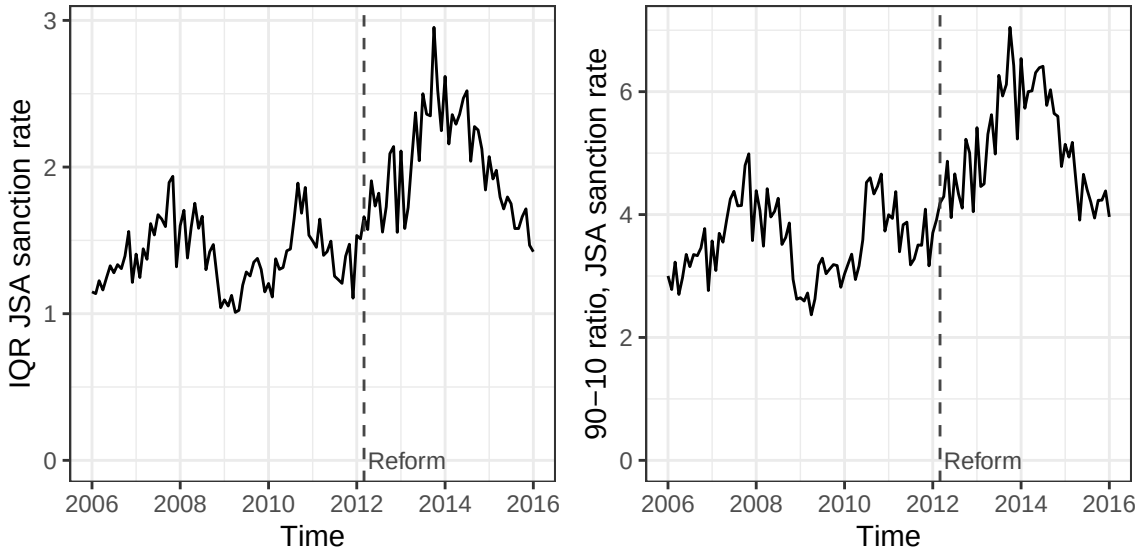
Note: Monthly averages across parliamentary constituencies in England, Scotland and Wales. Vertical dashed lines indicate the enactment of the Welfare Reform Act in March 2012.

An unemployment benefit sanction means a loss of the benefit for a duration which depends on the offence. The welfare reform led to a new sanctioning regime for the JSA from 22 October 2012, which altered both the intensive and extensive margin of sanctions. The main changes are outlined in Table 3.1. The new sanction rules include three categories of sanctions, and the length of the sanction in a given level depends on the number of previous sanctions in the past year. Previously the actual sanction period was at the discretion of the Adjudication Officer making the decision. Figure 3.2 plots the average number of JSA claimants, sanctions, and sanction rate over time. Although the number of claimants remains fairly stable during the election term, the rate of sanctions increases substantially post-reform.

The reform also introduced a new benefit called Universal Credit, which will replace most of the means-tested working-age benefits, including Jobseeker's Allowance. It was first introduced in 2013 in four pilot local authorities for new claimants, but the subsequent roll-out has been slow.[2] Some of the decline in number of JSA claimants and sanctions in 2015

[2]By the end of 2018 claiming Universal Credit was possible in all jobcentres in Great Britain, and the DWP expects that all households claiming the so-called legacy benefits will be transitioned to Universal Credit by the end of 2024 (House of Commons Library, 2023). Figure C.4 in Appendix 3.3. illustrates the roll-out.

Figure 3.3: Dispersion in JSA sanction rates



Note: Interquartile range (left-side panel) is computed as the $p75-p25$, by month. Similarly, for the $p90-p10$ ratio (right-side panel). The vertical dotted lines indicate the enactment of the Welfare Reform Act.

is explained by new claims being moved to Universal Credit.

The reforms to sanctioning policy announced in March 2012 altered both the intensive and extensive margin of sanctions. Most notably, we see that dispersion of sanction rates across localities increases substantially post-reform, while dispersion across localities remained fairly stable in the years before the reform. Even the events of the Global Financial Crisis/Great Recession did not alter variance in sanction rates qualitatively, while it is only the 2012 reforms which trigger large growth in sanction intensity-inequality. Figure 3.3 presents measures of dispersion in sanction rates, the interquartile range, and the range between 90th and 10th percentiles. Our analysis quantifies the political economy of this increase in sanction rate dispersion.

3.3.2. Parliamentary Elections

We use data on the 2010 Westminster general elections in England, Scotland and Wales. The elections are conducted using first-past-the-post (FPTP) voting in 632 single

Table 3.2: UK 2010 House of commons elections results for England, Scotland and Wales

Party	Vote share	Seats	Runner-up	Candidates
Conservative Party	36.89	306	190	631
Labour Party	29.66	258	159	631
Liberal Democrats	23.56	57	242	631
Scottish National Party	1.69	6	29	59
Plaid Cymru	0.57	3	6	40
Green Party	0.97	1	0	331
Other	6.65	1	6	1093

Seat obtained by "Other" refers to the Speaker.

member constituencies.[3] The Conservative Party (centre-right), Labour party (centre-left) and Liberal Democrats (centrist) are the three major political parties to field candidates in all seats we analyse.[4] Plaid Cymru and the Scottish National Party are both centre-left in stance and the nationalist parties of Wales and Scotland respectively, fielding candidates only in certain seats.

All members of parliament are elected simultaneously for a five-year term. The 2010 election resulted in a significant swing for the Conservative Party and ended the Labour-era of government. The Conservative party formed a coalition government with the third largest party Liberal Democrats. The election results are presented in Table 3.2. The Conservative Party won the majority of seats in England, while Labour won the majority in Scotland and Wales.

3.3.3. Data

The data on JSA claimants and sanctions comes from the Department for Work and Pensions, with the monthly number of claimants provided by Nomis. For population data, we use the 2009 mid-year parliamentary constituency population estimates from the Office for National Statistics and from the National Records of Scotland. Information on economic activity comes from the 2009 Annual Population Survey, and data on income comes from

[3]There are further 18 seats elected from Northern Ireland.
[4]Distributions of the three largest parties' vote shares are presented in Figure C.5.

Table 3.3: Summary statistics for constituencies won by coalition parties or Labour

	Coalition			Labour			
	N	Mean	SD	N	Mean	SD	Difference
JSA saction rate, %, post-refrom	363	4.36	1.00	258	4.73	0.99	-0.36
JSA sanctions	363	59.65	31.33	258	122.88	47.20	-63.23
JSA claimants	363	1438.84	669.32	258	2760.60	984.05	-1321.77
Conservative vote share	363	45.15	9.89	258	22.86	9.03	22.29
Libdem vote share	363	26.69	11.10	258	18.67	7.11	8.02
Labour vote share	363	20.17	10.30	258	46.47	7.73	-26.30
Flipped seats	363	0.26	0.44	258	0.02	0.14	0.24
MPs standing down	363	0.20	0.40	258	0.21	0.41	-0.01
Number of parties	363	5.42	0.69	258	5.40	0.68	0.02
Population	363	96053.43	10837.25	258	95860.94	13233.66	192.49
Female population, %	363	51.01	0.71	258	50.96	0.89	0.06
Working age population, %	363	63.89	3.23	258	66.04	3.43	-2.15
Economic activity rate, %	363	79.01	4.27	258	73.56	5.23	5.45
Employment rate, %	363	74.02	4.94	258	66.31	6.09	7.71
Unemployment rate, %	187	7.90	2.23	240	10.27	3.10	-2.37
Median earnings	324	22451.23	3889.92	244	20699.91	3321.38	1751.32

Summary statistics for UK parliamentary constituencies in England, Scotland and Wales. Coalition refers to constituencies won by Conservative Party or Liberal Democrats. JSA statistics are monthly averages across constituencies from January 2010 to December 2015. Post-reform JSA sanction rate refers to the period from March 2012 to December 2015. Flipped seats is share of seats where party control changed in the 2010 election. MPs standing down is share of seats where the MP did not seek re-election in 2010. Earnings is gross annual pay.

the 2009 Annual Survey of Hours and Earnings, both provided by the Office for National Statistics.

Table 3.3 presents summary statistics for constituencies won by either of the government parties or by the Labour Party. Most of the differences between the Coalition-aligned and non-aligned constituencies are relatively small. The Coalition-aligned constituencies have on average higher employment rates, earnings, and less JSA claimants.[5]

3.3.4. Competitive Election Sample Selection

We limit our analysis primarily to contests between coalition partners Conservative and Liberal Democrats versus Labour, that is, where one of the coalition parties came first and Labour came second, or with Labour first and a coalition party second. We exclude cases such as Conservatives winning followed by Liberal Democrats and Labour in third

[5]Summary statistics for all parliamentary constituencies are presented in the Appendix Table C.1.

place. Note, this selection does not necessarily exclude seats in Wales and Scotland to the extent the UK-wide parties occupy the first and second places.

In the 2010 general election constituency winners in England were only from the Conservative, Labour, Liberal Democrat, or Green Party. In addition, Scottish National Party won 6 out of the 59 seats in Scotland, and Plaid Cymru won 3 out of 40 seats in Wales. The governing coalition was formed by Conservatives and Liberal Democrats.

3.4. Empirical Strategy

Our empirical strategy centres on a regression discontinuity design, in which we compare constituencies where central-government-aligned parties narrowly won or were defeated. Let $Y_i(1)$ denote the potential outcome in case of treatment, i.e., the sanction rate in constituency i if a coalition party won the seat, and let $Y_i(0)$ denote the potential outcome in case of no treatment. We denote the treatment status, i.e., a coalition party winning the seat, as $D_i = 1(m_i \geq c)$, where m_i is the running variable and c is the election cut-off. We model treated and untreated potential outcomes as functions of the running variable m_i and the treatment status: $Y_i(0) = \alpha + f(m_i)$ and $Y_i(1) = Y_i(0) + \beta D_i$.

The key identifying assumption in this analysis is continuity of potential outcomes at the threshold—that absent treatment, districts immediately to the left and right of the cut-off would have had identical outcomes—and that being immediately on either side of the cut-off is as good as random (Hahn et al., 2001). The parameter of interest β^{RD} is then given by

$$\beta^{RD} = \lim_{m \to c^+} E\big[Y_i(1); m\big] - \lim_{m \to c^-} E\big[Y_i(0); m\big] \tag{3.1}$$

We determine the running variable as the Coalition's distance to victory in head-to-head races with Labour, at the constituency-level, i.e., vote share of strongest coalition party

minus Labour, and the cut-off is $c = 0$.

$$m_i = \begin{cases} \text{Conservative}_i - \text{Labour}_i & \text{if } 1^{st}/2^{nd} \text{ contested by Conservatives and Labour} \\ \text{Liberal Democrat}_i - \text{Labour}_i & \text{if } 1^{st}/2^{nd} \text{ contested by Liberal Democrats and Labour} \end{cases} \tag{3.2}$$

Hence a Labour-held seat would be represented by $m_i < 0$, while a seat held by one of the coalition parties would be represented by $m_i \geq 0$. We estimate the following equation, allowing for a vector of district- and regional-level controls:

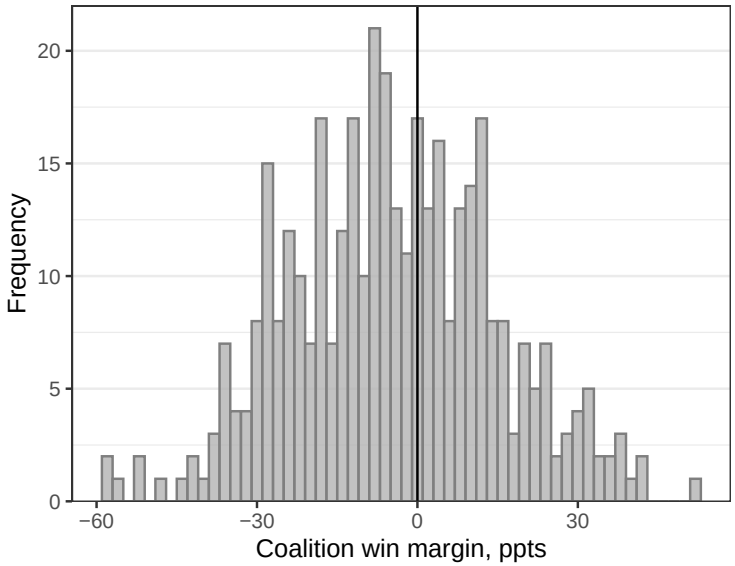
$$Y_i = \alpha + \beta^{RD} D_i + f(m_i) + X_i \Gamma + \varepsilon_i \tag{3.3}$$

where D_i is a dummy for a Coalition seat and and $f(m_i)$ is a polynomial of the Coalition win margin in constituency i, estimated separately on each side of the cut-off. X_i is a set of control variables, which includes log population, share of women, share of working age population, median earnings, and employment rate. To avoid including bad controls, we use population characteristics from 2009. The identification does not rely on conditioning on observables other than the running variable, and the additional covariates are included only to improve precision of the estimator. The causal parameter of interest is β^{RD} which captures the discontinuous effect of switching from a Coalition-held to labour-held seat. As advised by recent literature, we conduct estimation with the local polynomial approach, and we use the Calonico et al. (2014) approach for optimal bandwidth selection.

3.4.1. Validity of the RDD

The identification relies on the potential outcomes evolving smoothly at the cut-off. We examine the identifying assumption in several ways. We evaluate formally the continuity of the density of the running variable, evaluate discontinuities in pre-treatment covariates, examine sensitivity to bandwidth selection, and finally conclude with placebo outcomes and

Figure 3.4: Density of running variable, coalition vote margin to victory



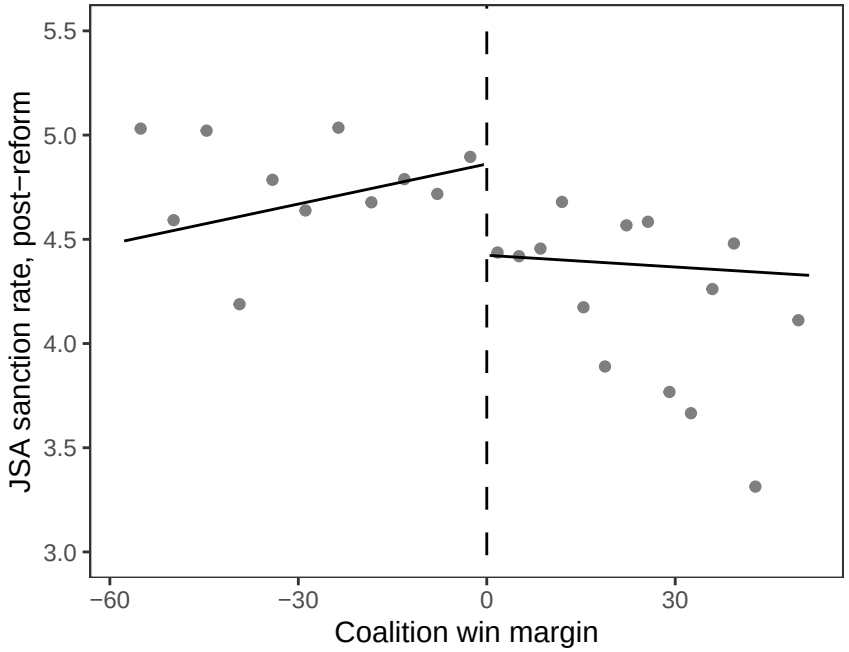
Note: Margin to victory is calculated as vote share difference between one of the coalition parties and the Labour party in elections contested by Conservative or Liberal Democratic Party and the Labour Party.

altering the threshold to placebo levels other than zero.

Running Variable Density Continuity We evaluate the smoothness of the density function around the cut-off informally by visual inspection and a formal McCrary-test of a discontinuity in density around the cut-off. Figure 3.4 presents the density of the running variable and Figure C.1 in Appendix 3.2. presents the McCrary-test (McCrary, 2008). Furthermore, we conduct manipulation testing using local polynomial density estimation as proposed by Cattaneo et al. (2020) (Figure C.2 in Appendix 3.2.). Testing does not reject continuity of density around the $c = 0$ threshold. We conclude that smoothness is satisfied locally.

Pre-Treatment Covariate Balance Figure C.3 in Appendix 3.2. shows that the pre-treatment covariates are smooth across the electoral threshold. The only exception to good balance is a marginally significant effect on employment rate. Although there are no corresponding effects on unemployment rate or economic activity rate, to ensure that there is in fact no sorting, we conduct additional balance tests on employment rates. Since the employment data comes from the labour force survey, which is collected on a quarterly

Figure 3.5: Effect of Coalition win on JSA sanction rate



Note: The chart presents binned averages of JSA sanction rate in the post-reform period from March 2012 to December 2015 and linear fit lines from a global polynomial RD specification with demographic and socioeconomic controls.

basis, we can examine employment in alternative 12 month windows. We find no evidence of imbalance in employment, unemployment, or economic activity rates measured in slightly different windows.[6]

3.5. Results

Graphical evidence for our main result is presented in Figure (3.5). The figure presents unemployment benefit sanction rate as a function of the Coalition's winning margin with a linear fit on each side of the electoral threshold. Although there is considerable dispersion in the tails, the figure shows a noticeable drop in the sanction rate close to the cut-off for constituencies won by one of the coalition parties.[7]

[6]The RD estimates are reported in Tables C.2 and Table C.3 in Appendix 3.2.
[7]Figure C.6 in Appendix 3.3. shows the corresponding RD plot with a fourth order polynomial fit.

Table 3.4: RD estimates of Coalition win on JSA sanction rate

	Linear			Quadratic		
	(1)	(2)	(3)	(4)	(5)	(6)
Coalition win	-0.657	-0.800**	-0.913**	-0.765*	-0.849**	-0.955**
	(0.410)	(0.345)	(0.443)	(0.462)	(0.378)	(0.486)
p-value robust	0.102	0.025	0.053	0.099	0.03	0.077
95 % CI robust	[-1.718, 0.155]	[-1.682, -0.113]	[-1.936, 0.01]	[-1.888, 0.163]	[-1.748, -0.089]	[-2.008, 0.103]
N	172	171	81	253	263	159
Bandwidth	12.26	12.8	6.4	20.4	24.12	12.06
Controls		✓	✓		✓	✓

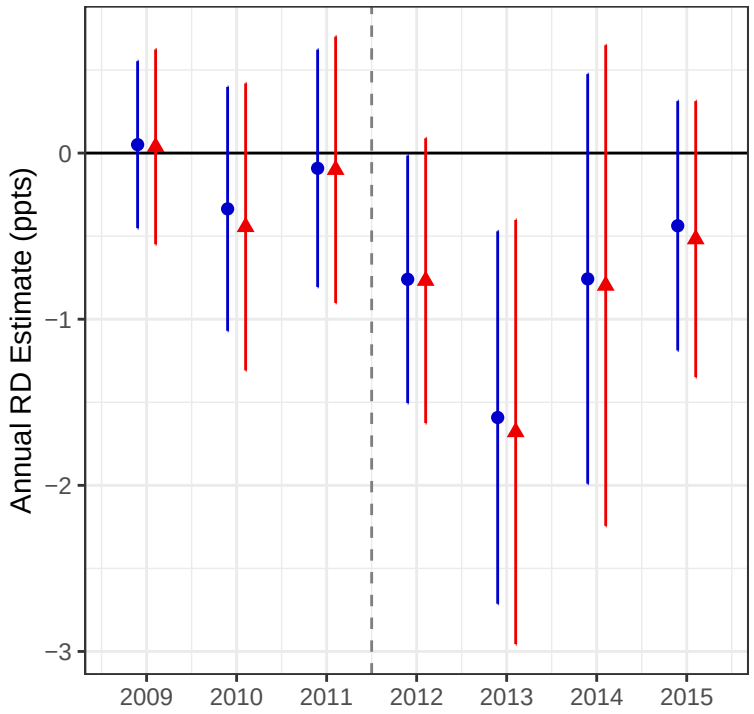
*p<0.1; **p<0.05; ***p<0.01. Robust standard errors in parentheses. The dependent variable is JSA sanction rate in the post-reform period from March 2012 to December 2015. Estimates in columns (1)-(3) are from local linear and estimates in column (4)-(6) from quadratic regressions. Estimates in column (1)-(2) and (4)-(5) are from specifications using the optimal Calonico et al. (2014) bandwidths, and estimates in columns (3) and (6) are calculated with half of the optimal bandwidths. In all regressions a triangular kernel is used. Controls include log population, share of women, share of working age, median earnings, and employment rate.

The RD estimates are presented in Table 3.4. We report estimates from local linear and quadratic specifications using the optimal bandwidth proposed by Calonico et al. (2014) as well as half of the optimal bandwidth. We also report the robust bias-corrected p-values and 95 % confidence intervals. The RD estimates indicate a jump of 0.8 percentage points at the cut-off, on a baseline rate of 4.5 %. This implies on average 18 % lower sanction rate in Coalition controlled constituencies than in Labour controlled constituencies. The estimates are robust to different polynomial specifications and a smaller bandwidth.

Estimates by Year Economic behaviour of households may also change discontinuously at the election threshold—one concern is that workers and jobseekers internalise that they live in a Coalition-held seat, and act accordingly. For example, they may expect that under a Conservative MP, if there is any influence on local policy-making, Conservative-influenced institutions would be more severe, and so they change job-search and labour supply decisions.

If we assume household responses to local political control do not change over time, we can account for time-invariant characteristics which may also jump at the cut-off by estimating the RD regression separately by year. We exploit the change in national sanctions policy in 2012, two years after elections, to disentangle asymmetric reform implementation in coalition-aligned seats versus changes in jobseeker behaviours. Such behavioural discon-

Figure 3.6: Difference in discontinuities. Dependent variable: JSA sanction rate. Running variable: Coalition win margin



Note: The chart presents annual RD estimates for the effect of Coalition alignment on average annual sanction rate. Each dot represents a separate RD regression. Demographic and socioeconomic controls included. Vertical bars represent 95 % confidence intervals. Dashed vertical line splits the years into pre- and post-reform periods. Blue dots and red triangles represent linear and quadratic polynomial fits respectively

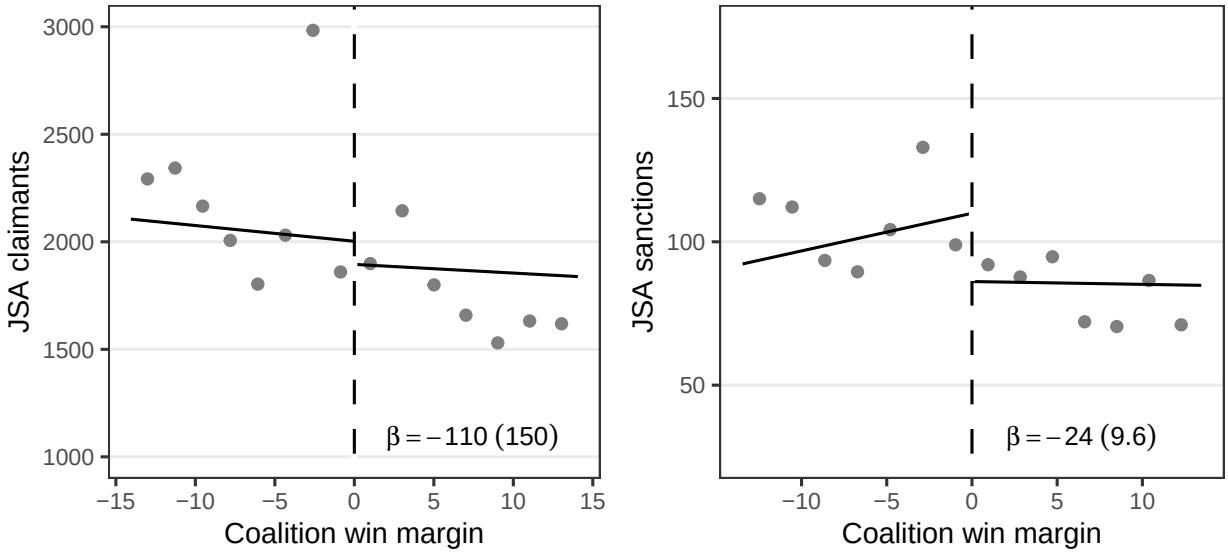
tinuities should already appear in 2010 and 2011 data, while policy discontinuities are only activated with reforms in 2012.[8]

Decomposing our main result by year, we find insignificant discontinuities in years 2010 and 2011, before the national sanctioning reform, while RD estimates become statistically significant only in 2012 onward (Figure 3.6).[9] As a placebo test, we also test for effects in 2009, i.e., one year prior to the election, and show that Coalition win in 2010 had no effect on the placebo outcome. Furthermore, examining separately the number of claimants and number of sanctions shows that the effect on sanction rates is indeed coming

[8]Cf. the difference-in-discontinuities estimator employed by Grembi et al. (2016) in the context of municipal fiscal rules with a sharp cut-off at 5,000 inhabitants per municipality.

[9]The estimates are also presented in Table C.4 in Appendix 3.4., and Figure C.7 in Appendix 3.3. shows the RD plots by year.

