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DOCTORAL THESIS

Electoral geography and political transformations: the rise of populist parties and its determinants

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"Athenian democracy lasted for about two centuries. Romans ruled themselves for nearly five hundred years. The Republic of Venice remained serene for over a millennium. Anybody who predicted the demise of these polities in their later years could easily have been mocked. Why, they might have been asked by their contemporaries, should a system that has survived for hundreds of years collapse in the next fifty? And yet, there did come a moment in which Athenian democracy, self-government in Rome, and even the Republic of Venice left the stage of history.
We would do well to take this lesson to heart."

Yascha Mounk

The People vs. Democracy. Why Our Freedom Is in Danger and How to Save It. Harvard University Press. 2018

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Contents

Introduction

Electoral geography looks into the voting dynamics across space, considering how the social and economic context evolves. Being at the intersection between politics and geography, it allows the quantitative approach and social theory to meet, with the great potential to unveil new insights about what causes and affects people's voting behaviour. This thesis enters the electoral geography field moved by the will to understand and disclose the reasons behind the recent political transformations.

The last decade has witnessed a political shift in voters' preferences. The upsurge of populist parties has involved countries in the whole world. We focus the attention on the European context, in a moment in history when all regions are experiencing "a combination of job loss, declining labour-force participation or declining per-capita income relative to national averages" (Martin et al., 2018:9). At this very moment, a collapse of citizens' support towards social and democratic parties occurs and a number of populist parties emerge, re-addressing the politics' concerns on people's needs and demands.

Going beyond the merely descriptive voting patterns, the ambition is to design different empirical scenarios where multiple forces and factors move together, and shed light on the mechanisms at play. In pursuing this objective, the thesis fully dives into the *geography of discontent* literature, investigating the mechanisms behind the populist outbreak and its geographic heterogeneity.

In the attempt to reach its scope, this work, made up of four chapters, places the emphasis at the local level, where people make direct experiences with the institutional, social and economic realities, and hence, shape their political beliefs. Furthermore, the first fundamental contribution is represented by the construction of two novel datasets. One dataset gathers the national parliamentary election results, collected from each national source, for each party. It covers 208 European regions across 28 European countries, for the 2011-2019 time-span. After complementing it with economic, demographic and institutional variables, this dataset is used for the descriptive

analysis made in Chapter 1 and for the empirical works conducted in Chapters 2 and 3. The second dataset collects the results of the national and European elections registered by each party, from 2004 to 2019, in the 7914 Italian municipalities. The dataset, enriched with demographic, economic, historical and earthquake-related variables, is employed for the empirical analysis reported in Chapter 4.

Each chapter contributes to the thesis in the following manner:

- Chapter 1 draws the frame in which we embed the empirical works. Being the first part of the thesis, it introduces the origin and evolution of the word *populism* and its definition. Once clarified the ideology and views of populist parties, we review the major academic studies, disentangling the predominant drivers that motivate people to vote for populist parties. Before turning to the empirical chapters, in the last section we also offer a first overview, which maps and describes anti-establishment parties in Europe. This last section is an excerpt of a published article co-authored with Dr. Nicola Pontarollo.

- Chapter 2 explores the role of regional institutional quality in shaping people's political preferences in European regions. This chapter highlights the fundamental role of sub-national institutions in re-addressing political preferences, by implementing a traditional methodological approach, i.e. OLS and IV. So far, the literature still lacks a complete overview of the role of institutions, more specifically at the regional level.

- Chapter 3 extends the previous chapter's contribution, by enriching the analysis via the adoption of a recent methodological tool, i.e. the Geographically Weighted Regression (GWR). The GWR will support the analysis implemented in Chapter 2, providing deeper insights on the findings, and shedding light on the spatial heterogeneity of the effects. Falling into the same empirical setting, Chapters 2 and 3 outline the second part of the thesis.

- Chapter 4 shapes the last part of the work, turning the attention to the Italian context. Implementing a municipal-level analysis, it investigates the role of natural disasters, such as earthquakes, in shifting political preferences. While the literature has affirmed the impact of long-term decline as one of the primary causes of discontent, no one, to the best of our knowledge, has yet considered the role of short-term shocks in shaping this geography.