Figure 3.7: Effect of Coalition win on number of JSA claimants and sanctions

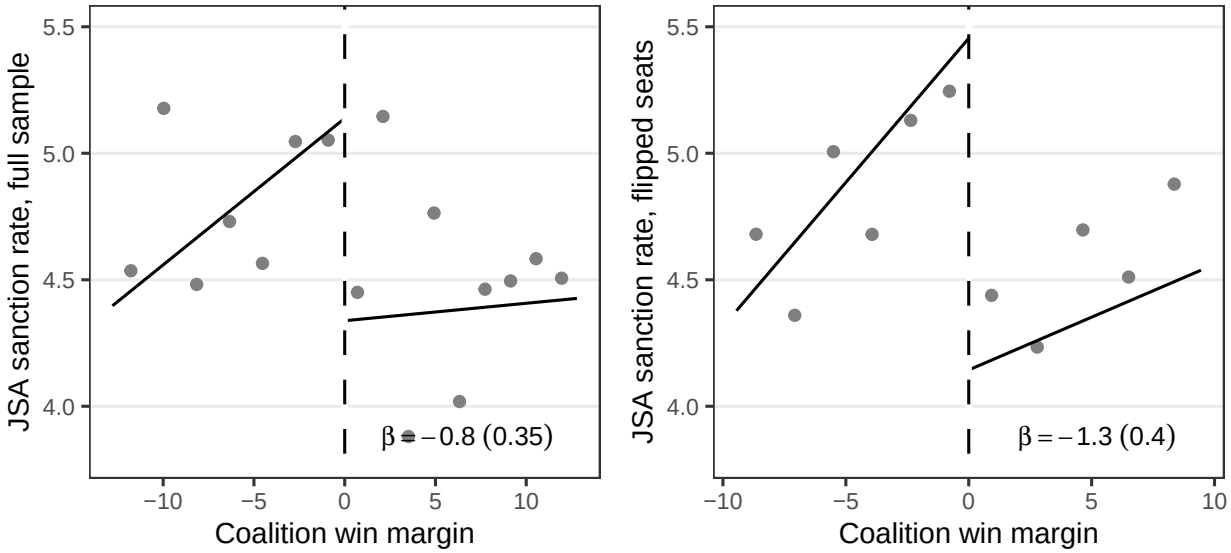


Note: The figures present binned averages of number of JSA claimants and JSA sanctions in the post-reform period from March 2012 to December 2015 and fit lines from a linear RD specification with demographic and socioeconomic controls. β is the RD estimate. Robust standard errors in parentheses.

from fewer sanctions being imposed, while the number of claimants is not affected (Figure 3.7). The results therefore show that the implementation of the harsher sanctioning regime differs significantly between seats closely won by one of the coalition parties or the Labour Party. In particular, the implementation is significantly more lenient in constituencies won by the Coalition.

Our interpretation is that the government-aligned MPs were able to influence the local implementation of the new, harsher sanctioning regime, leading to an uneven allocation of sanctions that favoured their constituencies. Since close elections take place in competitive constituencies, it is likely that the effect is driven by electoral incentives. There is anecdotal evidence that Job Centre staff were given sanction targets and made claiming benefits more difficult on purpose (Wintour, 2013), which supports our interpretation that effect is due to MPs exerting influence on public employees in the social welfare administration. There was also a large volume of negative media coverage of sanctions relating to salient cases of jobseeker deaths following being sanctioned.

Figure 3.8: Full sample and flipped Labour to Coalition seats



Note: The chart presents binned averages of JSA sanction rate in the post-reform period from March 2012 to December 2015 and linear fit lines from a linear RD specification with demographic and socioeconomic controls. Left panel presents estimates from full sample and right panel using only seats won by Labour in 2005. β is the RD estimate. Robust standard errors in parentheses.

Flipped Seats One potential mechanism we test is whether sanction policy is more lenient in seats which flip from Labour to Coalition control in the 2010 election. Figure 3.8 presents RD estimates for the full sample and for seats held by Labour in 2005. We find significantly stronger estimates for the newly gained seats, with effect size about 50 % larger than when using the full sample. This finding is consistent with the interpretation that more lenient implementation of the sanction regime is motivated by an attempt to solidify voter support in the previously Labour-held constituencies.

Alternative Head-to-Head Races To better understand the mechanism, we test whether the effect on sanctioning policy varies between the coalition parties or depending on the runner-up party. Figure 3.9 presents RD estimates from different head-to-head electoral races with the running variable modified accordingly. The upper left panel shows the baseline estimate of Coalition win against Labour. Including races between the Coalition and any other opposition party has negligible influence on the estimate. Instead, the results

show that the negative effect on the sanction rate is mostly driven by constituencies with close races between Conservative and Labour. The point estimate of Liberal Democrat win against Labour also suggests a negative effect on sanctions, but the estimate is imprecise due to low number of close races.[10]

In sum, the findings show that close electoral races especially between the two main parties contesting UK elections—Conservative and Labour—result in unequal implementation of the welfare reforms, while including close races involving the coalition partner Liberal Democrats or other opposition parties attenuates the effect. The results are therefore consistent with the interpretation that the distortion is motivated by electoral concerns, and that Conservative Party was most effective at influencing the sanction policy implementation.

3.6. Robustness

Sensitivity to Bandwidth Choice Employing local linear non-parametric regression (Hahn et al., 2001), estimates may be sensitive to the choice of bandwidth, h, employed in determining how to weight observations based on their distance from the cut-off. For example, on the positive side of the threshold, outcome y^+ would be modelled as:

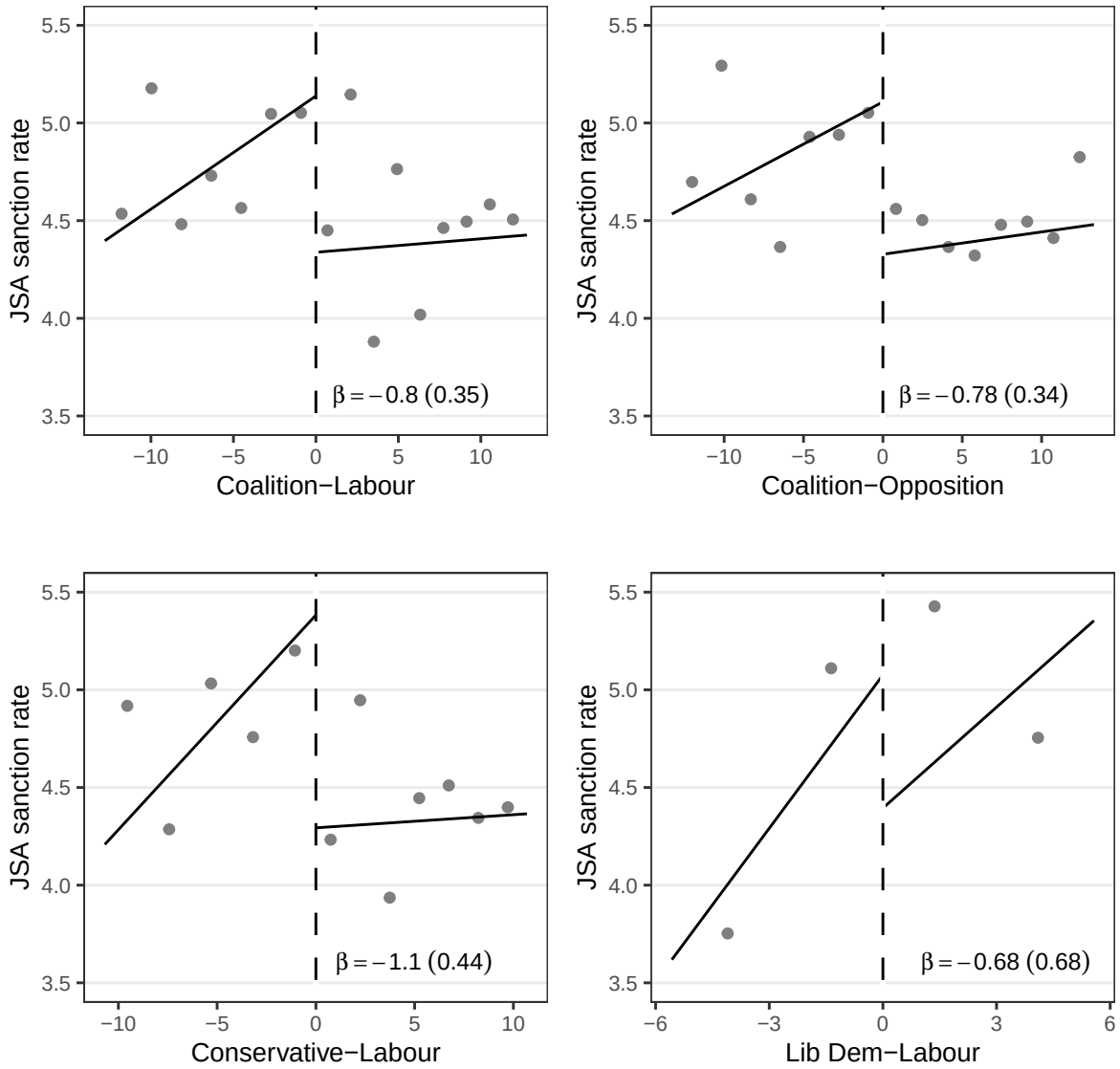
$$\hat{y}^+ = \arg\min_{a,b} \sum_i \left(Y_i - a - b(m_i - c)\right)^2 K\left(\frac{m_i - c}{h}\right) 1(m_i > c) \tag{3.4}$$

We examine various alternative bandwidths, centred on the optimal choice as determined by the methodology of Calonico et al. (2014).

Figure 3.10 presents RD estimates using a range of different bandwidths for the estimator. The estimate remains stable and statistically significant for a wide range of estimation windows. As the bandwidth narrows and the sample size decreases, the estimates become somewhat less precise.

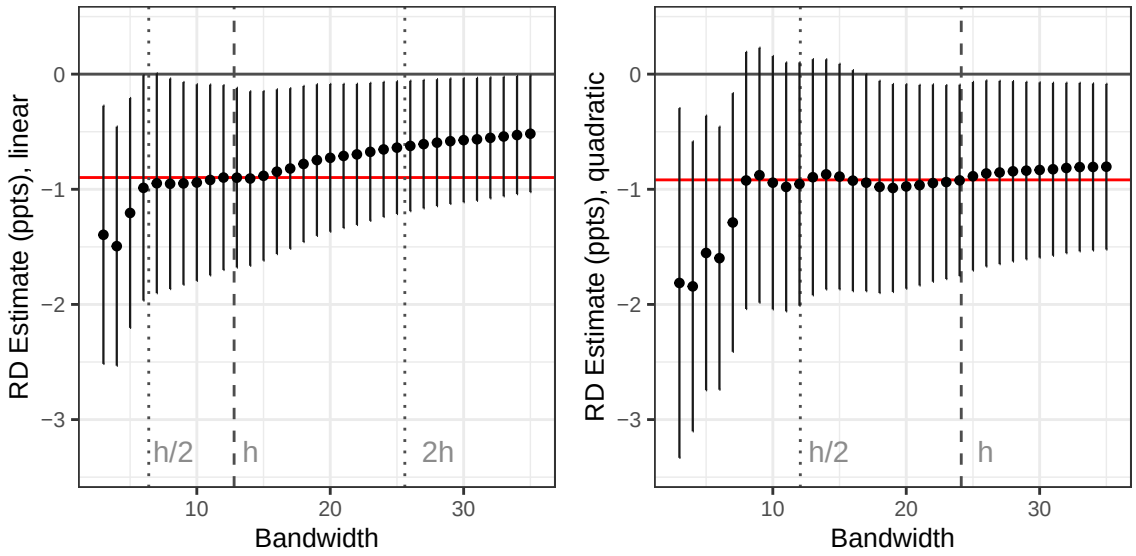
[10]The estimates are also presented in Table C.5 in Appendix 3.4.

Figure 3.9: Effect of Coalition, Conservative, or Liberal Democrat win on JSA sanction rate



Note: The figure presents binned averages of JSA sanction rate in the post-reform period from March 2012 to December 2015 and fit lines from a linear RD specification with demographic and socioeconomic controls within the optimal Calonico et al. (2014) bandwidths. Running variable in the upper left panel is Coalition's win margin against Labour Party, in the upper right panel Coalition's win margin against any opposition party, in the lower left panel Conservative's win margin against Labour, and in the lower right panel Liberal Democrat's win margin against Labour. β is the RD estimate. Robust standard errors in parentheses.

Figure 3.10: Regression discontinuity robustness: bandwidth sensitivity for linear and quadratic polynomials



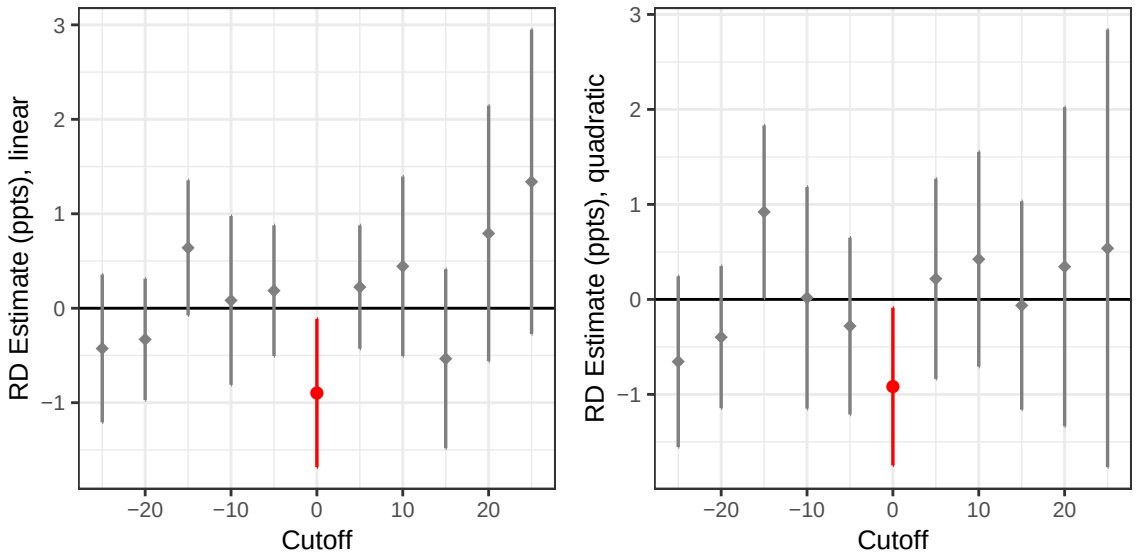
Note: The chart presents RD estimates for the effect of Coalition alignment on JSA sanction rate. Each panel reports repeated RD regressions with linear (left) or quadratic (right) fits, with demographic and socioeconomic controls and a triangular kernel, adjusting only the bandwidth used to fit polynomials. Vertical bars represent 95 % robust bias-corrected confidence intervals. Horizontal lines represent estimate at optimal Calonico et al. (2014) bandwidth, h, as well as $h/2$ and $2h$. RD regressions maintain constant h/b ratio between bandwidth for the RD estimator and bias correction. Red horizontal lines represent the bias-corrected baseline estimate.

Placebo Cut-Offs To examine the robustness of our main result we also employ placebo cut-offs at the left and right of the true discontinuity: $\{c \pm 5, \pm 10, ..., \pm 25\}$, for linear and quadratic polynomials. Overall, baseline results appear to be robust—cutting the running variable at arbitrary thresholds elsewhere on the support does not generate estimates which are statistically different from zero (Figure 3.11). However, there is a fair degree of variability in the placebo point estimates, especially in the case of a linear fit, possibly due to errors in model fit being particularly bad in areas where a linear fit is a bad approximation.

3.7. Conclusions

This paper studies the impact of political alignment on local implementation of national welfare policy. In particular, we examine how political control influences the practical

Figure 3.11: Regression discontinuity robustness: placebo cut-offs



Note: Each panel reports repeated RD regressions with linear (left) or quadratic (right) fits, adjusting the discontinuity to the placebo cut-off. Placebos are presented in grey diamonds, while baseline estimates are presented as red circles. Vertical bars represent 95 % robust bias-corrected confidence intervals.

implementation of a new unemployment benefit sanctioning regime. We employ regression discontinuity design to exploit exogenous variation in having a government-aligned MP on local economic policy institutions. Our identification strategy solves the endogeneity problem whereby areas leaning more towards or against the central government are endogenous to local characteristics—different places vote for different parties.

The welfare reform introduced by the Conservative-led government implied stricter monitoring of welfare recipients and a harsher sanctioning regime. However, our results show that its implementation is significantly more lenient in the Coalition-held constituencies. We find that constituencies with a marginally aligned MP have unemployment benefit sanction rates which are on average 18 % lower than marginally unaligned areas in the post-reform years.

Legislators have an electoral incentive to provide a more favourable distribution of public spending and spending cuts to their constituencies. The mechanism we suggest is that government-aligned legislators are able exert more influence over public employees, thereby

resulting in an uneven allocation of punitive welfare measures. Although our results do not constitute proof of this exact mechanism, they do show that party control has a systematic effect on local sanctioning policy. Such partisan influence on the availability of welfare benefits has direct welfare consequences for affected jobseekers.

Bibliography

Abou-Chadi, T., & Krause, W. (2020). The Causal Effect of Radical Right Success on Mainstream Parties' Policy Positions: A Regression Discontinuity Approach. *British Journal of Political Science*, *50*(3), 829–847.

Abou-Chadi, T., & Stoetzer, L. F. (2020). How Parties React to Voter Transitions. *American Political Science Review*, *114*(3), 940–945.

ACLED. (2019a). *Armed Conflict Location & Event Data Project (ACLED)*. https://doi.org/https://doi.org/10.1177/0022343310378914

ACLED. (2019b). Armed Conflict Location & Event Data Project (ACLED) Codebook, 2019.

Adams, J., Clark, M., Ezrow, L., & Glasgow, G. (2004). Understanding Change and Stability in Party Ideologies: Do Parties Respond to Public Opinion or to Past Election Results? *British Journal of Political Science*, *34*(4), 589–610.

Adams, J., Clark, M., Ezrow, L., & Glasgow, G. (2006). Are Niche Parties Fundamentally Different from Mainstream Parties? The Causes and the Electoral Consequences of Western European Parties' Policy Shifts, 1976–1998. *American Journal of Political Science*, *50*(3), 513–529.

Adena, M., Enikolopov, R., Petrova, M., Santarosa, V., & Zhuravskaya, E. (2015). Radio and the Rise of the Nazis in Prewar Germany. *The Quarterly Journal of Economics*, *130*(4), 1885–1939.

Akhtari, M., Moreira, D., & Trucco, L. (2022). Political Turnover, Bureaucratic Turnover, and the Quality of Public Services. *American Economic Review*, *112*(2), 442–493.

Albouy, D. (2013). Partisan Representation in Congress and the Geographic Distribution of Federal Funds. *Review of Economics and Statistics*, *95*(1), 127–141.

Alesina, A., Carloni, D., & Lecce, G. (2012). The Electoral Consequences of Large Fiscal Adjustments. In *Fiscal policy after the financial crisis* (pp. 531–570). University of Chicago Press.

Algan, Y., Guriev, S., Papaioannou, E., & Passari, E. (2017). The European Trust Crisis and the Rise of Populism. *Brookings Papers on Economic Activity*, *2017*(2), 309–400.

Allport, G. (1954). *The Nature of Prejudice*. Addison-Wesley Publishing Company.

Ansolabehere, S., Gerber, A., & Snyder, J. (2002). Equal Votes, Equal Money: Court-Ordered Redistricting and Public Expenditures in the American States. *American Political Science Review*, *96*(4), 767–777.

Ansolabehere, S., Snyder, J. M., & Stewart, C. (2001). Candidate positioning in U.S. House elections. *American Journal of Political Science*, 136–159.

Armand, A., Atwell, P., & Gomes, J. F. (2020). The Reach of Radio: Ending Civil Conflict Through Rebel Demobilization. *American Economic Review*, *110*(5), 1395–1429.

Bach, T., & Veit, S. (2018). The Determinants of Promotion to High Public Office in Germany: Partisan Loyalty, Political Craft, or Managerial Competencies? *Journal of Public Administration Research and Theory*, *28*(2), 254–269.

Bakker, R., De Vries, C., Edwards, E., Hooghe, L., Jolly, S., Marks, G., Polk, J., Rovny, J., Steenbergen, M., & Vachudova, M. A. (2015). Measuring Party Positions in Europe: The Chapel Hill Expert Survey Trend File, 1999–2010. *Party Politics*, *21*(1), 143–152.

Banful, A. B. (2011). Do Formula-Based Intergovernmental Transfer Mechanisms Eliminate Politically Motivated Targeting? Evidence from Ghana. *Journal of Development Economics*, *96*(2), 380–390.

Bansak, K., Bechtel, M. M., & Margalit, Y. (2021). Why Austerity? The Mass Politics of a Contested Policy. *American Political Science Review*, *115*(2), 486–505.

Baron, D. P., & Ferejohn, J. A. (1989). Bargaining in Legislatures. *American Political Science Review*, *83*(4), 1181–1206.

Benoit, K., & Laver, M. (2012). The Dimensionality of Political Space: Epistemological and Methodological Considerations. *European Union Politics*, *13*(2), 194–218.

Besley, T., & Ghatak, M. (2005). Competition and Incentives with Motivated Agents. *American Economic Review*, *95*(3), 616–636.

Bhalotra, S., Clots-Figueras, I., Cassan, G., & Iyer, L. (2014). Religion, Politician Identity and Development Outcomes: Evidence from India. *Journal of Economic Behavior & Organization*, *104*, 4–17.

Borg, S. (2018). *Kuntavaalitutkimus 2017* (Tutkimusjulkaisu No. 108). Kunnallisalan kehittämissäätiö.

Brassiolo, P., Estrada, R., & Fajardo, G. (2020). My (Running) Mate, the Mayor: Political Ties and Access to Public Sector Jobs in Ecuador. *Journal of Public Economics*, *191*, 104286.

Brender, A., & Drazen, A. (2008). How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries. *American Economic Review*, *98*(5), 2203–2220.

Budge, I., Klingemann, H.-D., Volkens, A., Bara, J., Tanenbaum, E., et al. (2001). *Mapping Policy Preferences: Estimates for Parties, Electors, and Governments, 1945-1998* (Vol. 1). Oxford University Press on Demand.

Bursztyn, L., & Cantoni, D. (2016). A Tear in the Iron Curtain: The Impact of Western Television on Consumption Behavior. *Review of Economics and Statistics*, *98*(1), 25–41.

Bursztyn, L., Egorov, G., Enikolopov, R., & Petrova, M. (2019). *Social Media and Xenophobia: Evidence from Russia* (No. w26567). National Bureau of Economic Research.

Bursztyn, L., Egorov, G., & Fiorin, S. (2020). From Extreme to Mainstream: The Erosion of Social Norms. *American Economic Review*, *110*(11), 3522–48.

Calonico, S., Cattaneo, M. D., & Titiunik, R. (2014). Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs. *Econometrica*, *82*(6), 2295–2326.

Cameron, A. C., Gelbach, J. B., & Miller, D. L. (2008). Bootstrap-based Improvements for Inference with Clustered Errors. *The Review of Economics and Statistics*, *90*(3), 414–427.

Carozzi, F., & Repetto, L. (2016). Sending the Pork Home: Birth Town Bias in Transfers to Italian Municipalities. *Journal of Public Economics*, *134*, 42–52.

Cattaneo, M. D., Jansson, M., & Ma, X. (2020). Simple Local Polynomial Density Estimators. *Journal of the American Statistical Association*, *115*(531), 1449–1455.

Christensen, D., Nguyen, M., & Sexton, R. (2019). Strategic Violence during Democratization: Evidence from Myanmar. *World Politics*, *71*(2), 332–366.

Christensen, J. G., Klemmensen, R., & Opstrup, N. (2014). Politicization and the Replacement of Top Civil Servants in Denmark. *Governance*, *27*(2), 215–241.

Clots-Figueras, I. (2011). Women in Politics: Evidence from the Indian States. *Journal of Public Economics*, *95*(7-8), 664–690.

Colantone, I., & Stanig, P. (2018). The Trade Origins of Economic Nationalism: Import Competition and Voting Behavior in Western Europe. *American Journal of Political Science*, *62*(4), 936–953.

Colonnelli, E., Prem, M., & Teso, E. (2020). Patronage and Selection in Public Sector Organizations. *American Economic Review*, *110*(10), 3071–3099.

Cox, G. W., & McCubbins, M. D. (1986). Electoral Politics as a Redistributive Game. *The Journal of Politics*, *48*(2), 370–389.

Crabtree, C., & Kern, H. L. (2018). Using Electromagnetic Signal Propagation Models for Radio and Television Broadcasts: An Introduction. *Political Analysis*, *26*(3), 348–355.

Dafoe, A., & Lyall, J. (2015). Communication Technologies and Political Conflict: Insights from New Data, Designs, and Questions. *Journal of Peace Research*, *52*(3), 401–13.

Dahlberg, M., & Johansson, E. (2002). On the Vote-Purchasing Behavior of Incumbent Governments. *American Political Science Review*, *96*(1), 27–40.

Dahlström, C., & Holmgren, M. (2019). The Political Dynamics of Bureaucratic Turnover. *British Journal of Political Science*, *49*(3), 823–836.

DellaVigna, S., Enikolopov, R., Mironova, V., Petrova, M., & Zhuravskaya, E. (2014). Cross-Border Media and Nationalism: Evidence from Serbian Radio in Croatia. *American Economic Journal: Applied Economics*, *6*(3), 103–32.

DellaVigna, S., & Gentzkow, M. (2010). Persuasion: Empirical Evidence. *Annu. Rev. Econ.*, *2*(1), 643–669.

DeMars, C. (2002). Incomplete Data and Item Parameter Estimates under JMLE and MML Estimation. *Applied Measurement in Education*, *15*(1), 15–31.

Diamond, L. (2010). Liberation Technology. *Journal of Democracy*, *21*(3), 69–83.

Dixit, A., & Londregan, J. (1996). The Determinants of Success of Special Interests in Redistributive Politics. *the Journal of Politics*, *58*(4), 1132–1155.

Dragu, T., & Rodden, J. (2011). Representation and Redistribution in Federations. *Proceedings of the National Academy of Sciences*, *108*(21), 8601–8604.

Duflo, E., Glennerster, R., & Kremer, M. (2007). Using Randomization in Development Economics Research: A Toolkit. *Handbook of development economics*, *4*, 3895–3962.

Eisenach, J. A. (2015). The Economics of Zero Rating. *NERA Economic Consulting, March*.

Elvidge, C. D., Zhizhin, M., Ghosh, T., Hsu, F.-C., & Taneja, J. (2021). *Annual Time Series of Global VIIRS Nighttime Lights Derived from Monthly Averages: 2012 to 2019* (No. *5*). MDPI. https://doi.org/doi:10.3390/rs13050922

EMN. (2016). *Annual Report on Migration and Asylum Policy: Finland 2015*. European Migration Network (EMN).

Enikolopov, R., Makarin, A., & Petrova, M. (2020). Social Media and Protest Participation: Evidence from Russia. *Econometrica*, *88*(4), 1479–1514.

Enikolopov, R., Petrova, M., & Zhuravskaya, E. (2011). Media and Political Persuasion: Evidence from Russia. *American Economic Review*, *101*(7), 3253–85.

ESA. (2017). *Land Cover CCI Product User Guide Version 2*. maps.elie.ucl.ac.be/CCI/viewer/download/ESACCI-LC-Ph2-PUGv2_2.0.pdf

Event Data Project. (2012). CAMEO Conflict and Mediation Event Observations Event and Actor Codebook. https://www.gdeltproject.org/

Fajgelbaum, P. D., Goldberg, P. K., Kennedy, P. J., & Khandelwal, A. K. (2020). The Return to Protectionism. *The Quarterly Journal of Economics*, *135*(1), 1–55.

Fergusson, L., & Molina, C. (2021). *Facebook Causes Protests* (tech. rep.). Universidad de los Andes-CEDE.

Ferreira, F., & Gyourko, J. (2009). Do Political Parties Matter? Evidence from US Cities. *The Quarterly Journal of Economics*, *124*(1), 399–422.

Fetzer, T. (2019). Did Austerity Cause Brexit? *American Economic Review*, *109*(11), 3849–86.

Fiva, J. H., Folke, O., & Sørensen, R. J. (2018). The Power of Parties: Evidence from Close Municipal Elections in Norway. *The Scandinavian Journal of Economics*, *120*(1), 3–30.

Fiva, J. H., Geys, B., Heggedal, T.-R., & Sørensen, R. (2021). Political Alignment and Bureaucratic Pay. *Journal of Public Administration Research and Theory*, *31*(3), 596–615.

Folke, O. (2014). Shades of Brown and Green: Party Effects in Proportional Election Systems. *Journal of the European Economic Association*, *12*(5), 1361–1395.

Fortunato, D., Lin, N. C. N., Stevenson, R. T., & Tromborg, M. W. (2021). Attributing Policy Influence under Coalition Governance. *American Political Science Review*, *115*(1), 252–268.

Fouirnaies, A., & Mutlu-Eren, H. (2015). English Bacon: Copartisan Bias in Intergovernmental Grant Allocation in England. *The Journal of Politics*, *77*(3), 805–817.

Frantz, E., Kendall-Taylor, A., & Wright, J. (2020). Digital Repression in Autocracies. *V-Dem Institute at the University of Gothenburg*.

Freedom House. (2017). Freedom on the Net 2017: Myanmar. https://freedomhouse.org/country/myanmar/freedom-net/2017

Freier, R., & Odendahl, C. (2015). Do Parties Matter? Estimating the Effect of Political Power in Multi-Party Systems. *European Economic Review*, *80*, 310–328.

Funke, M., Schularick, M., & Trebesch, C. (2020). Populist Leaders and the Economy.

Gagliarducci, S., Nannicini, T., & Naticchioni, P. (2011). Electoral Rules and Politicians' Behavior: A Micro Test. *American Economic Journal: Economic Policy*, *3*(3), 144–174.

Gailmard, S., & Patty, J. W. (2012). Formal Models of Bureaucracy. *Annual Review of Political Science*, *15*, 353–377.

Gallo, N., & Lewis, D. E. (2012). The Consequences of Presidential Patronage for Federal Agency Performance. *Journal of Public Administration Research and Theory*, *22*(2), 219–243.

Garcia, C. N. (2018). UNOSAT analysis of destruction and other developments in Rakhine State, Myanmar Contents. https://www.ohchr.org/sites/default/files/Documents/HRBodies/HRCouncil/FFM-Myanmar/UNOSATReportMyanmar_20180912.pdf

GDELT Project. (2019). *Global Database of Events, Language, and Tone (GDELT)*. https://www.gdeltproject.org/

Gehring, K., & Schneider, S. A. (2018). Towards the Greater Good? EU Commissioners' Nationality and Budget Allocation in the European Union. *American Economic Journal: Economic Policy*, *10*(1), 214–239.

Gilmore, E., Gleditsch, N. P., Lujala, P., & Ketil Rod, J. (2005). Conflict Diamonds: A New Dataset. *Conflict Management and Peace Science*, *22*(3), 257–272.

Golden, M., & Min, B. (2013). Distributive Politics Around the World. *Annual Review of Political Science*, *16*, 73–99.

Grembi, V., Nannicini, T., & Troiano, U. (2016). Do Fiscal Rules Matter? *American Economic Journal: Applied Economics*, 1–30.

GSM Association. (2018). Taxing Mobile Connectivity in Asia Pacific: A Review of Mobile Sector Taxation and its Impact on Digital Inclusion.

Guiso, L., Herrera, H., Morelli, M., & Sonno, T. (2017). *Demand and Supply of Populism* (Working Paper n. 610).

Guriev, S., Melnikov, N., & Zhuravskaya, E. (2021). 3G Internet and Confidence in Government. *The Quarterly Journal of Economics*, *136*(4), 2533–2613.

Guriev, S., & Papaioannou, E. (2020). The Political Economy of Populism. *Journal of Economic Literature*, *60*(3), 753–832.

Hahn, J., Todd, P., & Van der Klaauw, W. (2001). Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design. *Econometrica*, *69*(1), 201–209.

Hanretty, C. (2021). The Pork Barrel Politics of the Towns Fund. *The Political Quarterly*, *92*(1), 7–13.

Heckman, J. J., & Snyder, J. M. (1997). Linear Probability Models of the Demand for Attributes with an Empirical Application to Estimating the Preferences of Legislators. *The Rand Journal of Economics*, *28*, S142.

Henderson, V., Storeygard, A., & Weil, D. N. (2011). A Bright Idea for Measuring Economic Growth. *American Economic Review*, *101*(3), 194–199.

Hodler, R., & Raschky, P. A. (2014). Regional Favoritism. *The Quarterly Journal of Economics*, *129*(2), 995–1033.

Holmstrom, B. (1980). *On the Theory of Delegation* (tech. rep.). Discussion Paper.

House of Commons Library. (2023). Constituency Data: Universal Credit Rollout [20 February, 2023]. https://commonslibrary.parliament.uk/constituency-data-universal-credit-roll-out/

Hübscher, E., Sattler, T., & Wagner, M. (2021). Voter Responses to Fiscal Austerity. *British Journal of Political Science*, *51*(4), 1751–1760.

Human Rights Council. (2018). Report of the Independent International Fact-Finding Mission on Myanmar. *A/HRC/39/64*. https://www.ohchr.org/Documents/HRBodies/HRCouncil/FFM-Myanmar/A_HRC_39_64.pdf

Human Rights Watch. (2016). Human Rights Watch Letter to Facebook [July 18, 2016]. https://www.hrw.org/news/2016/07/18/human-rights-watch-letter-facebook

Hyytinen, A., Meriläinen, J., Saarimaa, T., Toivanen, O., & Tukiainen, J. (2018). Public Employees as Politicians: Evidence from Close Elections. *American Political Science Review*, *112*(1), 68–81.

Ilmarinen, V.-J., Isotalo, V., Lönnqvist, J.-E., & von Schoultz, Å. (2022). Do Politicians' Answers to Voting Advice Applications Reflect their Sincere Beliefs? Comparing Publicly and Confidentially Stated Ideological Positions in a Candidate-Centred Electoral Context. *Electoral Studies*, *79*, 102504.

ITU. (n.d.). *Percentage of Individuals Using the Internet*. International Telecommunication Union. https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

Jarvis, A., Reuter, H. I., Nelson, A., Guevara, E., et al. (2008). *Hole-filled SRTM for the Globe Version 4* [available from the CGIAR-CSI SRTM 90m Database (http://srtm.csi.cgiar.org)].

Jennes, G., & Persyn, D. (2015). The Effect of Political Representation on the Geographic Distribution of Income: Evidence Using Belgian Data. *European Journal of Political Economy*, *37*, 178–194.

KAKS. (2020). *Kansalaismielipide ja kunnat. Ilmapuntari 2019.* KAKS - Kunnallisalan Kehittämissäätiö.

Knight, B. (2008). Legislative Representation, Bargaining Power and the Distribution of Federal Funds: Evidence from the US Congress. *The Economic Journal*, *118*(532), 1785–1803.

Kolen, M. J., & Brennan, R. L. (2004). Test Equating, Scaling, and Linking.

Kotakorpi, K., Poutvaara, P., & Terviö, M. (2017). Returns to Office in National and Local Politics: A Bootstrap Method and Evidence from Finland. *The Journal of Law, Economics, and Organization*, *33*(3), 413–442.

Laakso, M., & Taagepera, R. (1979). "Effective" Number of Parties: A Measure with Application to West Europe. *Comparative Political Studies*, *12*(1), 3–27.

Laver, M., Benoit, K., & Garry, J. (2003). Extracting Policy Positions from Political Texts Using Words as Data. *American Political Science Review*, *97*(2), 311–331.

Lee, D. S., Moretti, E., & Butler, M. J. (2004). Do Voters Affect or Elect Policies? Evidence from the US House. *The Quarterly Journal of Economics*, *119*(3), 807–859.

Lindbeck, A., & Weibull, J. W. (1987). Balanced-Budget Redistribution as the Outcome of Political Competition. *Public choice*, *52*, 273–297.

Litschig, S. (2012). Are Rules-Based Government Programs Shielded from Special-Interest Politics? Evidence from Revenue-Sharing Transfers in Brazil. *Journal of Public Economics*, *96*(11-12), 1047–1060.

Lujala, P. (2009). Deadly Combat over Natural Resources: Gems, Petroleum, Drugs, and the Severity of Armed Civil Conflict. *Journal of Conflict Resolution*, *53*(1), 50–71.

Lujala, P., Rød, J. K., & Thieme, N. (2007). Fighting over Oil: Introducing a New Dataset. *Conflict Management and Peace Science*, *24*(3), 239–256.

Mair, P. (2018). *Modern Psychometrics with R*. Springer.

Malik, R. (2021). (A) Political Constituency Development Funds: Evidence from Pakistan. *British Journal of Political Science*, *51*(3), 963–980.

Manacorda, M., & Tesei, A. (2020). Liberation Technology: Mobile Phones and Political Mobilization in Africa. *Econometrica*, *88*(2), 533–567.

Martin, D. A., Shapiro, J. N., & Ilhardt, J. G. (2022). Introducing the Online Political Influence Efforts Dataset. *Journal of Peace Research*, 00223433221092815.

Matakos, K., Savolainen, R., Troumpounis, O., Tukiainen, J., & Xefteris, D. (2018). Electoral Institutions and Intraparty Cohesion. *VATT Institute for Economic Research Working Papers*, *109*.

McCrary, J. (2008). Manipulation of the Running Variable in the Regression Discontinuity Design: A Density Test. *Journal of Econometrics*, *142*(2), 698–714.

McVicar, D. (2020). The Impact of Monitoring and Sanctioning on Unemployment Exit and Job-Finding Rates. *IZA World of Labor*.

Meriläinen, J. (2019). *Politician Quality, Fiscal Policy and Ideology* (Working Paper).

Meyersson, E. (2014). Islamic Rule and the Empowerment of the Poor and Pious. *Econometrica*, *82*(1), 229–269.

Miguel, E., Satyanath, S., & Sergenti, E. (2004). Economic Shocks and Civil Conflict: An Instrumental Variables Approach. *Journal of Political Economy*, *112*(4), 725–753.

Miles, T. (2018). U.N. Investigators Cite Facebook Role in Myanmar Crisis [March 12, 2018]. *Reuters*. https://www.reuters.com/article/us-myanmar-rohingya-facebook/u-n-investigators-cite-facebook-role-in-myanmar-crisis-idUSKCN1GO2PN

Miner, L. (2015). The Unintended Consequences of Internet Diffusion: Evidence from Malaysia. *Journal of Public Economics*, *132*, 66–78.

Mozur, P. (2018). Groups in myanmar fire back at zuckerberg [April 5, 2018]. *The New York Times*. https://www.nytimes.com/2018/04/05/technology/zuckerberg-facebook-myanmar.html?module=inline

Müller, K., & Schwarz, C. (2020). From Hashtag to Hate Crime: Twitter and Anti-Minority Sentiment. *Available at SSRN 3149103*.

Müller, K., & Schwarz, C. (forthcoming). From Hashtag to Hate Crime: Twitter and Anti-Minority Sentiment. *American Economic Journal: Applied Economics*.

Myanmar Information Management Unit. (2019). *MIMU Geospatial Data*. http://themimu.info/

Olken, B. A. (2009). Do Television and Radio Destroy Social Capital? Evidence from Indonesian Villages. *American Economic Journal: Applied Economics*, *1*(4), 1–33.

OpenNet Initiative. (2012). Internet filtering in Burma (Myanmar).

Ostini, R., & Nering, M. L. (2006). *Polytomous Item Response Theory Models*. Sage.

Pande, R. (2003). Can Mandated Political Representation Increase Policy Influence for Disadvantaged Minorities? Theory and Evidence from India. *American Economic Review*, *93*(4), 1132–1151.

Parsons, J. D. (2000). *The Mobile Radio Propagation Channel*. Wiley Online Library.

Peisakhin, L., & Rozenas, A. (2018). Electoral Effects of Biased Media: Russian Television in Ukraine. *American Journal of Political Science*, *62*(3), 535–550.

Pettersson-Lidbom, P. (2008). Do Parties Matter for Economic Outcomes? A Regression-Discontinuity Approach. *Journal of the European Economic Association*, *6*(5), 1037–1056.

Pierskalla, J. H., & Hollenbach, F. M. (2013). Technology and Collective Action: The Effect of Cell Phone Coverage on Political Violence in Africa. *American Political Science Review*, *107*(2), 207–224.

Polk, J., Rovny, J., Bakker, R., Edwards, E., Hooghe, L., Jolly, S., Koedam, J., Kostelka, F., Marks, G., Schumacher, G., et al. (2017). Explaining the Salience of Anti-Elitism and Reducing Political Corruption for Political Parties in Europe with the Chapel Hill Expert Survey Data. *Research & Politics*, *(January-March)*, 1–9.

PRI. (2017). In Myanmar, Fake News Spread on Facebook Stokes Ethnic Violence [November 1, 2017]. *PRI's The World*. https://www.pri.org/stories/2017-11-01/myanmar-fake-news-spread-facebook-stokes-ethnic-violence

Qin, B., Strömberg, D., & Wu, Y. (2017). Why Does China Allow Freer Social Media? Protests versus Surveillance and Propaganda. *Journal of Economic Perspectives*, *31*(1), 117–140.

Rahkonen, J. (2011). Perussuomalaisten Ruumiinavaus: Onko Työväen Protestipuolueen Kannatus Saavuttanut Vielä Ylärajaansa? *Yhteiskuntapolitiikka*, *76*(4), 425–435.

Raleigh, C., Linke, A., Hegre, H., & Karlsen, J. (2010). Introducing ACLED-Armed Conflict Location and Event Data. *Journal of Peace Research*, *47*(5), 651–660.

Regan, H. (2019). Facebook Wades into World's Longest Civil War, but Does It Know What It's Doing? [February 9, 2019]. *CNN*. https://edition.cnn.com/2019/02/08/asia/facebook-bans-myanmar-ethnic-groups-intl/index.html

Rød, E. G., & Weidmann, N. B. (2015). Empowering Activists or Autocrats? The Internet in Authoritarian Regimes. *Journal of Peace Research*, *52*(3), 338–351.

Rodrik, D. (2020). Why Does Globalization Fuel Populism? Economics, Culture, and the Rise of Right-Wing Populism. *Annual Review of Economics*, *13*.

Romarri, A. (2020). Do Far-Right Mayors Increase the Probability of Hate Crimes? Evidence from Italy. *Evidence From Italy (December 6, 2020)*.

Samejima, F. (1997). Graded Response Model. In *Handbook of modern item response theory* (pp. 85–100). Springer.

Savolainen, R. (2019). *Does Political Experience Influence Policy Positions?* (Working Paper).

Schumacher, G., & Van Kersbergen, K. (2016). Do Mainstream Parties Adapt to the Welfare Chauvinism of Populist Parties? *Party Politics*, *22*(3), 300–312.

Shapiro, J. N., & Siegel, D. A. (2015). Coordination and Security: How Mobile Communications Affect Insurgency. *Journal of Peace Research*, *52*(3), 312–322.

Shapiro, J. N., & Weidmann, N. B. (2015). Is the Phone Mightier than the Sword? Cellphones and Insurgent Violence in Iraq. *International Organization*, *69*(2), 247–274.

Singh, M. (2018). After Harsh Criticism, Facebook Quietly Pulls Services from Developing Countries [May 1st, 2018]. *The Outline*. https://theoutline.com/post/4383/facebook-quietly-ended-free-basics-in-myanmar-and-other-countries?zd=1&%20zi=buaj62ap

Soini, T. (2019). *Populismi*. Pole-Kuntatieto Oy.

Stecklow, S. (2018). Why Facebook is losing the war on hate speech in Myanmar [August 15, 2018]. *Reuters*. https://www.reuters.com/investigates/special-report/myanmar-facebook-hate/

The Washington Post. (2018). Transcript of mark zuckerberg's senate hearing [April 10, 2018]. *The Washington Post*. https://www.washingtonpost.com/news/the-switch/wp/2018/04/10/transcript-of-mark-zuckerbergs-senate-hearing/?utm_term=.b5a32ee4ec81

Vicente-Serrano, S. M., Beguería, S., & López-Moreno, J. I. (2010). A Multiscalar Drought Index Sensitive to Global Warming: The Standardized Precipitation Evapotranspiration Index. *Journal of Climate*, *23*(7), 1696–1718.

Vicente-Serrano, S. M., Beguería, S., López-Moreno, J. I., Angulo, M., & El Kenawy, A. (2010). A new global 0.5° gridded dataset (1901–2006) of a multiscalar drought index: Comparison with current drought index datasets based on the palmer drought severity index. *Journal of Hydrometeorology*, *11*(4), 1033–1043.

Voigtländer, N., & Voth, H.-J. (2015). Nazi Indoctrination and Anti-Semitic Beliefs in Germany. *Proceedings of the National Academy of Sciences*, *112*(26), 7931–7936.

von Davier, M., Yamamoto, K., Shin, H. J., Chen, H., Khorramdel, L., Weeks, J., Davis, S., Kong, N., & Kandathil, M. (2019). Evaluating Item Response Theory Linking and Model Fit for Data from PISA 2000–2012. *Assessment in Education: Principles, Policy & Practice*, *26*(4), 466–488.

Wagner, M., & Meyer, T. M. (2017). The Radical Right as Niche Parties? The Ideological Landscape of Party systemsS in Western Europe, 1980–2014. *Political Studies*, *65*(1_suppl), 84–107.

Wang, W., Kennedy, R., Lazer, D., & Ramakrishnan, N. (2016). Growing Pains for Global Monitoring of Societal Events. *Science*, *353*(6307), 1502–1503.

We Are Social. (n.d.). *Distribution of Internet Traffic in Myanmar as of January 2018, by Device*. In Statista - The Statistics Portal. https://www-statista-com.ezproxy.eui.eu/statistics/804014/share-of-internet-traffic-by-device-myanmar/

Weidmann, N. B. (2016). A Closer Look at Reporting Bias in Conflict Event Data. *American Journal of Political Science*, *60*(1), 206–218.

Weidmann, N. B., & Rød, E. G. (2019). *The Internet and Political Protest in Autocracies*. Oxford University Press.

Weidmann, N. B., & Schutte, S. (2017). Using night light emissions for the prediction of local wealth. *Journal of Peace Research*, *54*(2), 125–140.

Wintour, P. (2013). Jobcentre Was Set Targets for Benefit Sanctions [21 March 2013]. *The Guardian*. https://www.theguardian.com/society/2013/mar/21/jobcentre-set-targets-benefit-sanctions

WorldPop (www.worldpop.org - School of Geography and Environmental Science, University of Southampton; Department of Geography and Geosciences, University of Louisville; Departement de Geographie, Universite de Namur) and Center for International Earth Science Information Network (CIESIN), Columbia University (2018). (2018). *Global High Resolution Population Denominators Project - Funded by The Bill and Melinda Gates Foundation (OPP1134076)*. https://doi.org/https://dx.doi.org/10.5258/SOTON/WP00660

Yanagizawa-Drott, D. (2014). Propaganda and Conflict: Evidence from the Rwandan Genocide. *The Quarterly Journal of Economics*, *129*(4), 1947–1994.

Ylä-Anttila, T., & Ylä-Anttila, T. (2015). Exploiting the Discursive Opportunity of the Euro Crisis: The Rise of the Finns Party. In H. Kriesi & T. Pappas (Eds.), *European populism in the shadow of the great recession*. ECPR Press Colchester.

Zhuravskaya, E., Petrova, M., & Enikolopov, R. (2020). Political Effects of the Internet and Social Media. *Annual Review of Economics*, *12*.

Appendix A

Appendix to Chapter 1

1.1. Descriptive Statistics

Table A.1 provides summary statistics for municipalities, Table A.2 summarises candidate characteristics and Table A.3 provides summary statistics for parties. Table A.4 examines correlation of candidate characteristics with VAA response rate, and Table A.5 examines correlation of party characteristics with ideological positions. Table A.6 compares elected and not elected candidates. Table A.8 presents the distribution of candidates and seats across parties.

Table A.1: Municipality summary statistics

	Mean	Std.Dev.
Candidates	117.35	120.77
Competitiveness	0.80	0.17
Concentration	0.65	0.12
Council size	31.24	12.83
Education, %	62.53	6.40
Effective number of parties	3.81	1.14
Finns Party seats	2.58	2.45
Household disposable income	32346.31	5322.52
No. parties	6.83	2.23
Population	18293.49	46375.12
Population, age 15-65, %	60.87	3.70
Population, age 65+, %	22.77	5.95
Population, urban %	25.82	39.13
Unemployment rate, %	11.25	4.13

Data for election years 2004-2017. Unit of observation is municipality m in year t. Number of observations is 1168. The population characteristics are end of year values for the year before the election. Competitiveness is $1-(v1-v2)$, where $v1$ and $v2$ are two largest vote shares, and Concentration is $v1+v2$. Effective number of parties is computed as inverse of the sum of squared party vote shares. Education is share of population with higher than basic level education.

Table A.2: Candidate summary statistics

	N	Mean	Std.Dev.
Age	106061	48.65	13.69
Close, %	104525	15.18	35.88
Closely elected, %	104525	6.34	24.36
Elected, %	138102	26.68	44.23
Female, %	138102	39.68	48.92
GAL-TAN position	49346	0.54	0.12
Incumbent, %	138102	20.27	40.20
Left-Right position	49346	0.47	0.13
Member of European Parliament, %	106061	0.01	0.97
Member of Parliament, %	106061	0.45	6.69
Rerun, %	106061	64.15	47.95
VAA Response, %	138102	40.73	49.13
Vote share, %	138102	0.85	1.15
Votes	138102	69.64	186.56

Data for election years 2004-2017. Unit of observation is candidate i in year t. Number of observations is 138,102. Electoral closeness is determined for 2004-2012 elections. Information on age and political experience (MP, MEP, rerun) is not available for 2004 election.

Table A.3: Party summary statistics

	Left	SDP	Greens	Centre	Nat.Coalition	Chris.dem.	Finns
Candidates	17.85	25.96	14.32	29.42	24.60	10.00	15.16
Close candidates, %	14.43	17.74	13.20	18.95	18.35	14.67	17.58
Incumbents, %	20.31	25.27	9.84	30.10	22.69	14.70	14.85
Mean age	51.28	50.81	43.67	48.49	48.63	50.89	48.54
MPs, %	0.19	0.19	0.09	0.35	0.21	0.12	0.37
Population	25779	20564	29329	18913	20010	27002	24582
Population, urban %	35.53	29.60	41.82	26.23	28.37	37.51	33.13
Seat share, %	9.78	19.30	5.64	38.23	17.94	4.62	10.44
Seat share, close, %	2.71	4.82	1.67	7.66	4.74	1.48	2.56
VAA Response, %	49.94	45.79	76.64	50.80	59.23	58.05	46.54
Vote share, %	10.20	19.07	6.45	36.00	17.86	5.31	10.93
Women, %	36.99	40.57	60.53	39.60	37.79	47.04	24.38
N	566	764	483	834	788	536	594

Data for election years 2008-2017. Unit of observation is party p in municipality m in year t. Incumbents is the share of incumbent councillors among the party's candidates.

Table A.4: Determinants of VAA Response Probability

	VAA response probability		
	(1)	(2)	(3)
Age	-0.007^{***}	-0.007^{***}	-0.007^{***}
	(0.0002)	(0.0002)	(0.0002)
Female	0.038^{***}	0.027^{***}	0.025^{***}
	(0.004)	(0.004)	(0.003)
Incumbent	0.138^{***}	0.139^{***}	0.138^{***}
	(0.005)	(0.005)	(0.005)
Parliament	0.142^{***}	0.146^{***}	0.142^{***}
	(0.020)	(0.020)	(0.020)
Rerun	0.032^{***}	0.033^{***}	0.033^{***}
	(0.004)	(0.004)	(0.004)
Party vote share$_{t-1}$	0.099^{***}	0.0003	0.031
	(0.033)	(0.034)	(0.033)
Party candidates	0.0005	-0.0003	-0.0001
	(0.0004)	(0.0003)	(0.0003)
No. parties$_{t-1}$	0.023^{***}	0.017^{**}	-0.021^{**}
	(0.007)	(0.007)	(0.010)
No. candidates	-0.0001	0.00003	-0.0003^{***}
	(0.00004)	(0.00005)	(0.0001)
Voter turnout$_{t-1}$	0.253^{**}	0.229^{**}	-0.052
	(0.118)	(0.112)	(0.141)
log population$_{t-1}$	0.067^{***}	0.066^{***}	0.045
	(0.011)	(0.009)	(0.077)
Observations	104914	104914	104914
R^2	0.090	0.125	0.146
Year FE	✓	✓	✓
Party FE		✓	✓
Municipality FE			✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. No. parties is the effective number of parties.