Chapter 2 and Chapter 3 analyse the European context at the regional level, and they are the result of a collaboration with Dr. Nicola Pontarollo, from the University of Brescia. Chapter 4 investigates the Italian context, through a municipal-level analysis, and it comes out of a collaboration with Dr. Augusto Cerqua and Dr. Marco Letta, from Sapienza University of Rome.

Dr. A. Cerqua and Dr. N. Pontarollo have supervised the entire thesis.

Part I

1 The populist outbreak in Europe

Chapter 1 sheds light on the definition of populism and its multiple facets. It gives an overview of the main academic studies investigating the determinants behind the recent shift in political preferences, and finally, it shows the territorial dynamics of the main populist parties in Europe.

1.1 The roots of populism and its definition

The dispute on the definition of *populism* is endless. The meaning and the interpretation of this word has changed through generations and has been widely discussed, coming back to life in the last years as a "new populism" or "populism 2.0" (Revelli, 2017). However, the first manifestation of populism dates back to the late 19th century, when the American People's Party started claiming attention for people's needs. Although it did not survive long, it laid the foundations for the populist ideology in both American and European political context (Judis, 2016). Shils, 1956 and Wiles, 1969 are among the first scholars who started studying populist movements. The emerging features were a nostalgic sentiment recalling old traditions and habits, a dominant figure of the leader and an anti-establishment attitude (Wiles, 1969). The debate on populism intensified in the late 50s, as a social and political matter, to distinguish between the political class and the elite from the middle class (Gellner et al., 1969). A wave of "winter discontent" arrived in Europe right after the economic downturn in the late 70s and also in 1989, when German citizens started a reaction against the communist regime, claiming "We are the people" (Judis, 2016:66; Mounk, 2018). These facts led many scholars to dig into the populist ideology and understand the reasons behind its rise. Although both left-wing and right-wing parties have been defined as populist, most scholars believed they were coming primarily from the radical right (Mudde, 2010).

Definitions ranged from being a style or rhetoric (Jagers and Walgrave,

2007), a strategy to gain consensus (Betz, 2002) or a political ideology (Freeden, 1998; Stanley, 2008). Analysing political manifestos and public speeches, some common traits emerged, helping the identification of populist parties. The seminal work of Mudde (Mudde, 2004) clarifies it is a "thin-centred ideology", which cannot be contained into a single definition. However, some core arguments emerge: the contrast between the *pure* people and the *corrupt* elite and the need to change things and restore people's sovereignty (Acemoglu et al., 2013; Van Kessel, 2015; Judis, 2016). Further studies have come out in the latest years, outlining the distinction between right-wing and left-wing populist parties based on which societal cleavage the party or the leader's party hinges the political campaign. Right-wing populist parties usually have nationalist views on immigration, globalisation and cooperation (Colantone and Stanig, 2019). Left-wing populist parties, instead, focus on income and wealth claims (Rodrik, 2018). Such diversity makes it hard to define the boundaries of populism and illustrates how blurry the ideology is. While these aspects pertain to what can be considered as the *supply* side of populism, Guiso et al., 2019 and Revelli, 2017 define the *demand* side of populism a lack of representative democracy and a widespread feeling of disappointment: when traditional parties fail in representing people's needs and in dealing with external phenomena (i.e. economic crisis, migration, globalisation), people react voting for populist parties. These parties, in contrast to the traditional ones, easily promise security, identity and power to the people (Albertazzi and McDonnell, 2007). Mudde, 2010 disaggregates the primary definition into three main features: *nativism*, *authoritarianism*, and *populism*. Nativism is understood as a mix of anti-immigrant and nationalist values, aiming at protecting the native group's basic features. Authoritarianism entails the use of strict laws and police to guarantee order and discipline in society. Populism, as already stated, recalls the representation of the people's wills. This definition is in line with Norris and Inglehart, 2019 work in classifying parties, which refer to a combination of authoritarian and traditional values (i.e. security and group conformity) and the group leader's protection, to which people express pure loyalty.