Table A.5: Correlation of local party positions with party and municipality characteristics

	Left-Right		GAL-TAN	
	(1)	(2)	(3)	(4)
Year = 2012	−1.466***	−1.518***	0.421***	0.395***
	(0.019)	(0.089)	(0.022)	(0.083)
Year = 2017	−0.764***	−0.933***	−0.353***	−0.411**
	(0.024)	(0.197)	(0.026)	(0.184)
Christian Democratic Party	−0.108**	−0.111***	−0.078*	−0.074*
	(0.042)	(0.043)	(0.042)	(0.043)
Finns Party	−0.505***	−0.515***	0.403***	0.405***
	(0.040)	(0.041)	(0.043)	(0.043)
Greens	−0.253***	−0.260***	−1.192***	−1.195***
	(0.047)	(0.047)	(0.044)	(0.045)
Left Alliance	−1.024***	−1.033***	−1.309***	−1.310***
	(0.037)	(0.037)	(0.046)	(0.046)
National Coalition	0.555***	0.550***	0.251***	0.255***
	(0.028)	(0.029)	(0.029)	(0.029)
Other parties	−0.540***	−0.543***	−0.728***	−0.742***
	(0.064)	(0.065)	(0.068)	(0.068)
Social Democratic Party	−0.617***	−0.622***	−0.679***	−0.677***
	(0.027)	(0.027)	(0.033)	(0.033)
Party seat share$_{t-1}$	0.174*	0.130	0.275***	0.282***
	(0.103)	(0.108)	(0.104)	(0.107)
Candidates per party	0.002**	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Mean age	−0.011***	−0.012***	−0.004	−0.005*
	(0.003)	(0.003)	(0.003)	(0.003)
Women	0.092	0.087	−0.236***	−0.240***
	(0.080)	(0.080)	(0.084)	(0.085)
Effective no. parties$_{t-1}$		−0.007		−0.025
		(0.032)		(0.037)
log Population		−1.364***		−0.905*
		(0.472)		(0.467)
Age 0-14, %		−0.599		3.582*
		(2.072)		(2.024)
Age 65+, %		−1.225		−1.319
		(1.631)		(1.567)
Unemployment rate		−0.992		−0.241
		(0.813)		(0.847)
Income		−0.00005**		0.00001
		(0.00002)		(0.00002)
Education		3.997**		2.239
		(1.817)		(1.779)
Council size		−0.004		−0.001
		(0.003)		(0.004)
Urban %		3.067		−0.245
		(2.811)		(2.351)
Observations	5026	4984	5026	4984
R^2	0.658	0.661	0.595	0.599

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. Reference category for year effects is 2008. Reference category for parties is Centre Party. The municipality controls are measured at the end of previous calendar year. Mean age indicates mean age of candidates in the local party, and Women indicates share of women. Income is household median disposable income. Education is share of population with higher than basic level education. Concentration is the vote share of two largest parties in the municipality.

Table A.6: Summary statistics for elected and not elected candidates

	Elected			Not Elected			
	N	Mean	SD	N	Mean	SD	Difference
Age	27855	49.80	12.34	78198	48.24	14.11	1.56
Council size	27855	36.95	14.78	78198	45.64	17.21	-8.69
Female	27855	0.37	0.48	78198	0.41	0.49	-0.03
GAL-TAN position	15663	0.55	0.11	33676	0.53	0.12	0.02
Incumbent	27855	0.57	0.49	78198	0.07	0.26	0.50
Left-Right position	15663	0.48	0.13	33676	0.46	0.13	0.01
No. parties	27855	4.14	1.18	78198	4.69	1.15	-0.55
Population	27855	31093	69585	78198	71073	122128	-39980
Population, urban %	27855	37.13	42.94	78198	55.69	43.21	-18.56
Unemployed, %	27855	11.00	4.06	78198	10.85	3.91	0.14
VAA Response, %	27855	64.19	47.94	78198	49.05	49.99	15.14
Vote share, %	27855	2.09	1.55	78198	0.38	0.43	1.72
Votes	27855	157.49	355.19	78198	39.85	52.40	117.65

Data for election years 2008-2017. The Left-Right and GAL-TAN position are normalised to the zero one interval. No. parties is the effective number of parties.

Table A.7: Summary statistics for closely elected candidates from Finns Party and other parties

	Finns Party			Other parties				
	N	Mean	SD	N	Mean	SD	Difference	p-value
Candidates_m	434	178.17	158.86	6189	166.92	156.09	11.25	0.15
$\text{Close seats}_{m,t-1}$ %	404	23.77	8.83	4124	23.37	9.05	0.40	0.39
Council size	434	38.29	14.57	6189	37.43	14.69	0.86	0.23
No. parties	434	4.26	1.11	6189	3.99	1.10	0.27	0.00
Population	434	31666	62603	6189	31188	66566	478	0.88
Population, urban %	434	36.78	42.38	6189	38.06	43.00	-1.28	0.54
Turnout, %	434	61.74	5.36	6173	62.20	5.67	-0.47	0.08
Unemployed, %	434	10.28	3.70	6189	10.78	4.26	-0.49	0.01
VAA Response, %	434	46.31	49.92	6189	41.61	49.29	4.71	0.06
Vote share, %	434	1.15	0.74	6189	1.22	0.69	-0.07	0.06
Votes	434	78.06	75.67	6189	81.74	92.41	-3.68	0.34

The table presents summary statistics for closely elected candidates in 2004-2012 elections. Number of parties is the effective number of parties.

Table A.8: Distribution of all candidates and seats and close a candidates and seats by parties.

	All		Close	
Party	Candidates, %	Seats, %	Candidates, %	Seats, %
Centre	32.44	38.19	34.67	30.98
Christian Dem.	6.38	4.48	5.42	6.11
Finns Party	10.66	10.82	9.95	10.73
Greens	6.22	4.66	5.81	6.60
Left Alliance	12.22	9.72	10.22	11.88
National Coalition	19.15	18.34	19.57	19.39
Other parties	8.82	9.51	8.63	7.97
Social Dem.	19.65	19.28	20.18	20.69

Elections 2004-2012. Candidates is share of candidates over all candidates, or close candidates over all close candidates in the municipality. Seats is share of seats over all seats, or close seats over all close seats in the municipality.

1.2. Theoretical Model

Parties

There are two parties $j \in \{1, 2\}$ where we assume that Party 1 is a mainstream party and Party 2 is the populist party. Parties are both office and policy motivated, and each party has an ideal policy $b_j \in X = [0, 1]$ and we assume that $b_1 = 0$ and $b_2 = 1$. For simplicity, we assume that Party 2, the populist party, always proposes its most preferred policy, that is $x_2 = 1$.[1] The implemented policy $\tilde{x}$ is a convex combination of parties' proposed policies, given by

$$\tilde{x} = S_1(\pi_1(x_1, 1)) \cdot x_1 + S_2(\pi_2(x_1, 1)) \tag{A.1}$$

where the weights are determined by parties' seat shares S_j. Seat share is a function of vote share $\pi_j(\mathbf{x})$ such that $S_j : [0, 1] \to [0, 1]$. The vote share of party j depends on all proposed policies and is such that $\sum_j \pi_j(\mathbf{x}) = 1$. We assume purely proportional representation so that $S_j(\pi_j) = \pi_j$

The payoff of party j when policy $\tilde{x}$ is implemented is given by

$$u_j(\tilde{x}) = -\alpha|\tilde{x} - b_j| + (1 - \alpha)S_j(\pi_j) \tag{A.2}$$

where $0 < \alpha < 1$. If $\alpha = 0$, parties maximise seat share, and if $\alpha = 1$ parties only care about the implemented policy.

Voters

Voters have single peaked preferences over unidimensional policy space $X = [0, 1]$. Voter i's most preferred policy is $x^i \in X$. The distribution of voters' preferences is given by a continuous CDF $F(x)$ on X with density $f(x)$. I assume: i) sincere voting, that is each voter

[1] This assumption is also motivated by empirical literature suggesting that populist parties are less responsive to voter preferences (Adams et al., 2006), and either do not change their positions (Guiso et al., 2017), or become more extreme as their vote share increases (Wagner & Meyer, 2017).

votes for the party whose platform is closest to her most preferred policy. An indifferent voter votes for either of the parties with equal probability, and $\bar{x}$ denotes the most preferred policy of the indifferent voter. ii) $f(x) = 2(1-x)q + 2x(1-q)$, note that when $q = 0$, $f(x) = 2x$, i.e. there is more mass at the right tail of the distribution, when $q = 1$, $f(x) = 2 - 2x$, and there is more mass at the left tail of the distribution, and when $q = 1/2$ we have the uniform distribution.

For a given set of proposed policies $(x_1, 1)$, vote shares are given by

$$\begin{aligned}
\pi_1(x_1, 1) = F(\bar{x}) = F\left(\frac{x_1+1}{2}\right) &= \int_0^{\frac{x_1+1}{2}} f(s)ds = \int_0^{\frac{x_1+1}{2}} 2(1-s)q + 2s(1-q)ds \\
&= 2\left(\frac{x_1+1}{2}\right)q + \left(\frac{x_1+1}{2}\right)^2 (1-2q) \\
\pi_2(x_1, 1) &= 1 - F\left(\frac{x_1+1}{2}\right)
\end{aligned}$$

Then,

$$\begin{aligned}
\frac{\partial \pi_1(x_1, 1)}{\partial x_1} &= q + (1-2q)\left(\frac{x_1+1}{2}\right) \geq 0\,, \\
\frac{\partial \pi_2(x_1, 1)}{\partial x_1} &= -q - (1-2q)\left(\frac{x_1+1}{2}\right) \leq 0
\end{aligned}$$

Electoral competition

Timing: Parties announce platforms. Elections are held. Voters vote for the party with announced policy closest to them. Implemented policy after the election is a convex combination of the proposed policies, weighted by parties' seat shares.

Predictions

We are trying to understand what the incentives of mainstream parties are to propose their most preferred policies, or adjust their platform towards the populist challenger party. Let

us first examine Party 1's strategy in the purely proportional setting, and then see how introducing an exogenous shock to the parties' seat shares influences the strategy.

By moving towards the populist party, the mainstream party obtains a higher vote share by appealing to more socially conservative voters. Although a larger vote share means a larger weight on Party 1's policy, proposing a more rightist policy also moves the implemented policy further away from Party 1's bliss point. The more policy motivated the party is, the lower payoff it gets from increasing vote share. Even if a party is purely policy motivated, vote share influences its strategy due to its effect on the implemented policy.

The following result presents the mainstream party's equilibrium strategy and comparative statics in the absence of exogenous shocks to seat shares. Party 1's equilibrium strategy is given by

$$x_1^* = \frac{1 - 2\alpha - 2q + \sqrt{(1 - 2\alpha - 2q)^2 + 3\alpha(1 - 2q)(2 - 2\alpha q - \alpha)}}{3\alpha(1 - 2q)}, \quad q \neq \frac{1}{2} \tag{A.3}$$

and

$$x_1^* = \frac{1 - \alpha}{2\alpha}, \quad \text{when} \quad q = \frac{1}{2}$$

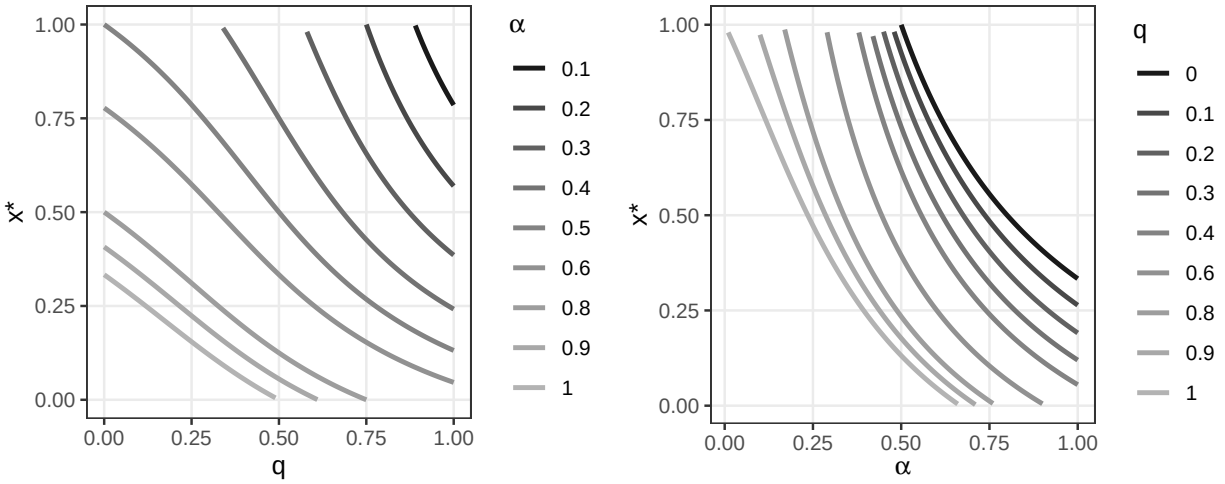
In equilibrium,

$$\frac{\partial x_1^*(\alpha, q)}{\partial \alpha} < 0\,, \text{ and} \tag{A.4}$$

$$\frac{\partial x_1^*(\alpha, q)}{\partial q} < 0 \tag{A.5}$$

First, the equilibrium strategy x_1^* is increasing as q decreases, i.e., as the demand for leftist policies decreases (median voter moves to the right). A sufficient condition for Party 1 not to fully converge to the populist position is that $q \geq \frac{1}{2}$, i.e., there is more mass at the left end of the distribution. In other words, as long as the support for the populist party is low enough, it is possible that the platforms diverge, but as electoral support for the populist policy increases, Party 1 is more likely to converge towards the populist position.

Figure A.1: x_1^* for different values of q and α.



Second, the equilibrium strategy is decreasing in α. The more policy sensitive the mainstream party is, the less it adjusts its position away from its bliss point $b_1 = 0$. If $\alpha = 1$, there cannot be full convergence for any q, whereas if $\alpha = 0$, there is full convergence ($x_1^* = 1$) for all q. Figure (A.1) presents x_1^* for different values of α and q. The policy x_1^* is decreasing in q and in α.

Populist shock

Now, let us introduce and exogenous shock to the parties' seat shares. Specifically, let $S_1 = \pi_1 - \varepsilon$ and $S_2 = \pi_2 + \varepsilon$, which means that seat shares are no longer purely proportional to vote shares. This increase in Party 2's seat share—and the symmetric decrease in Party 1's seat share—can be thought of as disproportionality generated by random election outcomes of tied candidates.

Party 1's equilibrium strategy is now

$$x_1^* = \frac{1 - 2\alpha - 2q + \sqrt{(1 - 2\alpha - 2q)^2 + 3\alpha(1 - 2q)(2 - 2\alpha q - \alpha + 4\alpha\varepsilon)}}{3\alpha(1 - 2q)}, \quad q \neq \frac{1}{2} \tag{A.6}$$

and

$$x_1^* = \frac{1 - \alpha + 2\alpha\varepsilon}{2\alpha}, \quad \text{when} \quad q = \frac{1}{2}$$

In equilibrium,

$$\frac{\partial x_1^*(\alpha, q, \varepsilon)}{\partial \varepsilon} > 0 \tag{A.7}$$

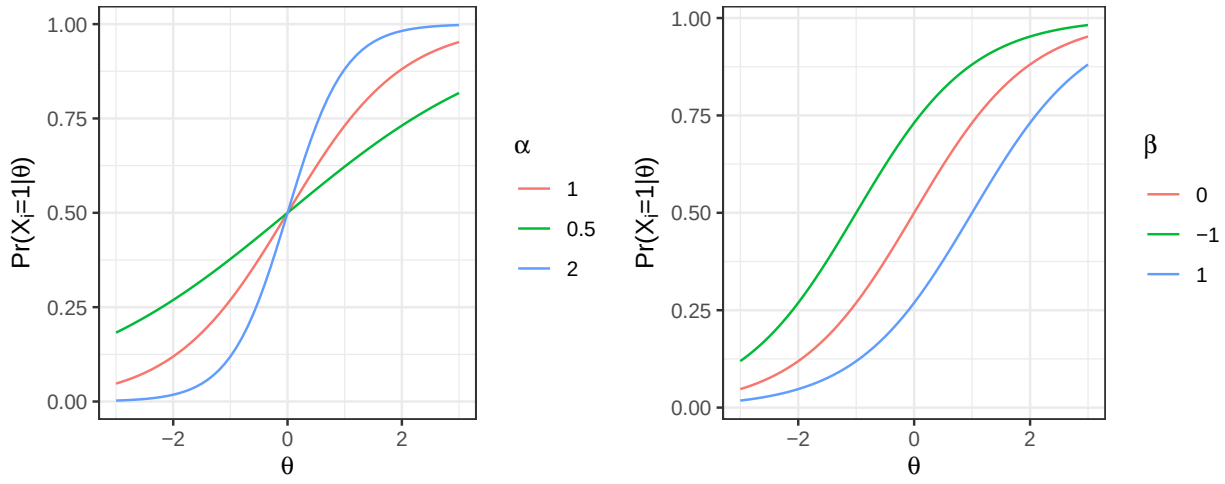
As the populist party's seat share increases due to the exogenous shock ε, Party 1's equilibrium strategy increases. With a larger shock, Party 1 obtains a lower seat share, all else equal. Party 1 therefore has to adjust its position more in order to get the same seat share.

1.3. IRT Model

Let there be V respondents and I test survey items. Individual v's responses to the I items are given by $X_v = (x_{v1}, x_{v2}, \ldots, x_{vI})$. Items can be dichotomous, for which $x_{vi} \in \{0, 1\}$, or polytomous, for which $x_{vi} \in \{1, ..., m_i\}$, where m_i is the number of response categories for item i. An individual's response to an item is modelled by an item response function, that describes how an individual with a given level of the latent trait is likely to respond (Ostini & Nering, 2006). Every response to an item is assumed to provide some information about the respondent's level of latent trait.

The voting advice application (VAA) data includes both ordered and unordered polytomous items. The ordered items are measured on a Likert-type scale, where response categories run from "completely disagree" to "completely agree." The unordered items include statements like "To provide our municipality with more revenue, we should..." with response categories such as "sell off municipal property, increase user fees, increase the property tax rate," of which the respondent is prompted to select "at least two," or "choose as many as you like," for instance. As the response categories in these items do not have a natural ordering, and they appear in several waves with slightly varying selection of response categories, I transform the items so that each response category is a binary variable. The variable then takes value one if a respondent chooses that option. Another option would be to employ the nominal response model, but I choose to transform the data to increase the number of linking items.

Figure A.2: Given latent trait θ, the probability of positive endorsement of X_i is non-linearly related to the item discrimination (α_i, slope) and difficulty (β_i, location).



The dichotomous items are calibrated with a two parameter logistic model (2PL), where the response probability is given by

$$\Pr(X_i = 1|\theta) = \frac{\exp(\alpha_i\theta - \beta_i)}{1 + \exp(\alpha_i\theta - \beta_i)} \tag{A.8}$$

where θ is the person parameter, i.e. the level of latent trait, β_i is the difficulty of item i, and α_i is item discrimination. Figure A.2 illustrates how the parameters affect the item characteristic curves. The discrimination parameter represents how quickly the probability of responding $X_i = 1$ increases as the respondent's level of θ increases. The difficulty parameter indicates where in the latent trait continuum θ a respondent has a 50% chance of responding $X_i = 1$. The probability of responding $X_i = 1$ for a given level of θ is higher the lower β_i is (Mair, 2018).

Responses to polytomous items are modelled with the graded response model (GRM) (Samejima, 1997). The model was developed for handling of ordered polytomous items and Likert-type questionnaires. It essentially consists of sequential 2-parameter models. The

model is characterised by a score category response function

$$\Pr(x_i = k|\theta) = p^*_{ik}(\theta) - p^*_{ik+1}(\theta), \quad k = 1, ..., m_i - 1 \tag{A.9}$$
$$\Pr(x_i = k|\theta) = p^*_{ik}(\theta), \quad k = m_i$$

and a cumulative category response function (CCRF), which gives the probability that a respondent with trait θ will provide a response of grade k or higher

$$p^*_{ik}(\theta) = \Pr(x_i \geq k|\theta) = 1, \quad k = 1$$
$$p^*_{ik}(\theta) = \Pr(x_i \geq k|\theta) = \frac{\exp(\alpha_i\theta - \beta_{ik})}{1 + \exp(\alpha_i\theta - \beta_{ik})}, \quad k = 2, ..., m_i. \tag{A.10}$$

Now β_{ik} is the relative difficulty of response category k of item i. The probability that any respondent provides a response of the lowest grade or higher is 1. For the higher grades the response probability is calculated as the difference between the adjacent cumulative category response functions (Kolen & Brennan, 2004).

The dimensionality of the data is not unambiguous, and in fact, models with more dimensions seem to perform slightly better.[2] This is because the item information and factors' explanatory power is fairly low, as the VAA survey was not constructed to capture any particular number of dimensions. However, estimating as high dimensional model as possible does not serve the purpose of this measurement problem. In addition to being computationally very demanding, it would lead to dimensions that are difficult to interpret and distinguish from one another, and which would therefore not be helpful in understanding differences and similarities between political parties. As there is no one true underlying dimensionality of the political space, a relatively parsimonious model is more useful (Benoit

[2]The dimensionality of the data is assessed by methods of exploratory factor analysis, item factor analysis, and by examining model fit. In multidimensional models θ and α are simply replaced with vectors $\boldsymbol{\theta}_v = (\theta_{v1}, ..., \theta_{vz})$ and $\boldsymbol{\alpha}_i = (\alpha_1, ..., \alpha_z)$, where z is the number of latent traits. Each respondent is estimated a value of latent trait on each dimension. The β_i parameter instead denotes multidimensional item location, representing distance from the origin to the point of maximum slope on the information characteristics surface in the z-dimensional space (Mair, 2018).

& Laver, 2012). To balance the different technical and conceptual considerations, I employ a four-dimensional model. I test the robustness of the econometric results against different dimensionality of the ideology space and show that the main results are not sensitive to the dimensionality of the model (see Section 1.4.).

To obtain estimates that are on the same scale, the repeating questions are used as so-called anchor items. The data from all the survey years is pooled together, and the parameters of the anchor items are constrained to be equal across years (Kolen & Brennan, 2004). The estimates of the item parameters and the values of the latent traits are obtained with maximum likelihood estimation. The latent traits are first integrated out of the likelihood function to obtain estimates for the item parameters. The observed items in a given scale are assumed to be locally independent—i.e., responses to an item are independent conditional on the latent trait. After estimating the item parameters, the values of the latent traits can be estimated (Kolen & Brennan, 2004). To avoid bias caused by differences between the examinee groups, I estimate a multiple group IRT model where each sample is allowed to have a different latent trait distribution. DeMars (2002) shows that if differences in the examinee groups' latent trait distributions are not taken into account, marginal maximum likelihood estimation yields upward biased estimated of the item difficulty parameters.

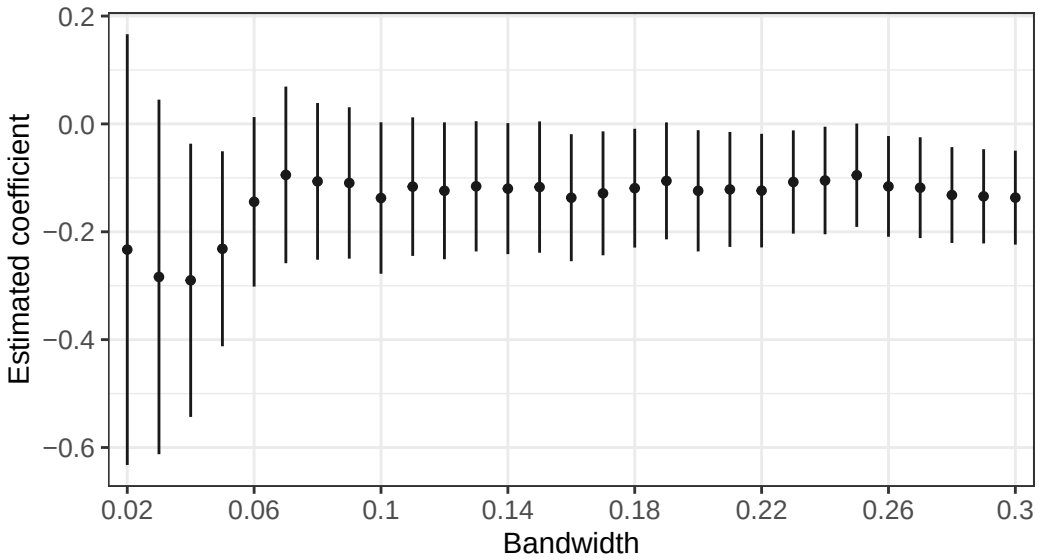
1.4. Robustness

1.4.1. Bandwidth of Electoral Closeness

To test the robustness of the results to the choice of bandwidth of electoral closeness, I construct the instrument based on different bandwidths and re-estimate the baseline model.[3] Figure A.3 plots the estimated coefficients for different bandwidths of electoral closeness. We can see that the estimates are stable for a wide range of bandwidths. The estimate starts

[3]Specifically, I estimate a 2SLS model, where distance to Finns Party is regressed on lagged Finns Party seat share, year dummies, party controls and municipality controls.

Figure A.3: Bandwidth sensitivity



Note: Each dot represents an IV estimate of $Populist_{m,t-1}$ on ideological distance from separate regressions employing a different bandwidth used to define electoral closeness. All regressions include population and municipality controls. The estimates are effect sizes. Horizontal bars represent 95 % confidence intervals.

to inflate only when the bandwidth gets below 0.05. This is due to decreasing number of identifying observations which weakens the instrument and causes the estimate to become increasingly inaccurate (Table A.9). When the bandwidth is relatively small, the estimate may also be inflated if there is a large local effect for a small group of observations. The main results can be considered reliable, as decreasing the bandwidth does not change the magnitude of the estimates much, but mainly affects precision.

1.4.2. Dimensionality of the IRT

To check robustness of the results to the dimensionality of the IRT model, I estimate also one-, two-, and three-dimensional models. I then construct aggregate party positions in these lower dimensional policy spaces. Table A.10 reports the IV estimates for the overall ideological distance to Finns Party. The outcome in all the columns is overall ideological distance, but in column (1) distances between party positions are measured in one-dimensional space (i.e., on a line), in column (2) they measured in two-dimensional space (in the Euc-

Table A.9: Robustness to bandwidth choice

	Ideological distance to Finns Party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\text{Populist}_{m,t-1}$	−0.234	−0.290**	−0.145*	−0.107	−0.138*	−0.124*	−0.120*	−0.137**
	(0.204)	(0.129)	(0.080)	(0.074)	(0.072)	(0.065)	(0.062)	(0.060)
Bandwidth	0.02	0.04	0.06	0.08	0.1	0.12	0.14	0.16
K-P F-statistic	12	36	58	55	58	65	72	79
Year dummies	✓	✓	✓	✓	✓	✓	✓	✓
Party controls	✓	✓	✓	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. The specifications are 2SLS regressions in which Finns Party seat share is instrumented with share of closely elected Finns Party candidates. Bandwidth indicates the bandwidth for electoral closeness used in constructing the instrument. Coefficients are standardised. Party controls include lagged seat share, number of candidates, average age of candidates, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. All specifications control for lagged share of close seats in the municipality.

lidean plane), and in column (3) they are measured in three-dimensional Euclidean space. Column (4) presents an estimate in 4-dimensional space which is the same as in the main analysis (see Table 1.5). The point estimates are very close to one another and to the baseline results, which indicates that the results for overall ideological distance are robust to dimensionality of the policy space.

Table A.11 presents IV estimates for distance on single dimensions from the two- and three-dimensional IRT models. In the first two columns, the outcomes are distances on the first and second dimension, respectively, derived from a two-dimensional model. In columns (3)–(5) the dependent variables are distances on the individual dimensions derived from a three-dimensional model. The estimates exhibit a very similar pattern as in the main analysis—there is some ideological convergence in the two main policy dimensions, with a clear effect in one dimension in particular.

In the two- and three-dimensional models, interpreting the dimensions is more cumbersome as they are somewhat more noisy. In the two-dimensional model, the first dimension can be interpreted as describing the GAL-TAN dimension. It includes many of the questions related to for instance immigration and the environment, but also questions about public sector size and redistribution. The second dimension is explained mostly by questions about

Table A.10: Results for overall ideological distance: robustness to dimensionality

	Ideological distance to populist party			
	1D	2D	3D	4D
	(1)	(2)	(3)	(4)
Panel A: IV				
$\text{Populist}_{m,t-1}$	-0.105^{**}	-0.111^{*}	-0.080^{*}	-0.095^{*}
	(0.047)	(0.057)	(0.048)	(0.055)
Panel B: OLS				
$\text{Populist}_{m,t-1}$	-0.070^{***}	-0.098^{***}	-0.082^{***}	-0.077^{**}
	(0.022)	(0.027)	(0.027)	(0.030)
Panel C: Reduced form				
$\text{Populist}_{m,t-1}$	-0.048^{**}	-0.051^{**}	-0.037^{*}	-0.044^{*}
	(0.021)	(0.025)	(0.022)	(0.024)
Observations	3248	3248	3248	3248
Year dummies	✓	✓	✓	✓
Party dummies	✓	✓	✓	✓
Party controls	✓	✓	✓	✓
Population controls	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. The dependent variable in all specifications is overall ideological distance to the Finns Party. In column (1) it's estimates with a unidimensional IRT model, and in column (2)–(4) it's measured from a 2-, 3-, or 4-dimensional IRT model, respectively. Party controls include number of candidates, lagged seat share, average age of candidates, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. All specifications control for lagged share of close seats in the municipality. All specifications control for lagged share of close seats in the municipality. standardised coefficients.

provision of public services and public sector size, but it also includes questions that are not related to economic policy. In case of the three-dimensional model, the first dimension captures more of the items related to social and cultural issues, whereas the second dimension is more related to economic policy. The third dimension describes attitudes to municipal functions. When policy positions are derived from a two-dimensional model (columns (1) and (2)), the point estimates suggest similar alignment on both dimensions, but the effect is statistically significant only on the first dimension. When policy positions are derived from a three-dimensional model (columns (3)–(5)), the estimates suggest that convergence takes

Table A.11: Results for ideological distance: robustness to estimated dimensionality

	2 Dimensional IRT		3 Dimensional IRT		
	θ_1	θ_2	θ_1	θ_2	θ_3
	(1)	(2)	(3)	(4)	(5)
Populist$_{m,t-1}$	-0.096^{*}	-0.059	-0.068	-0.090^{**}	-0.020
	(0.050)	(0.065)	(0.052)	(0.040)	(0.060)
Observations	3248	3248	3248	3248	3248
Year dummies	✓	✓	✓	✓	✓
Party dummies	✓	✓	✓	✓	✓
Party controls	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. The outcome θ_j^z indicates distance on dimension j measured with a z-dimensional IRT model. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. All specifications control for lagged share of close seats in the municipality.

place mostly on the second dimension. Distance between parties is also decreasing on the first dimension, but the effect is somewhat smaller and only marginally significant.

1.4.3. Sensitivity to Distance Measure

When distance is measured in higher than one-dimensional space, different metrics are not equivalent. Table A.12 presents results for ideological distance to Finns Party in four-dimensional space, measured with different metrics. For reference, in column (1) the outcome is calculated with the same Euclidean distance that has been used throughout the article. In column (2) the outcome is measured as squared Euclidean distance. It puts more weight on larger differences, and the point estimates are slightly smaller. In column (3) the outcome is measured as city block (or Manhattan) distance, and in column as (4) Chebyshev distance. The former is sum of absolute distances in each dimension, whereas the latter only takes into account the dimension with the most significant distance.

Table A.12: Robustness to distance measure

	Ideological distance to populist party			
	Euclidean (1)	Sq.Euclidean (2)	City Block (3)	Chebyshev (4)
$\text{Populist}_{m,t-1}$	-0.095^{*}	-0.079	-0.076	-0.093^{**}
	(0.055)	(0.053)	(0.054)	(0.046)
Observations	3248	3248	3248	3248
Year dummies	✓	✓	✓	✓
Party dummies	✓	✓	✓	✓
Party controls	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. The dependent variable in all specifications is overall ideological distance to the Finns Party. In column (1) it's calculated as 4-dimensional Euclidean distance; in column (2) as squared Euclidean distance; in column (3) as city block distance (L_1); in column (4) as Chebyshev distance. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. All specifications control for lagged share of close seats in the municipality.

1.4.4. Log Outcome

Finally, because the main outcome is a distance, it is limited to non-negative values. This means that the error term is always positive, which could bias down the slope. Therefore, as a robustness check I also estimate the model using a log outcome. The outcome in Table A.13 is logarithm of the ideological distance, and the coefficients represent percentage change in the outcome when the Finns Party seat share changes by one standard deviation. The point estimates are naturally different from the baseline model as their interpretation is different, but the pattern of decreasing distance is the same, and if anything, the estimates are more precise.

Table A.13: IV estimates for ideological distance to Finns Party: log outcome

	Log Ideological distance to Finns Party			
	(1)	(2)	(3)	(4)
Panel A: IV				
$\text{Populist}_{m,t-1}$	-0.041^{**}	-0.044^{**}	-0.046^{**}	-0.037^{*}
	(0.019)	(0.019)	(0.020)	(0.019)
Panel B: OLS				
$\text{Populist}_{m,t-1}$	-0.043^{***}	-0.043^{***}	-0.042^{***}	-0.031^{***}
	(0.010)	(0.010)	(0.010)	(0.011)
Panel C: Reduced form				
$\text{Populist}_{m,t-1}$	-0.019^{**}	-0.021^{**}	-0.021^{**}	-0.017^{**}
	(0.009)	(0.009)	(0.009)	(0.009)
Observations	3248	3248	3248	3248
Year dummies	✓	✓	✓	✓
Party controls		✓	✓	✓
Municipality controls			✓	✓
Party dummies				✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. All specifications control for lagged share of close seats in the municipality.

1.5. Additional Tables

Table A.14: IV estimates for ideological distance to Finns Party: cross-sectional estimates by dimension

	Left-Right (1)	GAL-TAN (2)	Redistribution (3)	Local issues (4)
Panel A: All years				
$\text{Populist}_{m,t-1}$	−0.056	−0.100*	−0.045	0.044
	(0.049)	(0.054)	(0.050)	(0.064)
Observations	3248	3248	3248	3248
Panel B: 2008				
$\text{Populist}_{m,t-1}$	−0.038	0.047	0.029	0.058
	(0.046)	(0.054)	(0.050)	(0.064)
Observations	801	801	801	801
Panel C: 2012				
$\text{Populist}_{m,t-1}$	−0.072	−0.031	0.012	−0.051
	(0.054)	(0.042)	(0.052)	(0.045)
Observations	1310	1310	1310	1310
Panel D: 2017				
$\text{Populist}_{m,t-1}$	0.014	−0.244**	−0.139*	0.114
	(0.077)	(0.101)	(0.077)	(0.112)
Observations	1137	1137	1137	1137
Party controls	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓
Party dummies	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Robust standard errors clustered at municipality level. Coefficients are standardised. The dependent variable is ideological distance to Finns Party on the Left-Right dimension (column (1)), GAL-TAN dimension (column (2)), Redistribution dimension (column (3)), or Local issues dimension (column (4)). Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. All specifications control for lagged share of close seats in the municipality. Panel A controls for year effects.

Table A.15: IV estimates for ideological distances to Finns Party: by dimension and by party

	Left (1)	SDP (2)	Greens (3)	Centre (4)	Nat.Coalition (5)	Chris.dem. (6)
Panel A: Total distance						
$\text{Populist}_{m,t-1}$	-0.252^{*}	-0.154	0.103	-0.272^{***}	-0.134	-0.056
	(0.134)	(0.122)	(0.133)	(0.103)	(0.098)	(0.153)
Panel B: Left-Right						
$\text{Populist}_{m,t-1}$	-0.282^{**}	0.002	0.190	-0.113	-0.042	0.019
	(0.141)	(0.103)	(0.165)	(0.095)	(0.097)	(0.140)
Panel C: GAL-TAN						
$\text{Populist}_{m,t-1}$	-0.245	-0.218^{*}	0.037	-0.334^{***}	-0.254^{***}	-0.137
	(0.151)	(0.130)	(0.154)	(0.093)	(0.091)	(0.134)
Observations	424	538	384	574	558	413
Party controls	✓	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓	✓
Party dummies	✓	✓	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$ Robust standard errors clustered at municipality level. Coefficients are standardised. The dependent variable in Panel A is ideological distance to Finns Party on the Left-Right dimension, and on Panel B ideological distance on the GAL-TAN dimension. Each column represents a set of specifications for a different subset of local party groups. Party controls include number of candidates, lagged seat share, average age, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. The specifications in Panel A include year dummies. All specifications control for lagged share of close seats in the municipality.

Table A.16: IV estimates for average party positions: by party

	All (1)	Left (2)	SDP (3)	Greens (4)	Centre (5)	Nat.Coalition (6)	Chris.dem. (7)	Finns Party (8)
Panel A: Left-Right								
$\text{Populist}_{m,t-1}$	0.007	0.082	-0.079	-0.075	-0.022	0.036	0.139	-0.043
	(0.026)	(0.084)	(0.059)	(0.092)	(0.044)	(0.067)	(0.091)	(0.076)
Panel B: GAL-TAN								
$\text{Populist}_{m,t-1}$	0.021	0.157	0.107	-0.248^{**}	0.046	0.056	0.030	-0.046
	(0.029)	(0.117)	(0.098)	(0.113)	(0.071)	(0.074)	(0.093)	(0.095)
Observations	4393	560	758	478	828	783	532	591
Year dummies	✓	✓	✓	✓	✓	✓	✓	✓
Party controls	✓	✓	✓	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$ Robust standard errors clustered at municipality level. Coefficients are standardised. The dependent variable is ideological position on the Left-Right dimension (Panel A), and GAL-TAN dimension (Panel B). Each column represents a set of specifications for a different subset of local party groups. Party controls include number of candidates, lagged seat share, average age of candidates, and share of women. Municipality controls include lagged effective number of parties, lagged log population, lagged shares of young and old, lagged unemployment rate, lagged median income, and lagged education. The specifications in Panel A includes year dummies. All specifications control for lagged share of close seats in the municipality. Column (1) includes Party dummies.

1.6. Additional Figures

Figure A.4: Distributions of estimated latent traits from 4-dimensional IRT model.
Left-Right is increasing in right; GAL-TAN is increasing in TAN; Redistribution is increasing in support for more redistribution; Budget Control is increasing in support for tighter budget control.

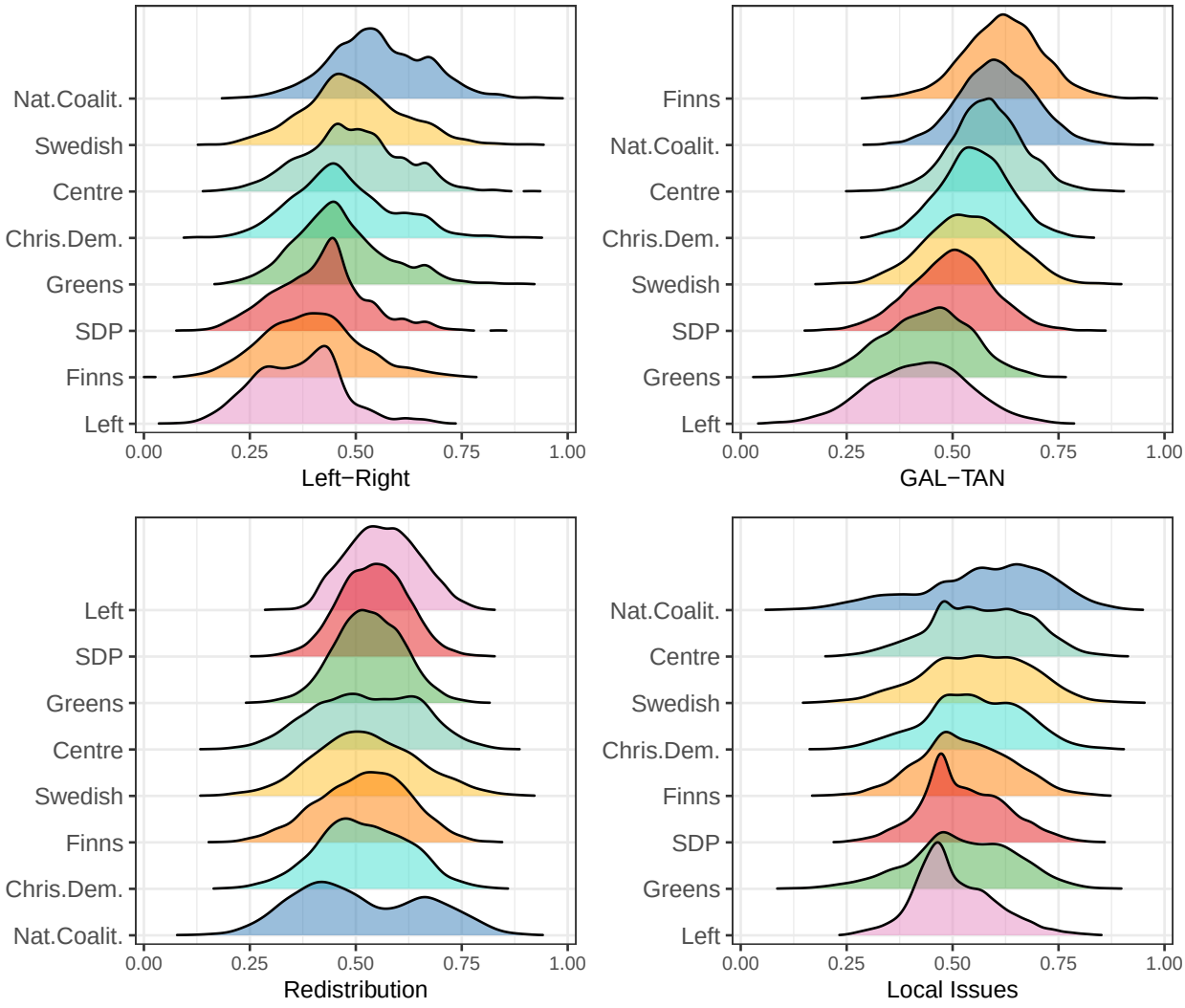


Figure A.5: Distribution of candidates' electoral closeness for elected and non-elected candidates, omitting $\tau < 0.01$ and $\tau > 0.99$.

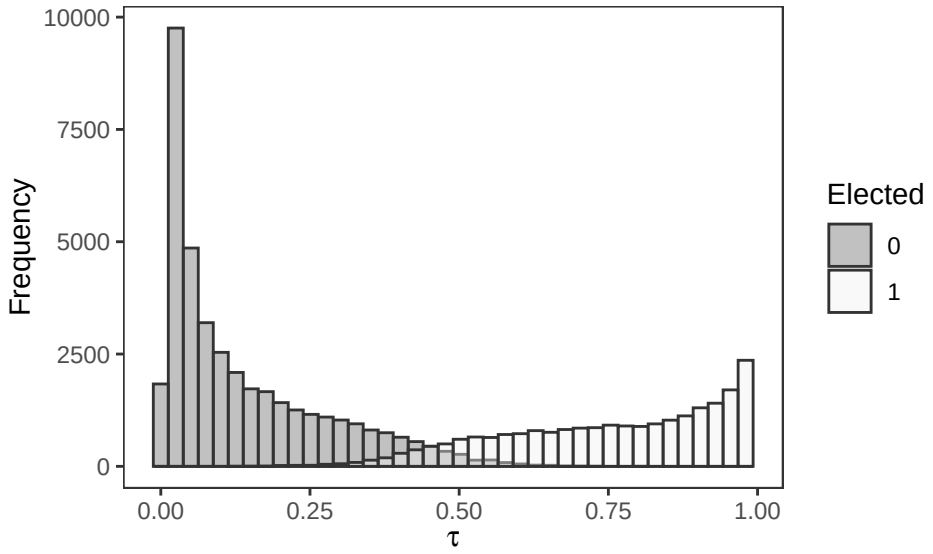
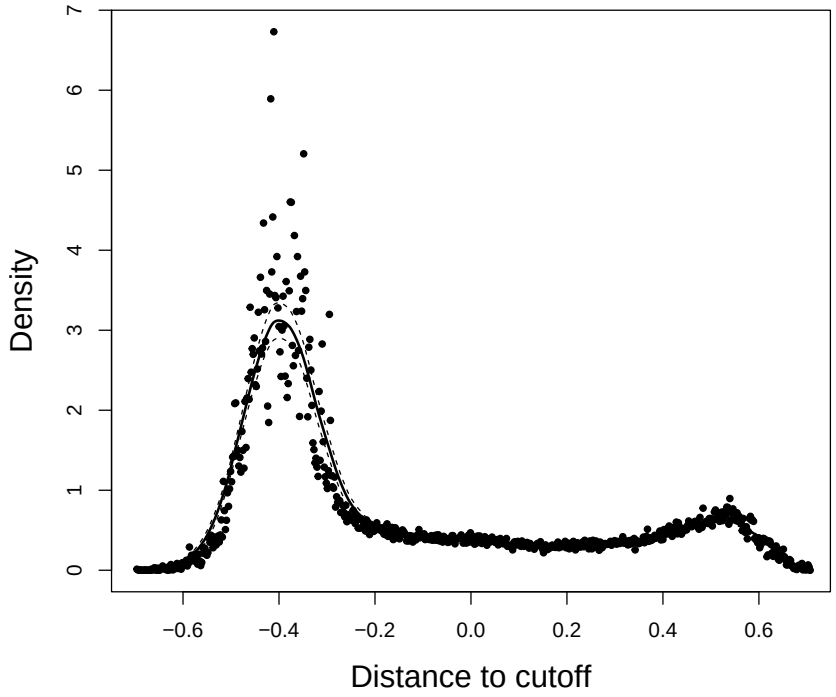


Figure A.6: McCracy test of discontinuity in the distance to electoral cutoff.
Discontinuity est. $= -0.015$ with s.e. $= 0.05$



1.7. VAA Questionnaires

YLE voting advice application questionnaire 2008

- If there is no other option, we should raise the municipal tax rate rather than cut from the municipal services.
- It is nowadays too easy to be admitted to social welfare.
- The environmental and natural values in my municipality can be flexible if it can create more jobs or increase residents' economic well being.
- My municipality should reduce the number of municipal employees, because there are too many of them.
- The municipal user fees should be made more progressive in income.
- If one of the parents is at home, the children should not have a right to daycare.
- If we have to choose, it is better to cut funding from health centres than comprehensive schools, because there are private health centres but no private schools.
- To provide our municipality with more revenue, we should... [choose 2]:
  - Increase the property tax rate for residential buildings.
  - Increase the property tax rate for holiday houses.
  - Increase user fees.
  - Sell off municipal property.
  - Attract business with favourable conditions or financial support.
  - Attract new well-off taxpayers by offering them building plots.
  - Request for more state subsidies.
  - Consider a municipal merger.
  - Establish new user fees.
- Which of the following services should we privatise? [choose at least 1]:
  - Comprehensive school.
  - Health centres.

  - Elder care.
  - Day care.
  - Municipal engineering.
  - Social welfare.
  - Substance abuse treatment and rehabilitation.
  - Fire and rescue services.
  - Zoning.
  - Specialised health care.
  - Water utility.
  - None of the above.

YLE voting advice application questionnaire 2012

- The old should have a universal right to a retirement home similar to one enjoyed now by children and daycare.
- Privatisation of municipal health care would increase efficiency and lower the costs.
- The health centre fees can be raised in my municipality.
- If your municipality received a large donation to improve the municipal services, which services should be mainly targeted? [choose 2]:
  - Social services.
  - Day care.
  - Elder care.
  - Schools.
  - Nursing staff wages.
  - Health centres.
  - Specialty health care.
- My municipality should take in refugees.
- If one of the parents is at home, we should limit the right of the family to have their

child placed in daycare.

- Too little attention has been paid to the marginalisation of children and youth in my municipality.
- It is nowadays too easy to be admitted to social welfare.
- It should be possible to recycle trash in the public trash cans in my municipality.
- My municipality should spend more money in the road maintenance.
- The environmental and natural values in my municipality can be flexible if it can create more jobs.
- We should raise the property tax rate in my municipality.
- If my municipality were to merge with another municipality in the near future, a consultative referendum should be held on the merger decision.
- The voting age in the municipal elections should be lowered to 16 years.
- To balance the municipal budget in your municipality we should... [choose 2]:
  - Cut down municipal services.
  - Increase or establish new user fees.
  - Increase taxes.
  - Sell off municipal property.
  - Develop the business in the municipality.
  - Issue more debt.
- Members of parliament should not run in the municipal elections.
- The five-year long dismissal period for the municipal employees in conjunction with a municipality mergers is too long.
- Municipal employees should not be nominated as municipal board members.
- Let's assume your municipality is financially troubled. You must save and there is a trade-off between the services for the elderly and the children. What will you do?
  - I cut from children.
  - I cut from elderly.

  - I try to cut evenly from both.
  - We must save but I still suggest issuing more debt.
- A historical building has gotten in bad shape. What will you do?
  - History is more valuable than temporary economic gain. We must refurbish the building.
  - Economic gain is more valuable than history. The plot should be taken for more profitable use.
  - There's a risk that the decision will be too rushed. I suggest postponing the decision.
  - I listen to the residents' opinion and decide based on that.
  - We cannot compare historical and economic value. I don't want to take stand for or against.
- Your municipality is planning a new residential area for immigrants and social welfare recipients together with more well-to-do population. What do you think about it?
  - I see such a project outright wrong. I cannot understand the pursuit of a diverse residential culture.
  - I wonder if the project could create something new socially and humanly that we could learn from.
  - I am actively seeking a compromise without nailing my own position.
  - I find the project exclusively positive. I am mainly amazed at the intolerance of others.
- Politics and life require social skills. This means the ability to get along in different groups and between different people. In a position of trust, you may also be required to have thoughts and reasoned opinions on often quite complex matters. How do you work?
  - I think I am social, I enjoy being in large groups and I enjoy being the centre of attention. I am proactive and I tell openly about myself and my thoughts.

  - I am social, but I know I am at my best in smaller groups where you can delve deeper into things.
  - I love quick decisions, visions and I am happy to plan for the future with others.
  - I have a lot of vision, I want to envision and think quietly before I come out with my thoughts.
- There are situations at work in which you have to solve complex issues. How would you describe your general attitude in decision situations?
  - I am constantly wary in order to avoid mistakes and wrong decisions. I check all documents and minutes with particular care.
  - I trust that others will not try to mislead me.
  - I get anxious if I'm not in control of big and small things.
  - I try to be perfect. I demand it of myself and my subordinates.
  - I think life cannot be controlled and it is useless to waste energy with all kinds of nagging.

YLE voting advice application questionnaire 2017

- Young people must be obliged to pursue postgraduate studies or work placements directly after primary school.
- The municipality should provide all children a right to free daycare.
- Schools should have a vegetarian day at least once a week.
- The municipality should support the culture by providing its premises free of charge to cultural associations.
- The school teaching groups are already so big that learning is disrupted.
- The old should have a universal right to a retirement home because the current home care is not sufficient.
- The jobs of current municipal employees must be secured in the social and health care reform.