In Europe, most of these features concern right-wing parties, mainly for their criticism towards the establishment, often translated in Euroscepticism, nationalist and traditionalist ideas (Golder, 2016). Some examples are the Austrian Freedom Party (FPÖ), the Flemish Interest (VB), the Alternative for Germany (AfD), the French Rassemblement National, the Hungarian Fidesz,

or the UK Independence Party (UKIP) in the United Kingdom. In Italy, we can recognise several populist parties, starting from the end of the 90s and the beginning of 2000 (Tarchi, 2007). A well-known Italian populist party is Come on Italy (Forza Italia) guided by Silvio Berlusconi. It led the government for many years, characterised by the party leader's decisive role and the core claim of the need for a new start (Raniolo, 2006; Van Kessel, 2015; Revelli, 2017). In the same period, the regionalist populist party Northern League (Lega Nord) started to gain success, claiming regional autonomy and a conservative and mainly anti-immigrant ideology (Van Kessel, 2015). In more recent years, we have seen the evolution of the Northern League becoming the League (Lega) and guided by Matteo Salvini, who transformed a regional movement into an Italian representative party, claiming people's sovereignty. In 2009, there has been the entrance of a new political actor, the Five Star Movement (Movimento Cinque Stelle), with a new populism radically against the establishment and the elites. It gained soon significant support from the citizens, registering a high percentage of votes in 2013 and becoming the first party in the 2018 elections. Brothers of Italy (Fratelli d'Italia) is another radical right-wing party, born from the previous National Alliance (Alleanza Nazionale), which focuses on anti-immigrant and conservative policies and registered a high consensus in the latest years .

In their review on the political economy of populism, Guriev and Papaioannou, 2020 summarise the core features of modern populism, based on the existing literature. Stated that there is no common ideology, anti-elite and anti-science sentiments prevail, as well as the anti-globalisation and anti-European ones. They mostly show anti-pluralist and authoritarian positions, together with a simple and aggressive communication language. Nowadays, the use of web platforms and social media is essential when referring to populist parties. Their use has changed and enhanced parties' communication and expression tools. Though it still seems a fuzzy word, including both protest behaviours and political ideologies (Revelli, 2017), many empirical studies came out, shedding light on the mechanisms behind the rise of populist parties.

1.2 Literature review on political discontent

Philipp McCann firstly used the term *geography of discontent* in 2016 in OECD meetings, when referring to the Brexit referendum results. Soon, it became

a widely used term in the academic literature when discussing the factors responsible for the population's grievances against traditional parties and institutions (Los et al., 2017; McCann, 2020; Dijkstra et al., 2020). Since the recent election results in Europe showed an increasing consensus of anti-establishment parties, a strand of literature investigating the determinants behind is flourishing. The main drivers proposed by academia concerns economic and cultural factors.

First and foremost, *globalization*. In many local economies, exposure to global markets spurred unemployment, fuelling political reactions to return to the previous status quo (McCann, 2020). This gave populist parties the chance to blame those social classes benefitting from globalisation (Pastor and Veronesi, 2018; Guriev and Papaioannou, 2020). Colantone and Stanig, 2019 demonstrate how exposure to the China market brought about increasing consensus towards nationalist and far-right parties in Western Europe. A similar pattern is found by Barone and Kreuter, 2020 for Italy. Therefore, globalisation, or "hyperglobalization" (Rodrik, 2020), generated domestic disintegration and exacerbated localised economic distress, entailing the "revenge of the places that don't matter" (Rodrıguez-Pose, 2018). These areas once were flourishing industrial districts and fertile economic areas, experiencing long periods of economic stagnation and loss of jobs for several decades. People living there express their feelings of resentment and grievances in the ballot box, supporting anti-establishment parties. The analysis conducted by Dijkstra et al., 2020 confirms the role of *long-term decline* and introduces geographical factors' relevance. Indeed, discontent is coming from declining places and from those where people used to live in a more prosperous time and that are now feeling left behind by the institutions. Anti-establishment parties started addressing these areas' needs, answering to their claims and rising, in turn, their electoral consensus (Essletzbichler et al., 2018; Dijkstra et al., 2020).