- Functioning of social and health services is more important than their location.
- Privatisation of municipal health care would increase efficiency and lower the costs.
- favouring outpatient care in mental health creates a feeling of insecurity.
- Municipal tax can be reduced steeply, as most of the tasks are transferred to the provincial administration.
- Construction must be speeded up by limiting citizens' right of appeal.
- Private car use is favoured too much in zoning.
- The municipality should support businesses by offering them cheap plots.
- The environmental and natural values in my municipality can be flexible if it can create more jobs.
- My municipality should take in refugees.
- An annual fee could be charged for library services.
- The income thresholds for municipal rental housing must be removed.
- My municipality is spending too much money on building and maintaining sports facilities.
- Everyone should be able to get to the services by public transport.
- Things were not better before—the changes in the Finnish lifestyle have been good.
- We need strong leadership that can solve problems without the need for compromise.
- It is more important for children to be curious and independent than to be well behaved and obedient.
- In essence, life is a race for resources and power, and you can't succeed without a fight.
- Our society would have fewer problems if people were treated more equitably.
- In Finland, everyone has equal opportunities for wealth and happiness.
- Public transport in the metropolitan area must be free of charge.
- The municipality must employ refugees at all costs.
- The municipality must restrict construction in sparsely populated areas.
- In their food service, the municipality must choose domestic ingredients whenever they

are available.

- The population base of my municipality is too small to carry out the statutory tasks.
- The most important task of a municipal councillor is to defend the interests of his constituency.
- Which committee do you think will be the most important in your municipality in the coming election term?
- Providing social and health services to the citizens is better done by the provincial government than by my municipality.

Appendix B

Appendix to Chapter 2

2.1. Data Sources and Summary Statistics

Table B.1: Township summary statistics

	N	Mean	std.Dev.
Conflict dummy, GDELT	330	0.64	0.48
Conflict dummy, ACLED	330	0.17	0.38
Conflict events, per 1000, GDELT	330	0.54	3.90
Conflict events, per 1000, ACLED	330	0.03	0.19
Conflict events, GDELT	330	50.97	328.63
Conflict events, ACLED	330	2.85	13.15
Cell phone coverage, MPT, %	330	52.59	39.19
Cell phone coverage, other, %	330	54.21	40.54
Cell tower density, per 1000, MPT	330	0.35	1.07
Cell tower density, per 1000, other providers	330	0.43	1.22
Population in 2014	330	152363.33	95347.49
Population density, 2014	330	2079.82	7140.20
Population, urban, %	330	28.10	29.03
Population aged 15-64, %	330	64.99	5.14
Population with no ID, %	330	27.29	12.85
Electricity, %	330	31.31	27.49
Landline phone, %	330	5.47	6.90
Mobile phone, %	330	31.62	22.87
Internet at home, %	330	6.31	10.58
Distance to major road, km	330	12.52	16.88
Distance to railway, km	330	51.25	66.46
Distance to nearest city, km	330	37.96	27.83
Distance to nearest cell tower, MPT, km	330	21.39	29.47
Distance to nearest cell tower, other, km	330	27.23	41.11
Area, sqkm	330	2025.95	1864.31
Roads, km	330	115.27	104.35
Mean elevation, m	330	389.58	461.06
Slope, degrees	330	88.49	5.17
Ruggedness	330	32.43	29.31
Agriculture coverage, %	330	47.01	34.31
Forest coverage, %	330	31.78	30.15
Urban coverage, %	330	9.06	26.26
Diamonds, dummy	330	0.11	0.31
Oil fields, %	330	12.37	27.49
Drought, %, 2016	329	2.71	4.02
Nightlight, 2015	330	2.47	7.84

The conflict dummies take value one if a conflict event was recorded in the township between 1 June 2016 and 31 August 2017. Number of conflict events refers to the same time period. Cell phone coverage is the share of township area with sufficient cell phone signal for cell phone reception. Distances are measured from township centroid. City refers to capital, state/region capital or district town (usually district capital). There are 330 townships.

Table B.2: Description of variables and data sources

Variable	Source	Description
Conflict events	GDELT, ACLED	Number of violent events, obtained from GDELT 1.0 (GDELT Project, 2019) and Armed Conflict Location & Event Data Project (ACLED, 2019a). From GDELT, only events in the CAMEO event categories coerce, assault, fight, and use conventional mass violence, are used. From ACLED, only events categorised as violent events are used.
Cell phone towers	OpenCelliD	Data on cell phone towers is obtained from Open cell ID, available from https://www.opencellid.org. The data includes cell tower coordinates, network type, mobile network code, timestamp for when the measure was added to the database.
Population	Myanmar census 2014, WorldPop	Cross-sectional specifications use population data from the census. The panel specifications use gridded population data from WorldPop (2018). I use the unconstrained individual countries UN adjusted 100 m resolution population counts for Myanmar in 2015–2018. From the census, I calculate a dummy for below median share of urban population, share of working age (15-64) population, share of population (10 years and over) with no identity card, share of households with electricity as their source of lighting, and share of households with a mobile phone, with a landline phone, and with internet at home.
Topography	SRTM	Measures of terrain elevation are obtained from NASA's Shuttle Radar Topography Mission (SRTM). I use the 1 arc second resolution data provided by CGIAR-CSI GeoPortal (Jarvis et al., 2008). Mean elevation, slope, and ruggedness for each township or village tract are computed with GQIS.
Distances	Myanmar Information Management Unit	Myanmar town points, road network, railway network as geospatial data (Myanmar Information Management Unit, 2019). I calculate the distance from township (or village tract) centroid to the nearest point of the feature. I also calculate road length in each administrative unit.
Drought	SPEI	Drought is measured with the standardised Precipitation-Evapotranspiration Index (SPEI) (Vicente-Serrano, Beguería & López-Moreno, 2010; Vicente-Serrano, Beguería, López-Moreno et al., 2010). I use the SPEIbase v2.7, available from https://spei.csic.es/database.html at 0.5 degree resolution. I calculate share of year an area experiences drought (SPEI≤ -1.5), and I use mean for 2016 in the cross-sectional models.
Nightlight	EOG	Average annual night light intensity from the Visible and Infrared Imaging Suite (VIIRS) Day Night Band (DNB). Data is downloaded from Earth Observation Group (EOG) as Annual VNL v2.1 (Elvidge et al., 2021), and it is available at 15 arc second resolution.
Land use	ESA CCI-LC	Global land cover maps at 300 m resolution for 2015, produced by the European Space Agency (ESA) Climate Change Initiative (CCI) (ESA, 2017). I follow the IPCC classes and aggregate to the categories "forests" (classes 50, 60, 70, 80, 90, 100, 160, 170), "agriculture" (classes 10, 20, 30, 40), and "urban" (class 190). The values indicate the percentage of the area covered by the land cover category.
Gemstones	DIADATA, GEMDATA	Dummy for diamond or gemstone site. The variable is constructed by combining data sets on gemstone (Lujala, 2009) and diamond deposits (Gilmore et al., 2005).
Oil	PETRODATA	Share of the administrative unit covered by oil or gas fields, data set version 1.2. (Lujala et al., 2007).
Destroyed settlements	UNITAR - UNOSAT	Satellite-detected fires and destroyed or otherwise damaged settlements in Buthidaung, Maungdaw, and Rathedaung Townships in Northern Rakhine State in Myanmar, provided by UNITAR - UNOSAT & United Nations Institute for Training and Research - Operational Satellite Applications Program (Garcia, 2018).

2.2. Estimation of Cell Phone Coverage

As cell phone signals are ultra high frequency radio signals, it is possible to use an electromagnetic signal propagation model to calculate predicted coverage. Cell phone signals' primary propagation mode is direct wave, and the signal strength decreases proportionally with the inverse of squared distance. The signal strength can also be greatly reduced by objects, such as hills, buildings, or dense foliage, lying on the line of sight. Even if an object does not block the line of sight but lies in the Fresnel zone, it can reduce the signal (Parsons, 2000). Therefore, for a given cell tower height and transmission strength, the signal strength in a given location is primarily determined by distance to the tower and whether the receiver (i.e., mobile phone) is in line of sight of the tower.

Because I do not have access to the technical details of the cell phone towers, I approximate the parameters needed for the calculation. The result can therefore be considered as an augmented line of sight analysis, where the ITM is used to define a potential coverage area, as determined by the cell tower locations and plausible parameter values. Intuitively, I take into account if a given point is within the maximum range to receive a signal, and whether there exists a line of sight between that point and a cell tower.

I apply the irregular terrain model (ITM), also known as Longley-Rice model, to calculate the predicted coverage area. To apply the ITM, I use a freely available software for RF propagation simulation, called Radio Mobile.[1] I start by defining the maximum allowed path loss. Maximum allowed path loss is defined as: Transmitter power (dBm) − Transmitter attenuation (dB) + Antenna gains (dBi) − Receiver line loss (dB) − Receiver sensitivity (dB). If the free space path loss (i.e., path loss due to distance) and the propagation loss due to topography are less than the maximum allowed path loss, the signal is sufficiently strong for reception. The prediction is then calculated for 200 m resolution grid cells.

I approximate the cell phone tower parameters to mimic transmission in a rural area.

[1]Radio Mobile is copyright of Roger Coudé VE2DBE.

Antenna height is assumed to be 35 meters, and antennas are assumed to be omnidirectional. In reality, antennas are usually directional, and there are several antennas in a cell tower that cover different segments around the tower. Cell phone tower heights vary a lot, and 30–40 meter towers can be considered high. I limit the maximum range of the signal to 25 km. Due to timing advance, the theoretical maximum range for a standard GSM equipment is 35 kilometres, but because of limitations of network architecture and poor performance of cell phone antennas, in practice the range can be much lower.

Both the free space loss and loss due to obstacles also depend on the signal frequency. I infer frequency from the network type. For example, GSM signal is delivered in 900 or 1800 MHz frequency bands in most parts of the world. Typically, the spectrum is divided into bands that are allocated for different service providers by a national regulator. To approximate the frequency, I use the frequency bands that the mobile network operators have reported in the Mobile World Live website. I use the same parameter values for all cell towers. In reality, all the parameters are likely to vary depending on the propagation environment (e.g., urban vs rural) and MNO (Parsons, 2000).

2.3. Measurement Error in Conflict Data

Because the information on conflict events is largely based on news reporting, it may be subject to reporting bias. GDELT is based on fully automated monitoring of the media, and although ACLED also uses reports from NGOs and international organisations, it also relies to a large extent on media sources. Weidmann (2016) distinguishes different forms of selective reporting. First, reporting bias in which some conflict events that happened are failed to be reported leads to classical measurement error. If that is uncorrelated with the independent variable, it does not bias the results, but will decrease precision of the estimates.

The more concerning alternative is that reporting of conflict events is correlated with the independent variable, which would bias the estimates. It is likely that cell phone coverage

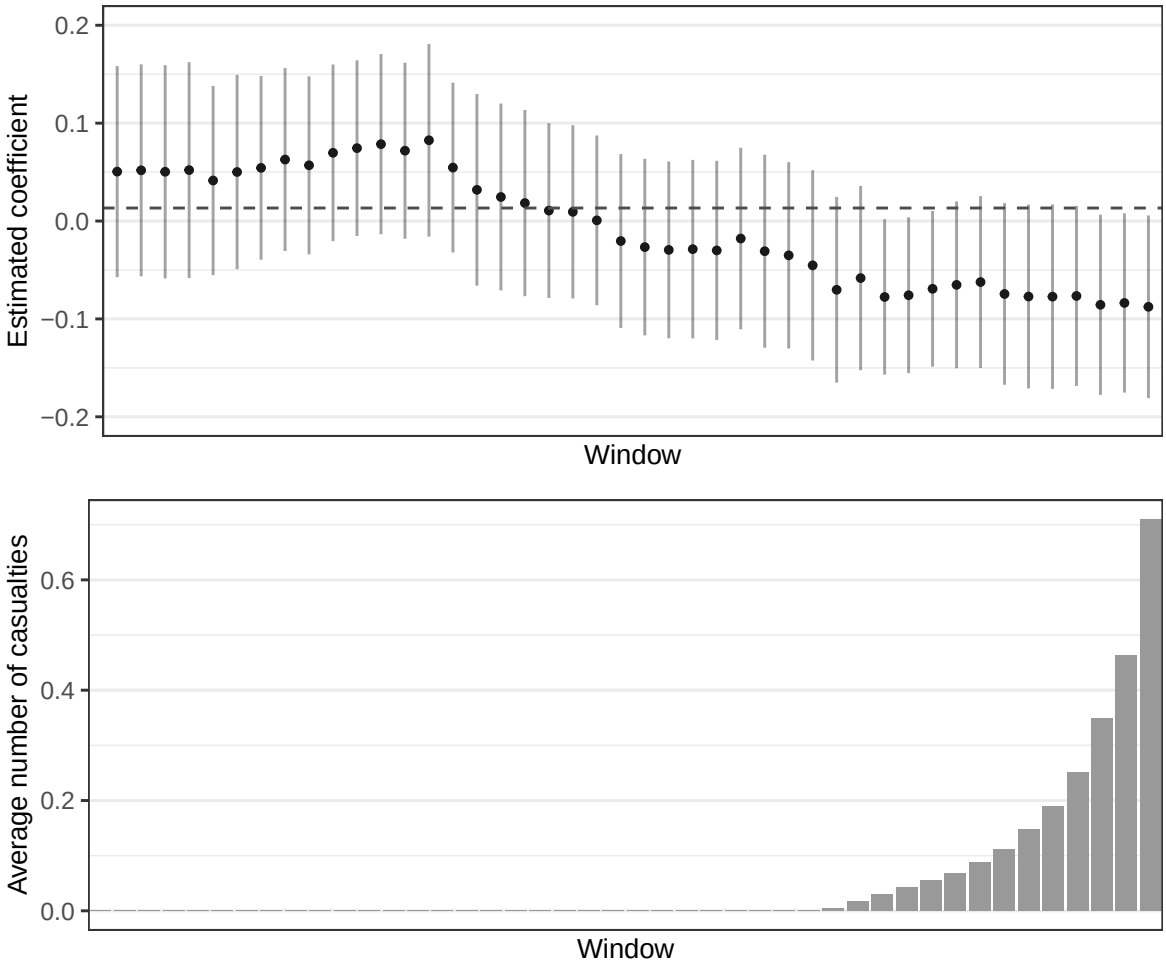
is associated with reporting of conflict events, and Weidmann (2016) demonstrates that in that case both the proportion of reported violence and how strongly reporting depends on cell phone coverage affect the resulting bias. An alleviating factor in my analysis is that I am estimating the effect of cell phone coverage from one wireless service provider, which involved free use of Facebook, rather than access to cell phone coverage or mobile internet per se. In this setting I can control for cell phone coverage from other service providers. It is therefore likely that conflict reporting is less dependent on the independent variable. However, it is still possible that by encouraging internet use, the treatment could also influence conflict reporting.

To get a sense of how dependent the effect of MPT cell phone coverage is on possible reporting bias I conduct a sensitivity analysis following Weidmann (2016) and Dafoe and Lyall (2015). The idea is that more severe conflict events, e.g., those involving more casualties, are more likely to be reported in the media regardless of local cell phone coverage. Therefore, the dependence of conflict reporting on cell phone coverage should be stronger with *less severe* events. The estimated effect of cell phone coverage on conflict should be more positive (or less negative) for less severe events. I estimate the cross-sectional model using equation (2.1), with full set of controls, on subsets of conflict events of increasing severity.

Figure B.1 presents the sensitivity analysis for ACLED data. I use data on the events that take place in the treatment period, I order them by number of fatalities, and I estimate the effect of MPT cell phone coverage on a conflict dummy in a sliding window containing 50% of the events ($N = 651$), moving the window in steps of 15 events. Most of the events are not associated with any fatalities. The estimates seem to have a slight downward trend, such that subsets with fatalities yield more negative estimates. This pattern implies that the estimates based on ACLED may be somewhat confounded by reporting bias, and this bias likely attenuates the estimates.

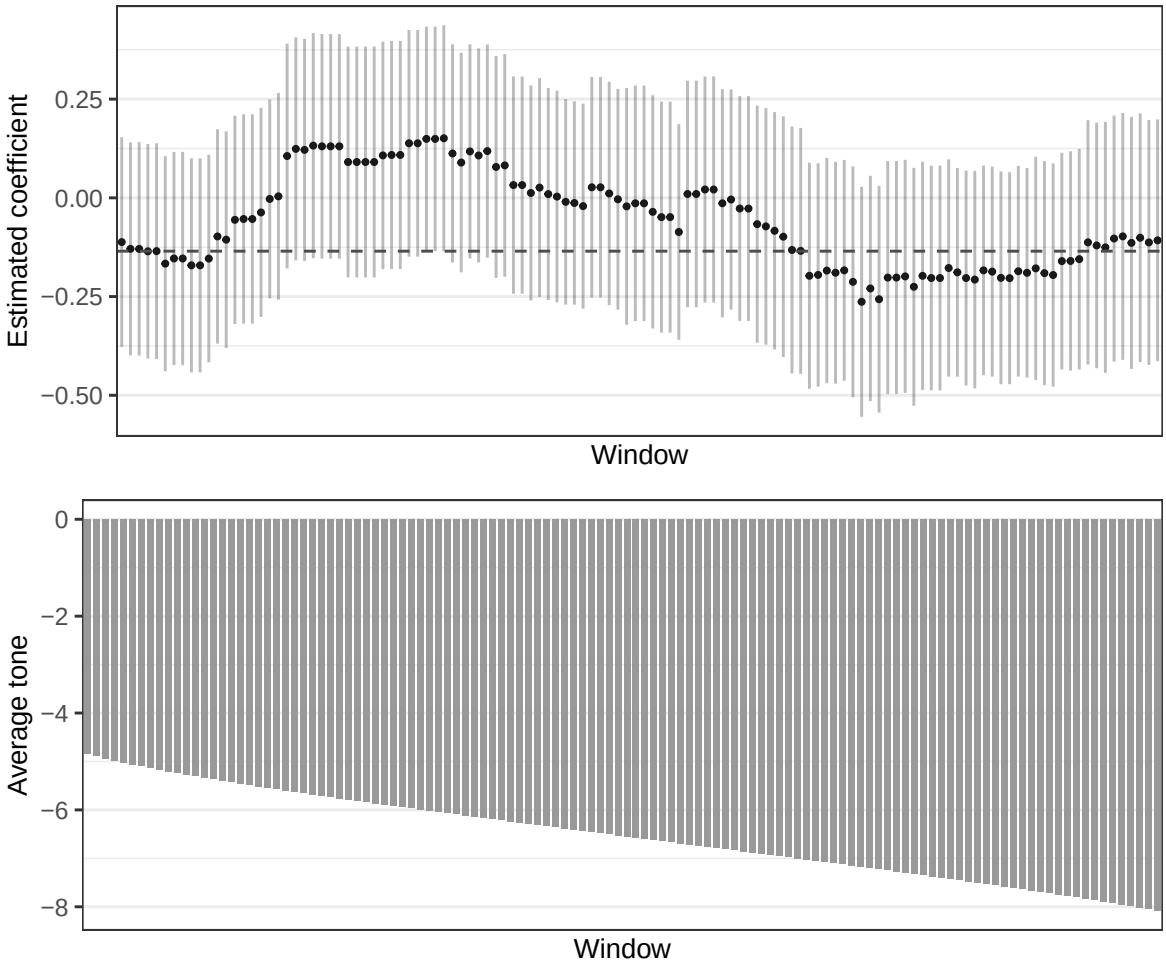
Figure B.2 presents the sensitivity analysis for GDELT data. Since the GDELT data does not have information on casualties, I use the average tone of all the documents

Figure B.1: Sliding window analysis for ACLED events. The top graph shows estimated coefficients of *CoverageFB* from the cross-sectional model with full set of controls and 95% confidence intervals. The dashed line shows the full sample estimate. The bottom graph shows the average number of casualties in each window. Each window contains 651 events.



containing mentions of the event to measure severity. Average tone can range between −100 (extremely negative) and +100 (extremely positive), with common values between −10 and +10. Events with more negative tone should be more likely to be reported regardless of cell phone coverage, which means that if reporting bias affected the results, there should be a more positive effect on events with more positive tone. Since the GDELT data is contains a much larger number of events, I conduct the sensitivity analysis in a sliding window of one third of the events ($N = 5,979$) and move the window in steps of 100 events. The estimates do not exhibit any clear dependence on severity.

Figure B.2: Sliding window analysis for GDELT events. The top graph shows estimated coefficients of *CoverageFB* from the cross-sectional model with full set of controls and 95% confidence intervals. The dashed line shows the full sample estimate. The bottom graph shows the average tone of events in each window. Each window contains 5,979 events.



2.4. Robustness

Placebo Test Table B.3 present results from a placebo regression, in which the cross-sectional model is estimated using data before the treatment period, from January 2015 to May 2016. The table also shows the baseline estimate for comparison (columns (3) and (4)), as well as estimates using data after the treatment (columns (5) and (6)).

Table B.3: Cross-sectional estimates on probability of conflict: by time period

	Pre		Treat		Post	
	(1)	(2)	(3)	(4)	(5)	(6)
CoverageFB	0.158	−0.010	−0.135	0.013	−0.026	−0.176**
	(0.122)	(0.048)	(0.129)	(0.051)	(0.152)	(0.080)
Coverage	0.092	0.020	0.187	−0.018	0.118	0.132*
	(0.142)	(0.053)	(0.118)	(0.052)	(0.152)	(0.071)
Observations	329	329	329	329	329	329
R^2	0.391	0.727	0.432	0.666	0.430	0.633
Data	GDELT	ACLED	GDELT	ACLED	GDELT	ACLED
Mean(Y)	0.688	0.191	0.642	0.17	0.588	0.233
Controls	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. The dependent variable in columns (1)–(2) is an indicator for conflict in a township between 1 January 2015 and 31 May 2016; in columns (3)–(4) between 1 June 2016 and 31 August 2017; and in columns (5)–(6) between 1 September 2017 and 31 December 2018. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

2.4.1. Count Model

Although log transforming the data already smooths the distribution of number of conflict events, the data still has a positive skew. Therefore, I also estimate a negative binomial model. The estimates are presented in Table B.4. The estimated coefficients are larger than in the OLS model in Table 2.2 in Section 2.6., but they are also quite imprecise. It is likely that the OLS estimates are attenuated because of the large number of zeros in the outcome.

2.4.2. Population Weighted Cell Phone Coverage

Cell phone coverage used in the main analysis is not weighted by population. Instead, I control for both population and population density, as they are determinants of the location

Table B.4: Estimates from negative binomial model

	Conflict events, GDELT (1)	Conflict events, ACLED (2)
CoverageFB	−0.404	−0.775
	(0.476)	(0.722)
Coverage	0.259	0.793
	(0.627)	(0.724)
Observations	329	329
Controls	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at village level are reported in parentheses. Unit of observation is village tract. The dependent variable is number of conflict events between 1 June 2016 and 31 August 2017. The number of events is capped at the 97th percentile (216 events in GDELT and 33 events in ACLED) to facilitate convergence. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

of cell phone infrastructure. However, to make sure that the results are not confounded population, I also conduct the estimation using population weighted cell phone coverage. Table B.5 present results for the dummy outcome and number of conflict events and Table B.6 present results for different types of conflict. Tables B.7 and B.8 present difference-in-differences estimates. Weighting cell phone coverage by population does not make much difference to the results, and the estimates are very similar to the ones presented in the article.

Table B.5: Cross-sectional estimates of population weighted cell phone coverage

	Conflict dummy		log(no. conflict events)	
	(1)	(2)	(3)	(4)
CoverageFB_popw	−0.153	0.030	0.054	−0.084
	(0.094)	(0.045)	(0.335)	(0.121)
Coverage_popw	0.154	−0.078*	0.121	−0.194
	(0.104)	(0.046)	(0.389)	(0.132)
Observations	329	329	329	329
R^2	0.434	0.668	0.447	0.804
Data	GDELT	ACLED	GDELT	ACLED
Controls	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. The dependent variable in columns (1)-(2) is an indicator for conflict in a township between 1 June 2016 and 31 August 2017. The dependent variable in columns (3)-(4) is logged number of conflict events+1. The coverage variables are population weighted averages. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Table B.6: Cross-sectional estimates of population weighted cell phone coverage: by type of conflict

	Coerce	Assault	Fight	Mass violence	Battle	Civilians	Explosion
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CoverageFB_popw	−0.027	−0.033	−0.177*	−0.063	−0.015	−0.029	−0.006
	(0.110)	(0.115)	(0.093)	(0.041)	(0.044)	(0.053)	(0.018)
Coverage_popw	0.104	−0.035	0.196*	−0.060	−0.065*	0.061	−0.069*
	(0.138)	(0.118)	(0.103)	(0.049)	(0.039)	(0.059)	(0.039)
Observations	329	329	329	329	329	329	329
R^2	0.388	0.411	0.479	0.401	0.736	0.594	0.751
Data	GDELT	GDELT	GDELT	GDELT	ACLED	ACLED	ACLED
Mean(Y)	0.506	0.303	0.527	0.061	0.139	0.085	0.094
Controls	✓	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. The specifications are estimated on village level data, and the number of observations refers to villages in Rakhine State. The dependent variable is an indicator for conflict of particular type in a township between 1 June 2016 and 31 August 2017. The coverage variables are population weighted averages. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Table B.7: Difference-in-differences estimates with population weighted cell phone coverage

	Conflict dummy		log(no. conflict events)	
	(1)	(2)	(3)	(4)
CoverageFB_popw	−0.018*	−0.002	−0.048**	−0.008
	(0.010)	(0.005)	(0.022)	(0.008)
Coverage_popw	−0.001	0.004	0.023	0.015*
	(0.012)	(0.005)	(0.023)	(0.008)
Observations	15792	15792	15792	15792
R^2	0.373	0.424	0.600	0.438
Data source	GDELT	ACLED	GDELT	ACLED
Township FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at township level are reported in parentheses. Unit of observation is township-month. The dependent variable in columns (1)–(2) is an indicator for conflict in a township, and in columns (3)–(4) logged number of conflict events+1. The measures of cell phone coverage are standardised. All regressions include time varying controls lagged log population, lagged log population density, lagged nighttime luminosity, and drought, and an interaction between a linear time trend and time invariant controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, share of oil fields, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Table B.8: Difference-in-differences estimates on different conflict types with population weighted cell phone coverage

	Coerce (1)	Assault (2)	Fight (3)	Mass violence (4)	Battle (5)	Civilians (6)	Explosion (7)
CoverageFB_popw	−0.014*	−0.007	−0.009	−0.004	−0.002	0.001	−0.004
	(0.009)	(0.007)	(0.009)	(0.004)	(0.004)	(0.003)	(0.003)
Treat	−0.014	0.015**	0.019**	0.007*	0.004	−0.004	0.010***
	(0.010)	(0.007)	(0.009)	(0.004)	(0.004)	(0.003)	(0.004)
Observations	15792	15792	15792	15792	15792	15792	15792
R^2	0.355	0.335	0.355	0.427	0.402	0.168	0.242
Mean(Y)	0.12	0.053	0.119		0.037		
Data	GDELT	GDELT	GDELT	GDELT	ACLED	ACLED	ACLED
Township FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at township level are reported in parentheses. Unit of observation is township-month. All regressions include township and month-year fixed effects. The measures of cell phone coverage are standardised. All regressions include time varying controls lagged log population, lagged log population density, lagged nighttime luminosity, and drought, and an interaction between a linear time trend and time invariant controls: 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, share of oil fields, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

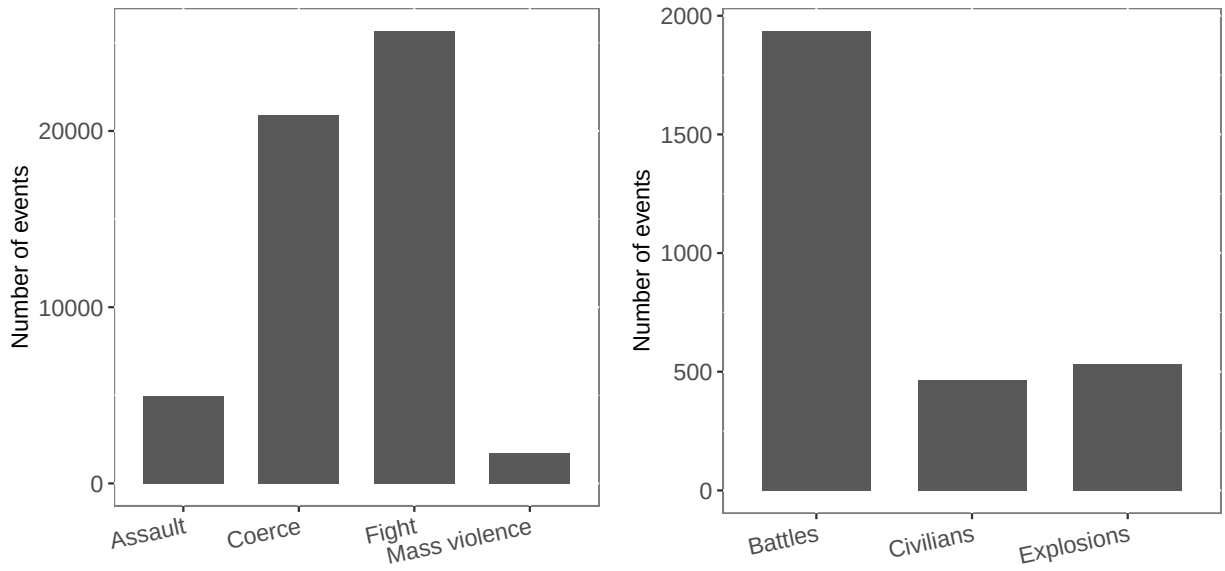
Table B.9: Cross-sectional estimates on conflict in Rakhine State with population weighted cell phone coverage

	Event dummy (1)	log(events) (2)	Coerce (3)	Assault (4)	Fight (5)	Mass violence (6)
CoverageFB_popw	0.019	0.032	0.011	0.005	0.022*	0.001
	(0.012)	(0.036)	(0.010)	(0.009)	(0.011)	(0.006)
	[0.15]	[0.217]	[0.2]	[0.478]	[0.064]	[0.465]
Coverage_popw	−0.012	−0.058**	−0.017**	−0.005	−0.013	−0.005
	(0.012)	(0.026)	(0.008)	(0.007)	(0.010)	(0.003)
Observations	1058	1058	1058	1058	1058	1058
R^2	0.093	0.080	0.066	0.043	0.081	0.061
Mean(Y)	0.035	0.022	0.015	0.028	0.006	0.08
Controls	✓	✓	✓	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at village level are reported in parentheses. The p-values for wild cluster bootstrap standard errors at the township level are reported in square brackets. The dependent variable in column (1) is an indicator for conflict event, in column (2) logged number of conflict events, and in columns (3)-(6) an indicator for a particular type of conflict event. Conflict measures are based on data from GDELT. The coverage variables are population weighted averages. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

2.5. Additional Figures

Figure B.3: Number of different conflict events by event type

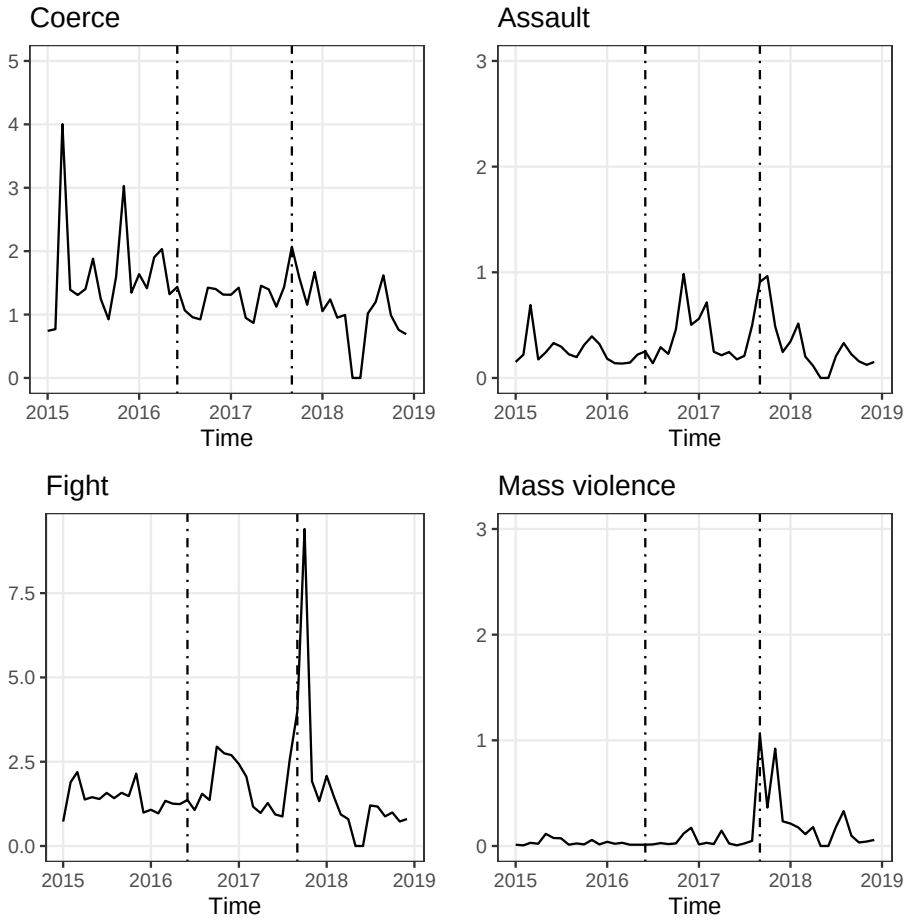


(a) Data: GDELT

(b) Data: ACLED

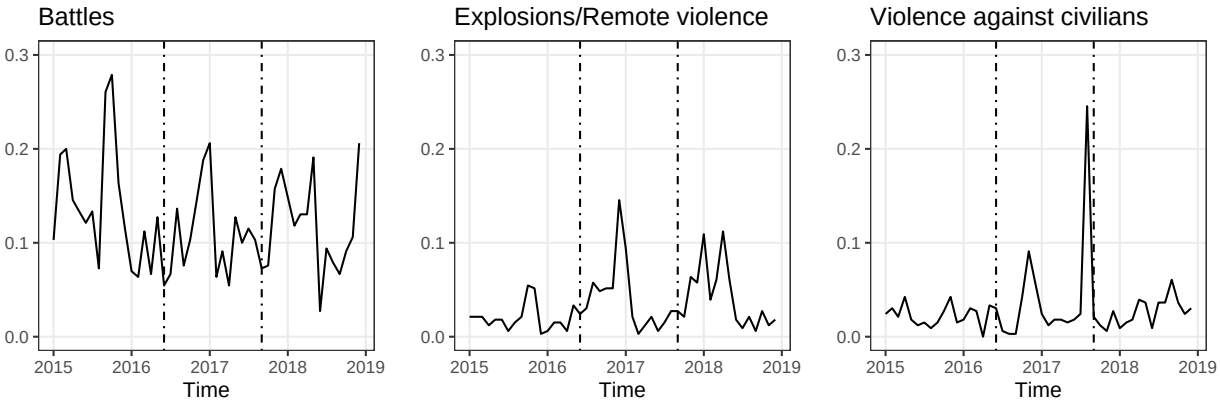
Note: The chart presents the total number of conflict events in Myanmar between January 2015 and December 2018 by event type.

Figure B.4: Number of conflict events - GDELT



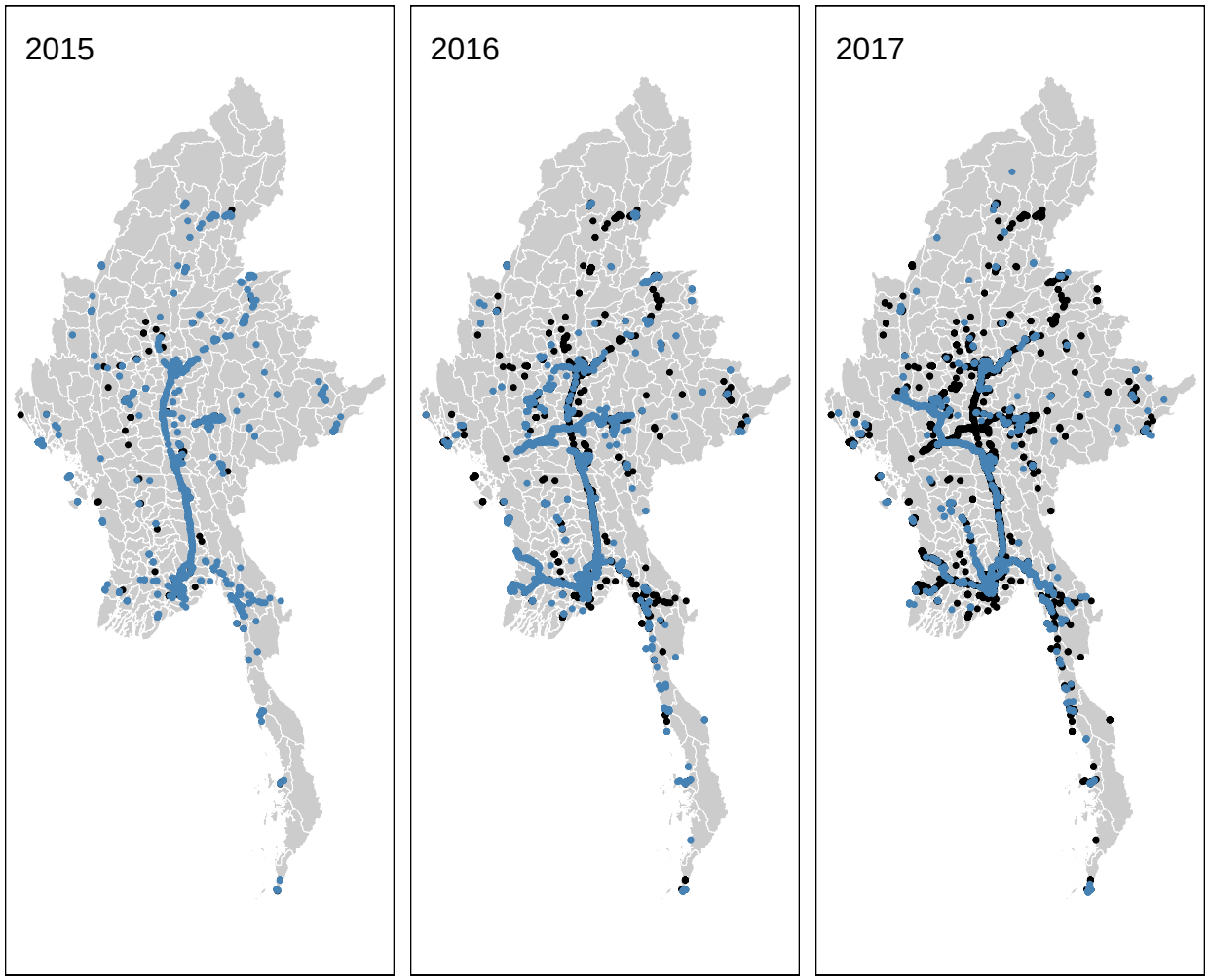
Note: The charts present average monthly numbers of conflict events across townships. Vertical dashed lines represent the the beginning (June 2016) and end (September 2017) of the Facebook campaign. Data source: GDELT

Figure B.5: Number of conflict events - ACLED



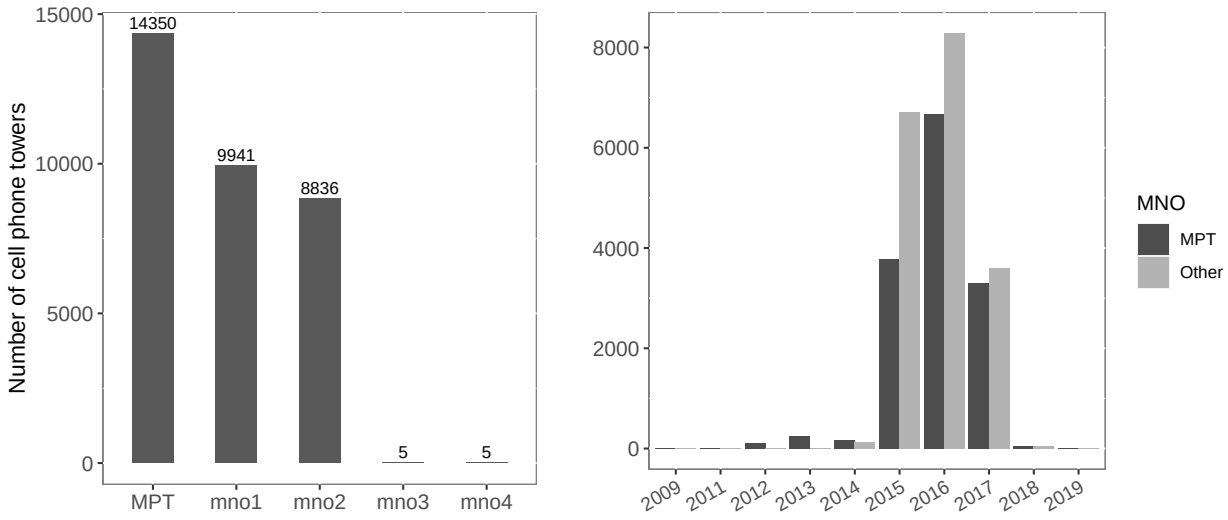
Note: The charts present average monthly numbers of conflict events across townships. Vertical dashed lines represent the the beginning (June 2016) and end (September 2017) of the Facebook campaign. Data source: ACLED

Figure B.6: Expansion of the cell tower network of MPT



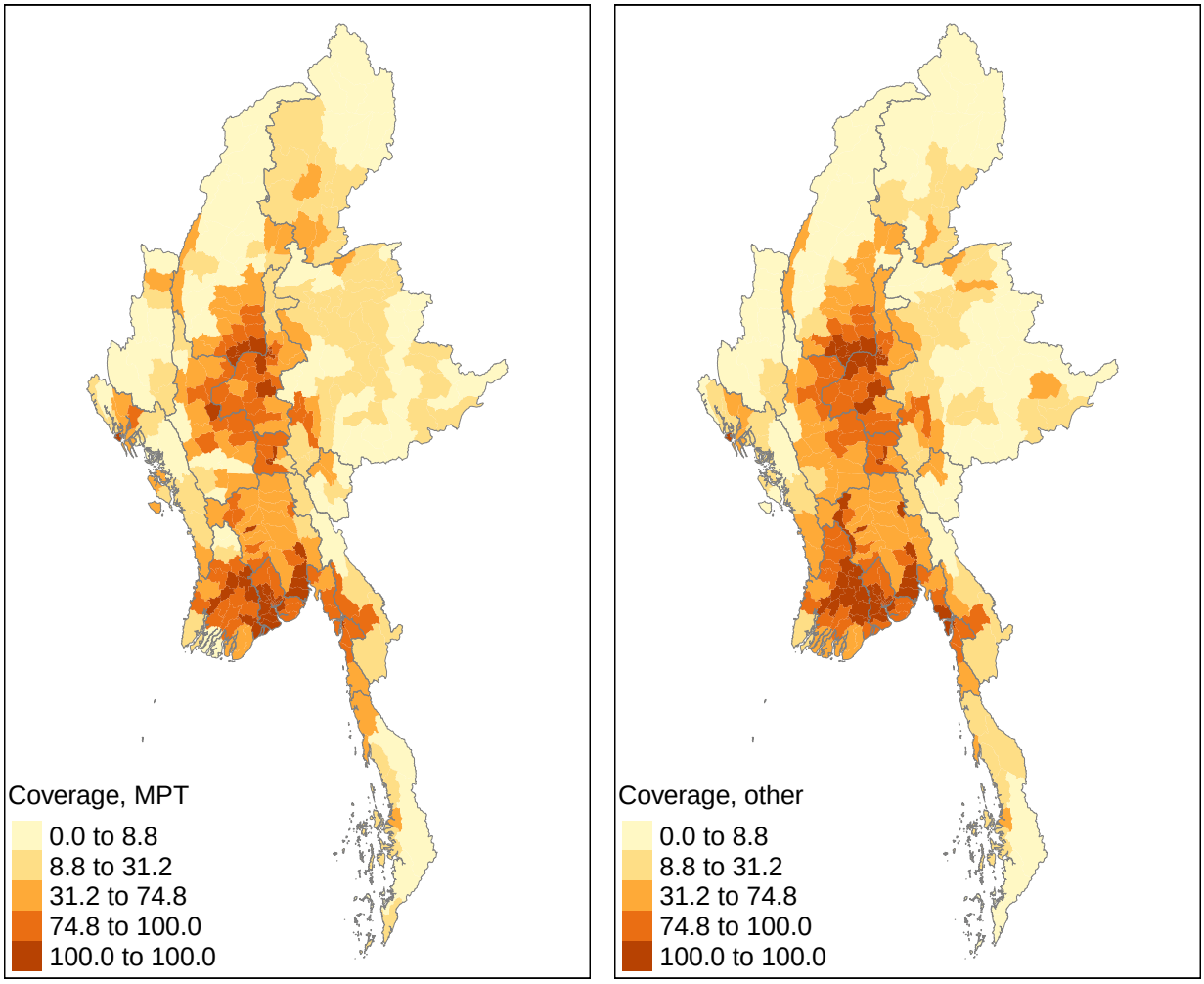
Note: Blue dots represent locations of cell phone towers that are added to the data each year, and black dots represent locations of the pre-existing cell phone towers.

Figure B.7: Cell phone towers by MNO and year



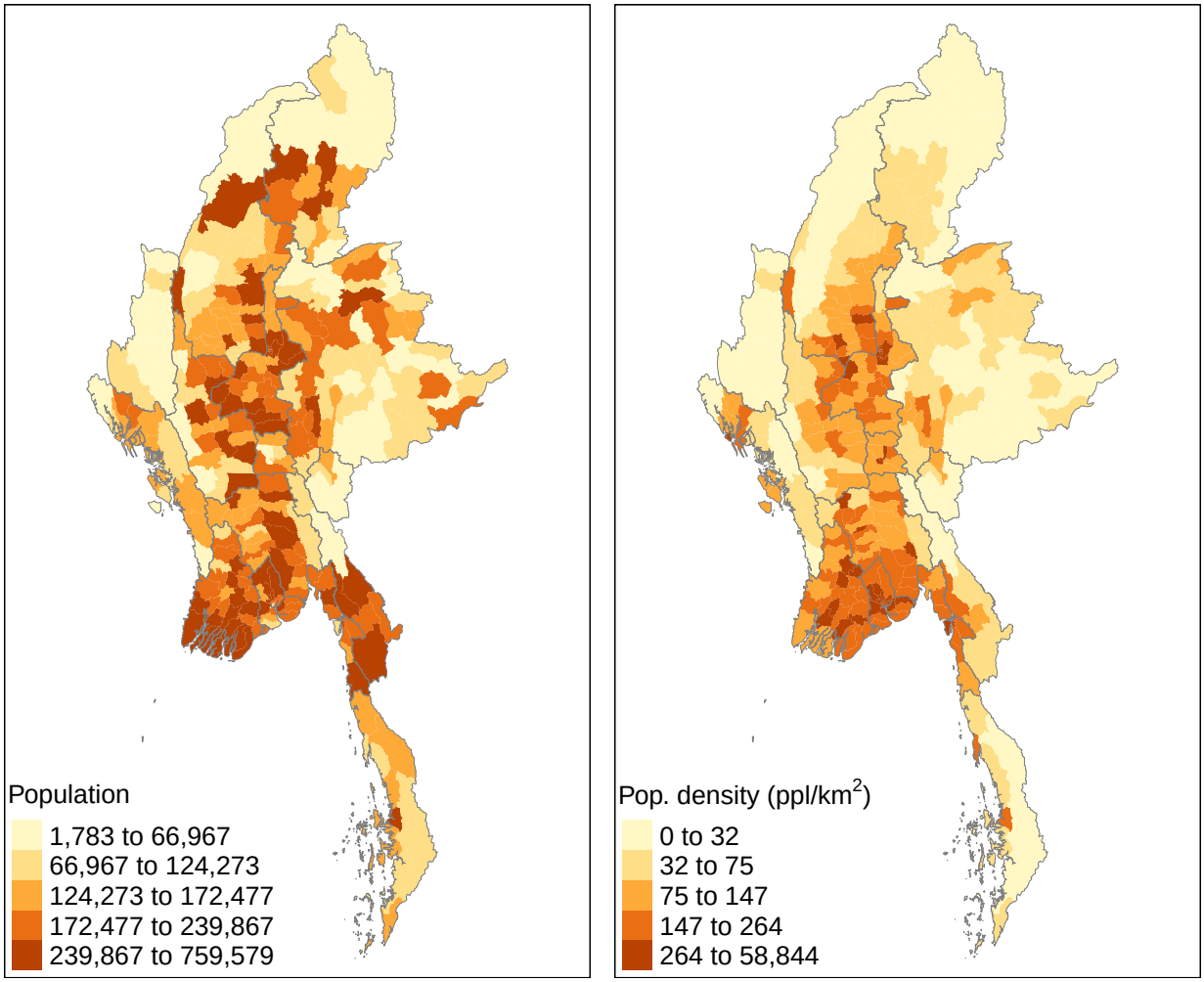
Note: Left-side panel presents the total number of cell phone towers in Myanmar by mobile network operator and right-side panel presents when cell towers were recorded in the OpenCelliD data.

Figure B.8: Predicted cell phone coverage



Note: The chart presents share of township with sufficient sufficient signal strength for cell phone reception. Left-side panel presents predicted coverage by MPT and right-side panel presents predicted coverage by other mobile network operators.

Figure B.9: Township population



Note: Population count (left) and population density (right). Calculated from WorldPop data for 2016.

2.6. Additional Tables

Table B.10: Cross-sectional estimates on destroyed villages in Rakhine State

	Affected (1)	Damaged settlements (2)	Fires (3)
CoverageFB	0.024	0.135	0.076
	(0.038)	(0.197)	(0.078)
	[0.5]	[0.75]	[0.75]
Coverage	0.045	−0.011	0.0004
	(0.036)	(0.136)	(0.051)
Observations	266	266	266
R^2	0.640	0.514	0.218
Mean(Y)	0.511	1.474	0.165
Controls	✓	✓	✓

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at village level are reported in parentheses. The p-values for wild cluster bootstrap standard errors at the township level are reported in square brackets. Unit of observation is village tract. The sample is restricted to the Buthidaung, Maungdaw and Rathedaung townships that were included in the satellite-image analysis. The dependent variable in column (1) is a dummy for any damaged settlements or fires detected in the village tract, in column (2) number of damaged settlements, and in column (3) number of fires detected in the village tract. The measures of cell phone coverage are standardised. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, lagged nighttime luminosity, share of oil fields, drought, lagged log population, lagged log population density, dummy for below median urban rate, share of working age population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Table B.11: Effect of cell phone coverage on local development

	Nightlight 2018 (1)	Population 2018 (2)	Nightlight 2017 (3)	Population 2017 (4)
CoverageFB	−0.279	0.016		
	(0.248)	(0.016)		
Coverage	0.535	−0.005		
	(0.334)	(0.019)		
CoverageFB_{2016}			−0.039	0.008
			(0.095)	(0.011)
Coverage_{2016}			0.105	0.00003
			(0.107)	(0.015)
Observations	329	329	329	329
R^2	0.960	0.997	0.975	0.997

*p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered at district level are reported in parentheses. The measures of cell phone coverage are standardised. The dependent variable in column (1) is average nighttime luminosity in 2018, in column (2) population in 2018, in column (3) average nighttime luminosity in 2017, and in column (4) population in 2017. $CoverageFB_{2016}$ and $Coverage_{2016}$ are share of township with cell phone coverage from MPT and other service providers, respectively, calculated using only cell phone towers recorded in the OpenCelliD data before June 2016. All regressions include the full set of controls: district dummies, 2nd order polynomials of distance to major town, distance to major road, distance to railway, distance to MPT transmitter, distance to other transmitter, mean elevation, mean slope, mean ruggedness, length of roads, and township area, share of agriculture land, share of forests, share of urban settlements, presence of gemstones, nighttime luminosity, share of oil fields, drought, log population, log population density, dummy for below median urban rate, share of working age (15–64 y.o.) population, share of population with no ID, share of population with electricity, mobile phone, landline phone, and internet at home.