Economic determinants such as crisis-driven economic insecurity, unemployment and inequality have been analysed and considered critical drivers for triggering political dissatisfaction. Political and economic crises may offer fertile grounds for the populist parties' climb (Caiani and Graziano, 2019). Many scholars agree that adverse economic shocks like the 2008 financial crisis have worsened the cultural cleavages and triggered political polarisation, with a shift towards populist parties. The Great Recession could have helped

anti-establishment parties to gain support in several ways: by blaming incumbent governments, ruled by moderate or traditional parties; by blaming the government and supranational institutions for austerity measures; and by embracing people's discontents using anti-European, anti-globalisation and anti-elite discourses (Mian et al., 2014;Rodrik, 2018; Guriev and Papaioannou, 2020). Algan et al., 2017 analyse the role of the economic crisis in European countries and find a positive link between unemployment and vote for anti-establishment parties. The same is found between regional European employment and anti-European vote by Lechler, 2019. Guiso et al., 2019 confirm the relevance of economic insecurity, together with globalisation, in shaping populist political preferences.

Some academic studies also tried to quantify the role of *austerity* measures and EU interventions in enhancing grievances among the electorate. Fetzer, 2019 makes austerity a vital driver of the Leave results in the EU Referendum in the United Kingdom. He finds that support for UKIP rose mostly in those districts experiencing benefit cuts and therefore motivated to react against these measures, in the ballot box. Other studies find that many rich northern countries felt threatened by the EU measures adopted to tackle the debt and economic crisis, spreading a generalised trend of distrust towards traditional and pro-Europe parties, both from the right and left sides (Algan et al., 2017; Guiso et al., 2019; Colantone and Stanig, 2019).

Territorial and interpersonal inequalities, deriving from the economic sphere, are playing a fundamental role in driving support towards populist, nationalist and authoritarian parties (Putnam et al., 2000; Lee et al., 2020). However, economic events may often not be enough to explain, from a quantitative point of view, the impact they have on people's attitudes and political preferences (Margalit, 2019). What emerges is the need to involve also social and cultural features to understand how people's feelings of discontent develop.

The work of Inglehart and Norris, 2016 gives essential insights on the channels through which both economic and cultural features determine populist vote in Western countries. On one side, they consider economic insecurity given by technological innovation, rising inequalities, and unemployment to explain people's resentment. On the other side, they also introduce a *cultural backlash theory*, focusing on educational, social and cultural aspects. In recent years, in the so-called "post-materialist" era, there has been

a cultural shift towards more progressive values such as gender equality, multiculturalism, human and civil rights, environmental protection, especially in the most educated and wealthiest communities. This transformation brought about a counter-revolution from older generations, who started feeling threatened by the new progressive values. Using the European Social Survey, Inglehart and Norris, 2016 confirm that cultural values combined with demographic and social control variables are good predictors of the support for populist parties, interpreted as a reaction against the rapid cultural changes occurring in society. This theory helps to understand why more prosperous and more resilient countries witnessed a shift in political preferences, highlighting that, alongside economic factors, there are also social and cultural issues in play.

Individual characteristics such as education, income and age are crucial in explaining anti-elite political preferences. Los et al., 2017 find that older people, low educated and with low income voted for Leave in the 2016 UK Referendum. Becker et al., 2017, Essletzbichler et al., 2018, Gordon, 2018 confirm the role played by socio-economic characteristics in shaping this kind of relationship. When considering *population density* and rurality, studies show how areas with low population density or more isolated from the city have attracted anti-establishment ideologies (Rodden, 2016; Lee et al., 2020).

Finally, *anti-immigration feelings* are also among the individual-specific factors contributing to the rise of discontent, involving feelings of fear for the identity and traditional values (Hobolt, 2016; Ford and Goodwin, 2017; Margalit, 2019). On one side, Barone et al., 2016 find that Berlusconi's Party (Forza Italia) gained more support in regions with higher migration flows. On the other side, Colantone and Stanig, 2016 and Alabrese et al., 2019 reveal an opposite pattern between EU immigration and Leave vote for the UK referendum. Results on the role of immigration are therefore still mixed and inconclusive. In the Italian context, a recent study on the drivers of local discontent (Di Matteo and Mariotti, 2020) reveals the role of employment, long-term cultural change, and immigration as key to explain the rise of right-wing populist votes in the 2014 and 2019 European elections.

1.3 An overview of anti-elite parties in Europe

This last section of Chapter 1 aims at giving an overview of the recent electoral results registered by populist parties.[1] To do so, we map the votes registered by parties with high anti-elite salience and Euroscepticism in the latest National Parliament elections, in the regions belonging to the 28 European countries. As previously stated, anti-elite rhetoric is a part of the definition of populism (Mudde, 2004). Indeed, the anti-elite and anti-European rhetoric are used in populist parties' language to protect common people from the political elites (Acemoglu et al., 2013). We collected data from national sources at the regional level, which is generally the most important subnational political and decisional centre for national and European policies. We choose to map the national elections that span from 2015 to 2019. In order to select parties with anti-elite and anti-European orientation, we rely on the classification made by Algan et al., 2017; Polk et al., 2017 and on the parties' ideological positioning based on the political manifestos of the European political group to which they belong.[2] In particular, we sum up the vote shares of the parties belonging to the following groups: *Europe of Freedom and Direct Democracy* (EFDD), *European Conservatives and Reformists* (ECR), *Identity and Democracy* (ID) and *European United Left-Nordic Green Left* (EUL/NGL). The map is shown in Figure 1.1.

The following parties are included, by group:

- members of the *Identity and Democracy* group are the FPÖ (Austria), VB (Belgium), Freedom and Direct Democracy (Czech Republic), AfD (Germany), Danish People's Party (Denmark), Conservative People's Party of Estonia (EKRE, Estonia), Finns Party (Finland), National Front (France) and Lega Nord (Italy);

- members of the *European Conservatives and Reformists* group are New Flemish Alliance (N-VA, Belgium), Patriotic Front (IMRO, Bulgaria), Civic Democratic Party (ODS, Czech Republic), Greek solution (Greece), Vox (Spain), Fratelli d'Italia (Italy), Christian Families Alliance (LLRA, Lithuania), National Alliance (LNNK, Latvia), Reformed Political party

[1] This section is part of the following published article: Ferrante C, Pontarollo N. Regional voting dynamics in Europe: The rise of anti-elite and anti-European parties. *Environment and Planning A: Economy and Space*. 2020;52(6):1019-1022.

[2] For a complete overview of the European political groups, see: https://en.wikipedia.org/wiki/Political_groups_of_the_European_Parliament#Current_composition_of_the_9th_European_Parliament.

(SGP) and Forum for democracy (FvD) in the Netherlands, Law and Justice (PiS, Poland), SD (Sweden), Freedom and Solidarity (SaS, Slovakia), Conservatives (United Kingdom);

- members of the *Europe of Freedom and Direct Democracy* group are Free Citizens Party (SSO, Czech Republic), Debout la France (France), Five Stars Movement (Italy), Order and Justice (Lithuania), Liberty (KOR-WiN, Poland), UKIP (United Kingdom);

- members of the *European United Left-Nordic Green Left* group are Workers' Party of Belgium (PTB/PVDA, Belgium), AKEL (Cyprus), Communist Party of Bohemia and Moravia (KSCM, Czech Republic), Linke (Germany), Unity List - Red-Green (EL, Denmark), Syriza (Greece), Podemos (Spain), Basque Country Unite (EHB, Spain), United Left (Spain), Left Alliance (Finland), La France Insoumise (France), Sinn Féin (Ireland), Party for the Animals (PvdD, Netherlands), Coligacao Democratica Unitaria (PCP-PEV, Portugal), Bloco de Esquerda (BE, Portugal), Left Party (Sweden).