Appendix C

Appendix to Chapter 3

3.1. Summary Statistics

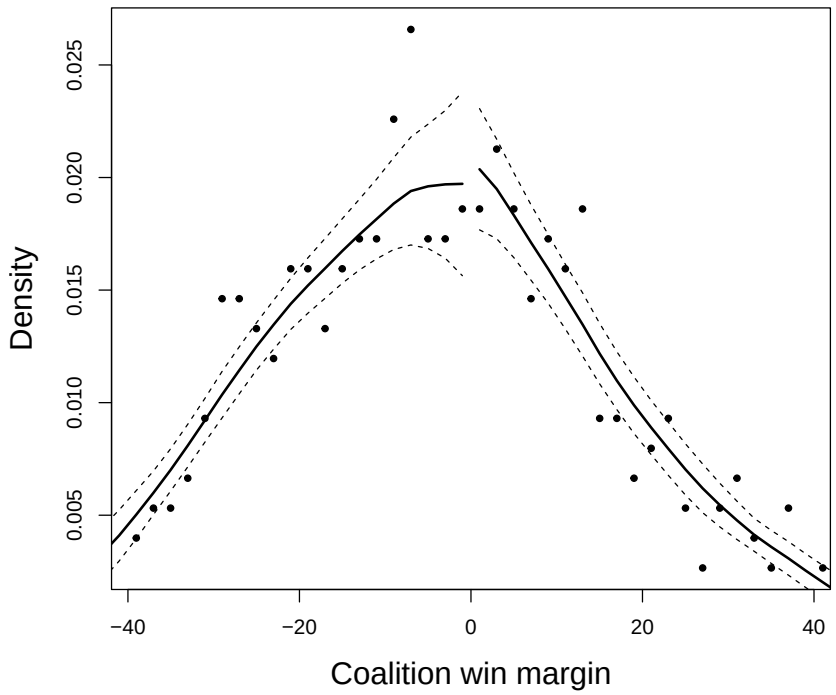
Table C.1: Summary statistics

	N	Mean	std.Dev.
JSA saction rate, %, post-reform	632	4.51	1.02
JSA sanctions	632	85.31	49.56
JSA claimants	632	1974.54	1040.84
Conservative vote share	631	35.68	14.57
Libdem vote share	631	23.18	10.44
Labour vote share	631	30.97	15.90
Conservative seat share	632	0.48	0.50
Libdem seat share	632	0.09	0.29
Labour seat share	632	0.41	0.49
Number of parties	632	5.41	0.70
Flipped seat	632	0.16	0.37
MP standing down	632	0.20	0.40
Population	632	95675.88	12309.07
Female population, %	632	50.99	0.79
Working age population, %	632	64.77	3.48
Economic activity rate, %	632	76.76	5.38
Employment rate, %	632	70.86	6.60
Unemployment rate, %	437	9.16	3.01
Median earnings	579	21660.14	3751.71

Summary statistics for UK parliamentary constituencies in England, Scotland and Wales. JSA statistics are monthly means across constituencies from January 2010 to December 2015. Post-reform JSA sanction rate refers to the period from March 2012 to December 2015. Flipped seats is share of seats where party control changed in the 2010 election. MPs standing down is share of seats where the MP did not seek re-election in 2010. Earnings is gross annual pay.

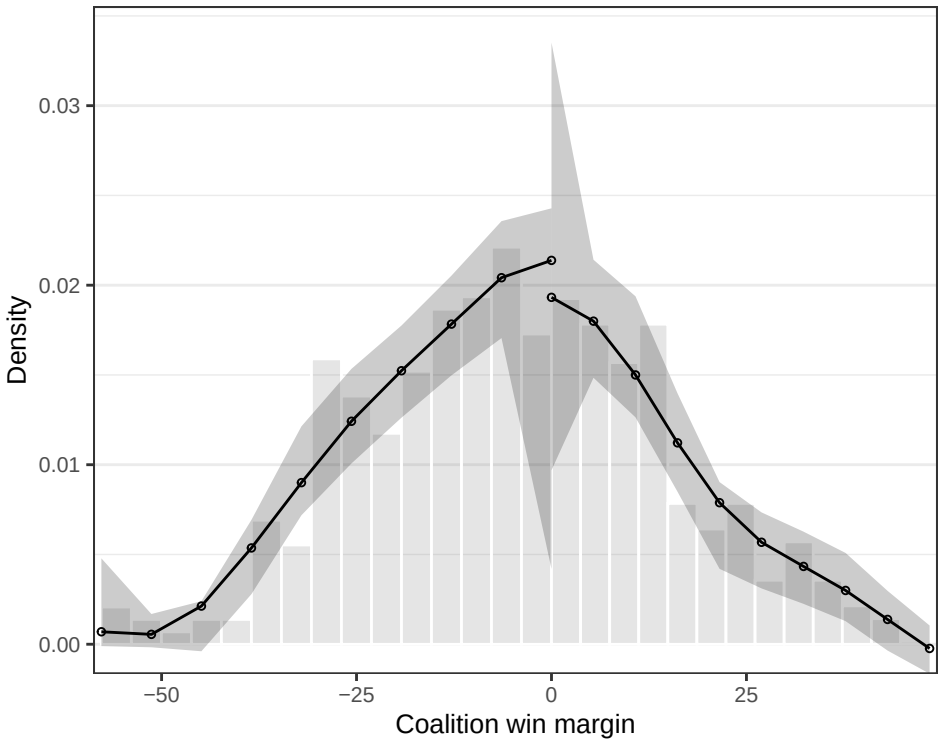
3.2. Validity and Robustness

Figure C.1: McCrary density test



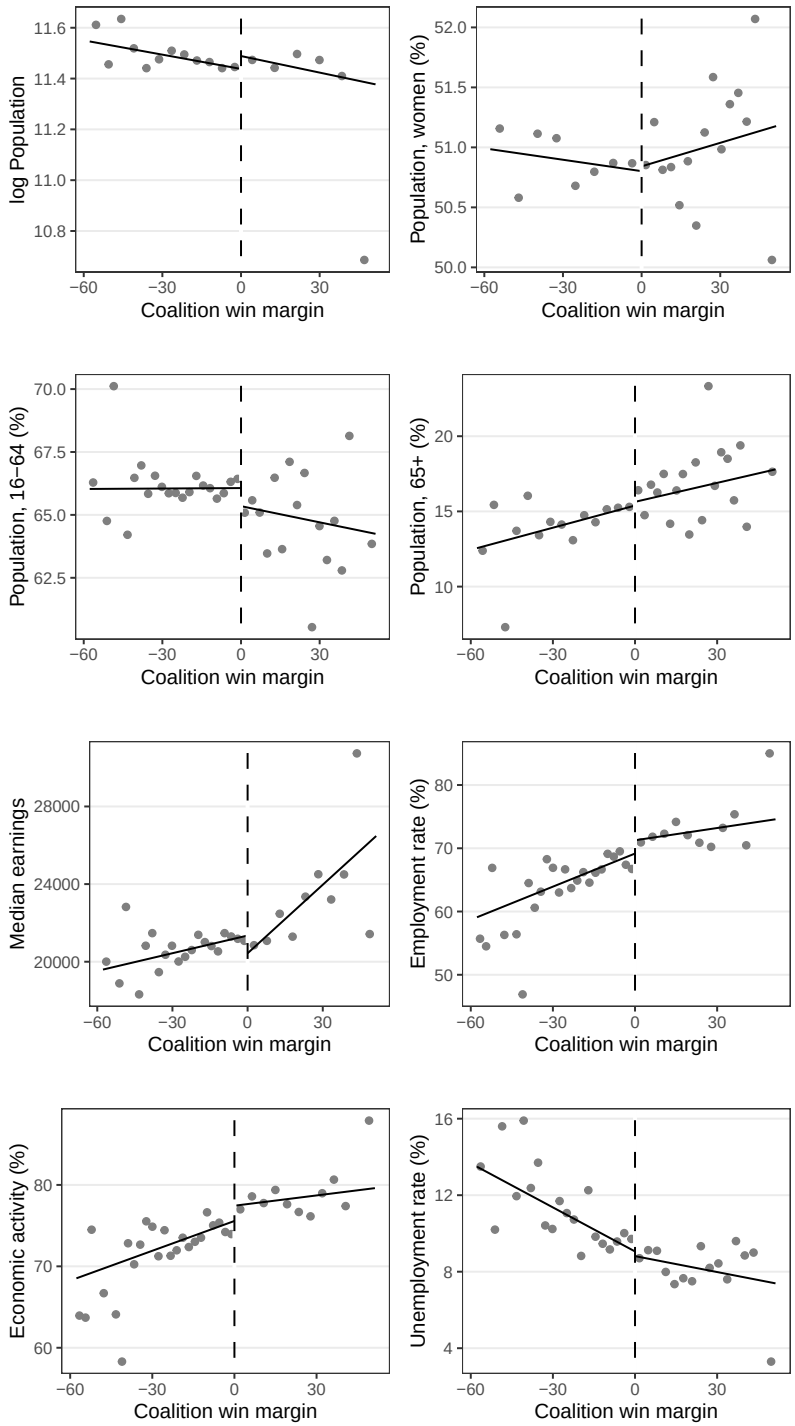
Note: Dots represent binned average outcomes and dashed lines represent the 95 % confidence intervals. Estimated log difference in heights at the cut-off is 0.05 with a standard error 0.25.

Figure C.2: Manipulation test



Note: Manipulation testing procedure proposed by Cattaneo et al. (2020). Dots represent bias-corrected estimated densities and shaded area represents the 95 % confidence intervals. The histogram represents the density of running variable, coalition vote margin to victory (ppts). Estimated difference in densities at the cut-off is 0.007 with a standard error 0.008.

Figure C.3: Balance of covariates by coalition win margin



Note: The figures present binned averages of pre-treatment covariates with linear fit lines.

Table C.2: RD estimates of Coalition win on pre-treatment covariates

	Population (1)	Women (2)	Working age (3)	Elderly (4)	Earnings (5)	Employment (6)	Activity (7)	Unemployment (8)
Coalition win	0.032	0.161	-1.204	0.679	-833.252	3.493*	2.677	-0.967
	(0.040)	(0.285)	(1.248)	(1.000)	(1005.603)	(1.959)	(1.901)	(0.852)
p-value robust	0.606	0.625	0.371	0.524	0.443	0.094	0.237	0.260
95 % CI robust	[-0.068, 0.117]	[-0.505, 0.841]	[-4.258, 1.589]	[-1.586, 3.115]	[-3243.027, 1419.928]	[-0.657, 8.431]	[-1.784, 7.224]	[-3.046, 0.823]
Bandwidth	11.88	11.52	11.91	10.26	14.62	12.51	11.83	9.74
Mean(Y)	11.46	50.99	64.77	16.5	21660.14	70.86	76.76	9.16

* p < 0.1, ** p < 0.05, *** p < 0.01

*p<0.1; **p<0.05; ***p<0.01. The dependent variable in column (1) is log population, in column (2) share of women, in column (3) share of working age population, in column (4) share of population over the age of 65, in column (5) gross annual median earnings, in column (6) employment rate, in column (7) economic activity rate, and in column (8) unemployment rate. Estimates from local linear regressions calculated within optimal Calonico et al. (2014) bandwidths and using a triangular kernel. Robust standard errors in parentheses. Mean(Y) is unconditional sample average.

Table C.3: RD estimates of Coalition win on pre-treatment economic activity rates

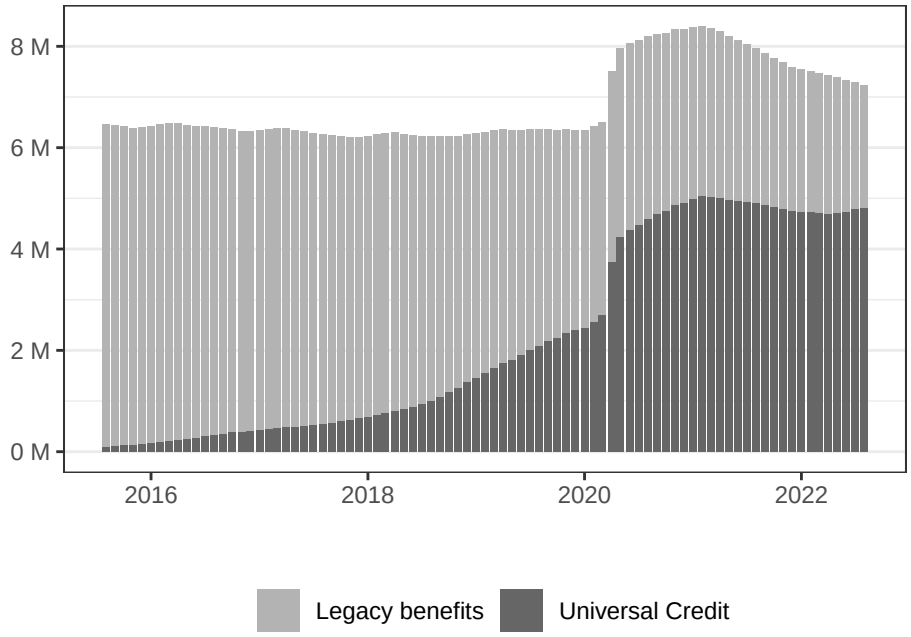
	October 2008-September 2009			April 2009-March 2010		
	Employment (1)	Activity (2)	Unemployment (3)	Employment (4)	Activity (5)	Unemployment (6)
Coalition win	2.718	2.298	-0.292	2.962	2.010	-1.051
	(1.998)	(1.823)	(1.119)	(1.844)	(1.821)	(1.167)
p-value robust	0.196	0.286	0.738	0.150	0.425	0.304
95 % CI robust	[-1.593, 7.765]	[-1.963, 6.643]	[-3.027, 2.145]	[-1.158, 7.575]	[-2.584, 6.128]	[-4.028, 1.256]
Bandwidth	12.78	11.67	11.36	15.08	13.31	10.69
Mean(Y)	71.19	76.85	8.8	70.46	76.5	9.34

* p < 0.1, ** p < 0.05, *** p < 0.01

*p<0.1; **p<0.05; ***p<0.01. The dependent variable in columns (1) and (4) is employment rate (%), in columns (2) and (5) economic activity rate (%), and in columns (3) and (6) unemployment rate (%). Estimates from local linear regressions calculated within optimal Calonico et al. (2014) bandwidths and using a triangular kernel. Robust standard errors in parentheses. Mean(Y) is unconditional sample average.

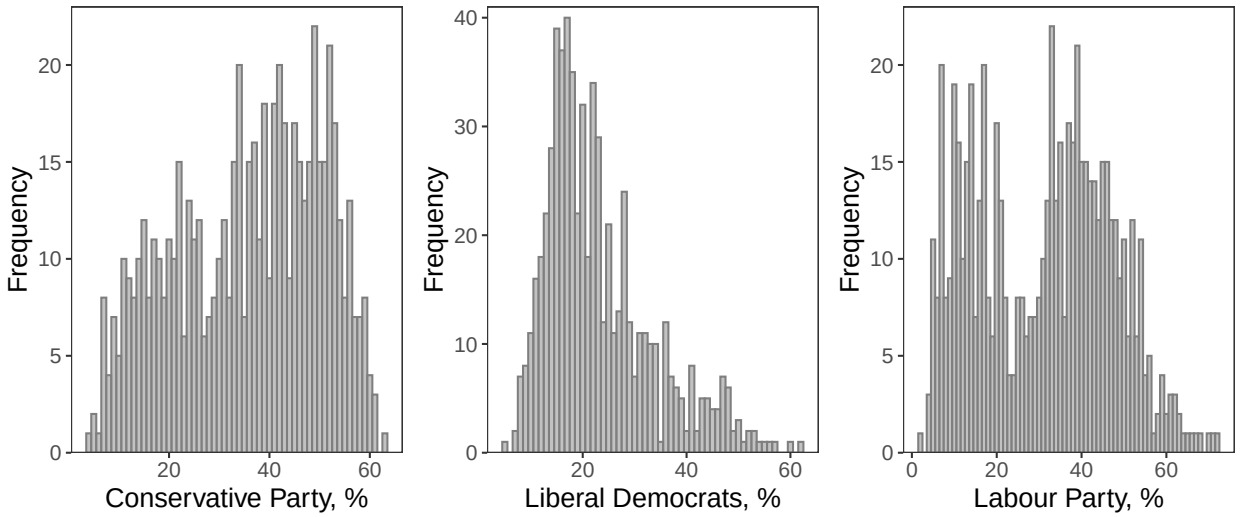
3.3. Additional Figures

Figure C.4: Number of households on Universal Credit and on legacy benefits



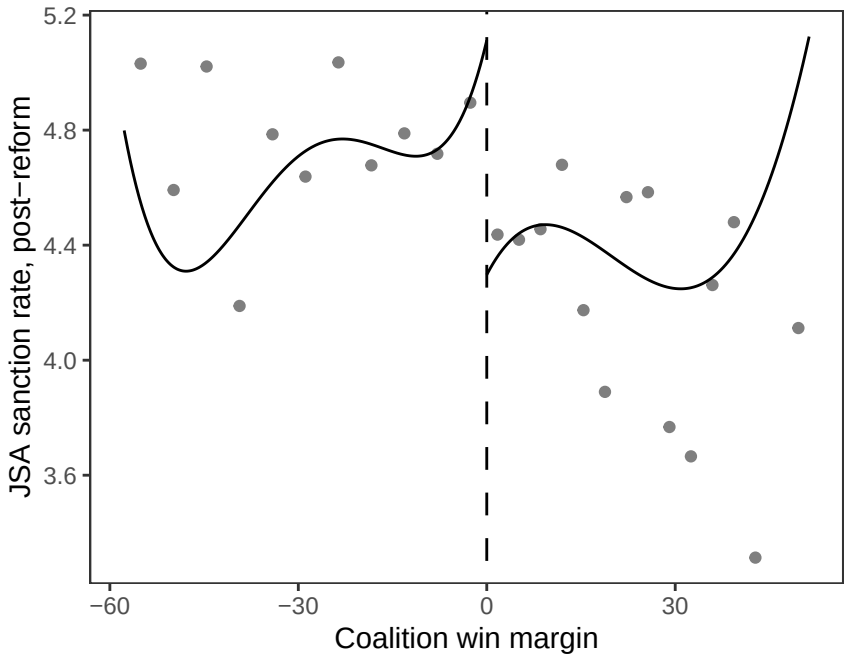
Note: Data obtained from House of Commons Library. Numbers on households in England, Scotland and Wales.

Figure C.5: Frequency of observations by vote shares



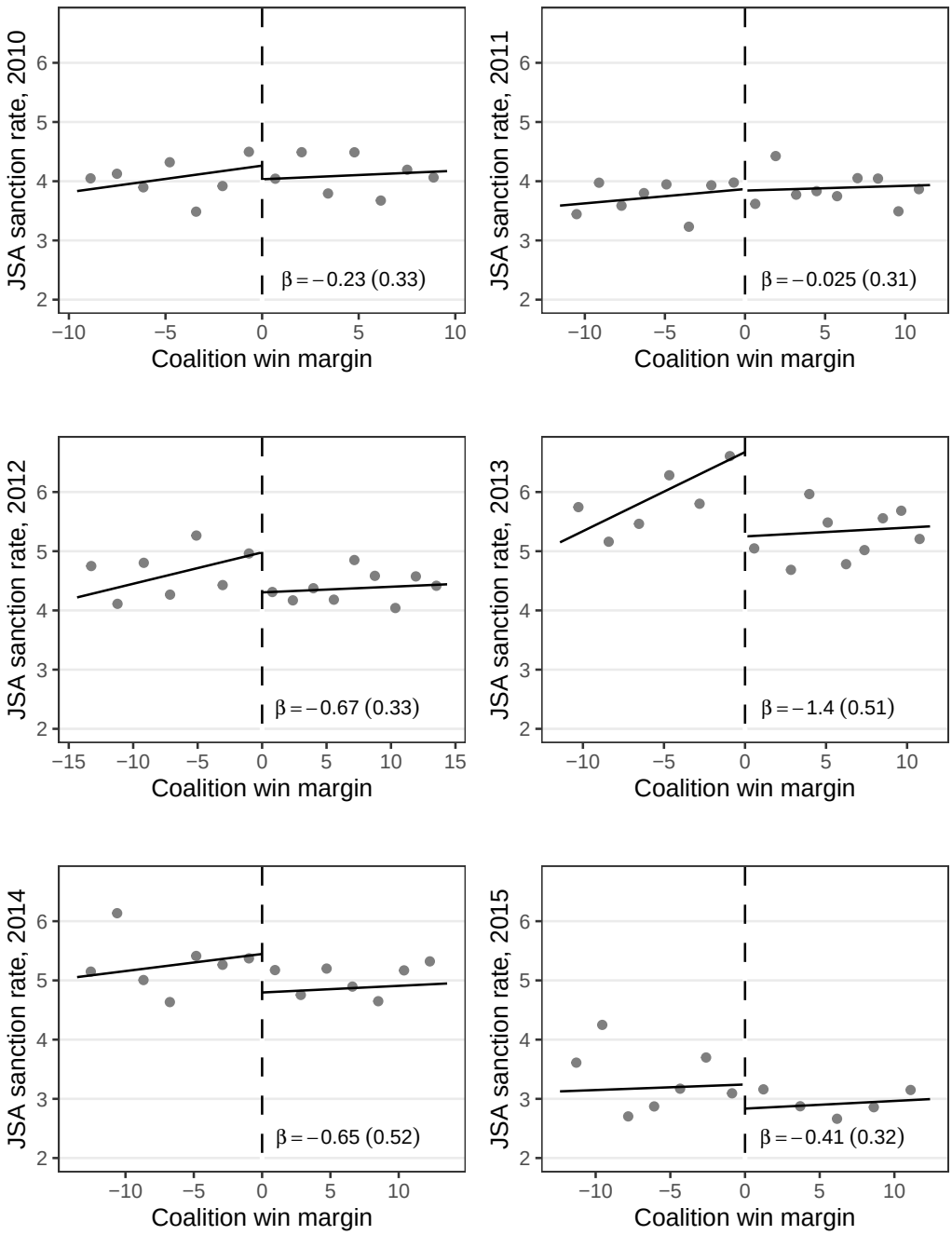
Note: Vote shares of Conservative, Liberal Democratic and Labour Party in UK 2010 general election in England, Scotland and Wales.

Figure C.6: Regression discontinuity plot - global polynomial fit



Note: The figure presents a fourth-order global polynomial regression discontinuity fit on each side of the electoral cut-off. Dots are binned average sanction rates over the post-reform period from March 2012 to December 2015

Figure C.7: Effect of a coalition party winning a set on JSA sanction rate, estimates by year.



Note: The figures present binned averages of JSA sanction rates over the post-reform period from March 2012 to December 2015 and fit lines from a linear RD specification with demographic and socioeconomic controls and using the optimal bandwidth and triangular kernel. β is the RD estimate. Robust standard errors in parentheses.

3.4. Additional Tables

Table C.4: RD estimates of Coalition win on JSA sanction rate by year

	2010 (1)	2011 (2)	2012 (3)	2013 (4)	2014 (5)	2015 (6)
Coalition win	-0.230	-0.025	-0.675**	-1.424***	-0.650	-0.407
	(0.329)	(0.311)	(0.330)	(0.505)	(0.523)	(0.317)
p-value robust	0.370	0.801	0.046	0.005	0.228	0.253
95 % CI robust	[-1.07, 0.398]	[-0.806, 0.622]	[-1.505, -0.015]	[-2.713, -0.471]	[-1.99, 0.475]	[-1.188, 0.313]
Bandwidth	9.58	11.55	14.35	11.41	13.54	12.39
Controls	✓	✓	✓	✓	✓	✓
Mean(Y)	3.88	3.65	4.34	5.43	4.96	3.14

* p < 0.1, ** p < 0.05, *** p < 0.01

*p<0.1; **p<0.05; ***p<0.01. The dependent variable is JSA sanction rate in a given year. The table reports both conventional and bias-corrected estimates from local linear RD specifications. All regressions use the optimal Calonico et al. (2014) bandwidths and a triangular kernel. Controls include log population, share of women, share of working age, median earnings, and employment rate. Robust standard errors in parentheses. Mean(Y) is an unconditional sample average.

Table C.5: RD estimates of alternative races on JSA sanction rate

	Coalition-Labour (1)	Coalition-Opposition (2)	Conservative-Labour (3)	Lib Dem-Labour (4)
RD estimate	-0.800**	-0.780**	-1.089**	-0.681
	(0.345)	(0.338)	(0.440)	(0.684)
p-value robust	0.025	0.028	0.019	0.371
95 % CI robust	[-1.682, -0.113]	[-1.636, -0.093]	[-2.243, -0.205]	[-2.645, 0.988]
Bandwidth	12.80	13.30	10.69	5.57
Controls	✓	✓	✓	✓

* p < 0.1, ** p < 0.05, *** p < 0.01

*p<0.1; **p<0.05; ***p<0.01. The dependent variable is JSA sanction rate in the post-reform period from March 2012 to December 2015. The table reports both conventional and bias-corrected estimates from local linear RD specifications. All regressions use the optimal Calonico et al. (2014) bandwidths and a triangular kernel. Robust standard errors in parentheses. Controls include log population, share of women, share of working age, median earnings, and employment rate.