We take as reference the EU average, equal to 25%, and we identify four groups of countries. In the first one, Bulgaria, Hungary, Latvia, the Netherlands, Croatia, Slovenia and Sweden, have parties with anti-elite and anti-European orientation which registered between 0 and 10 percentage points. The second group includes Denmark, Estonia, Ireland, Latvia, Portugal and Slovakia. In these countries, parties with anti-elite and anti-European orientation obtained between 11% and 20% of votes. In countries like Austria, Cyprus, Germany, Spain, Finland and France, the share of votes is around the EU average. Finally, support higher than 30% for parties with anti-elite and anti-European orientation is found in Belgium, the Czech Republic, Greece, Poland, the United Kingdom and Italy. It is worth mentioning that the Hungarian party Fidesz, although it has a right-wing nationalistic ideology (Polk et al., 2017), is affiliated to the European People's Party, which does not belong to any of the considered European political groups. The within country analysis shows that Italy has homogeneous territorial dynamics, where the Northern League and the Five Stars Movement registered a very high level of approval in all regions. Whilst, the United Kingdom exhibits a strong dichotomy between England, where Eurosceptic parties won 40% of votes, and the rest of the country, where the vote share was less than 30%.

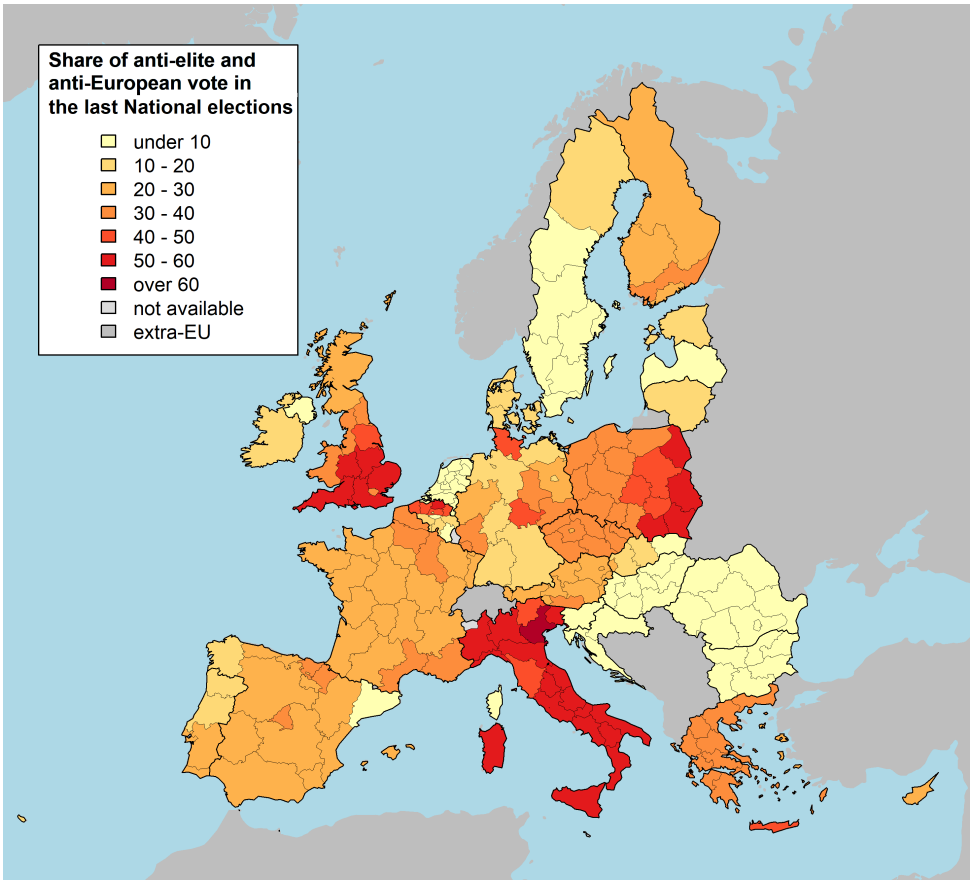


FIGURE 1.1: Map of anti-elite and anti-European vote in Europe.
Author's elaboration on data

In Poland, the Eurosceptic PiS party commanded the strongest support in the eastern regions, with more than 45% of votes. In Greece and the Czech Republic, no relevant territorial variation is observed. In Belgium, instead, the support for parties with anti-elite and anti-European orientation was well above 40% in the Flanders and less than 6% in Wallonia. The other countries seem to have quite homogenous patterns, with few exceptions. Worth mentioning is that, in Spanish regions, Vox and Podemos' support was between 20 and 40 percentage points, except for Catalunia, where Podemos gained no consensus due to the significant prevalence of regional parties. In Germany, finally, regions behave quite heterogeneously. In some, such as Thuringia, Saxony and the northern Schleswig-Holstein, parties with anti-elite and anti-European orientation registered between 35% and 40% in the last elections, with rising approval for Linke and Alternative für Deutschland.

Figure 1.2 shows the percentages of anti-elite and anti-European votes mapped into the voter cartogram. Regions with the highest number of voters

belong to Italy, the United Kingdom and Germany. In the first two countries, we observe a high share of votes for anti-elite and anti-European parties, while in the latter, the support is low. Madrid, Paris, Athens are in regions with a high number of voters too, as for most metropolitan cities. In Polish regions, where support for Eurosceptic and anti-elite parties is strong, the number of people voting is low. Scandinavian and Baltic regions have a low number of voters too.

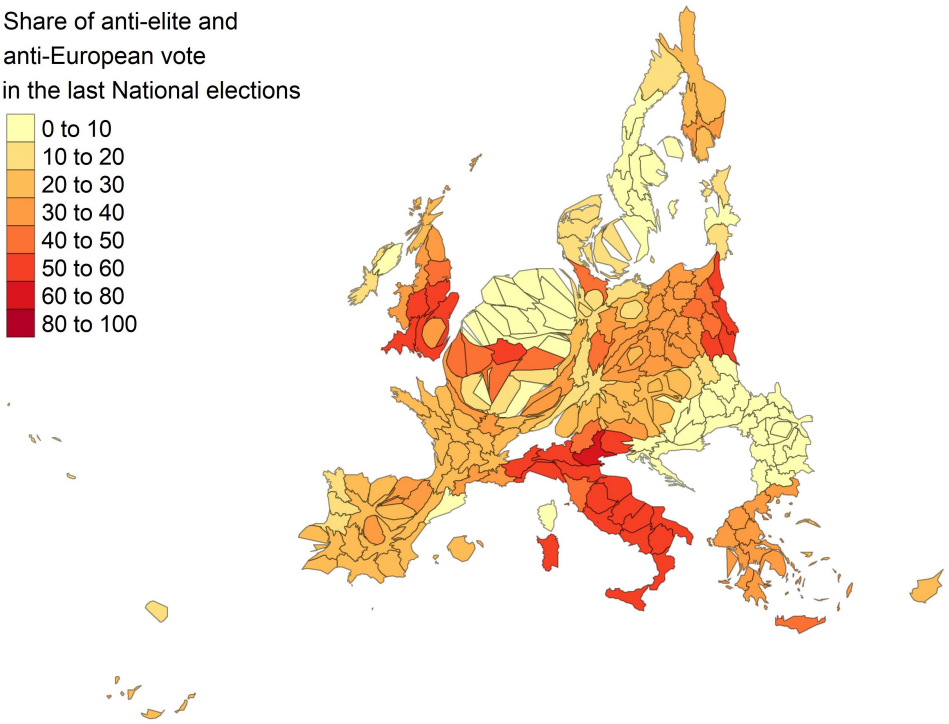


FIGURE 1.2: Cartogram of anti-elite and anti-European votes over voters.
The area of each region is proportional to its number of voters on the cartogram.
Author's elaboration on data

Overall, we observe that Eurosceptic and anti-elite parties have gained strong support across Europe, with some countries more affected than others and with some interesting territorial patterns. Although the national average is a good approximation of what is happening at the regional level, in others it may hide some more local aspects, like the strong regional heterogeneity in Germany or the territorial dichotomies in Belgium, Poland and the United Kingdom. This descriptive analysis calls for closer attention to the territorial context and its analysis related to the electoral outcomes.

Part II

2 Populism and the role of institutional quality

Part II of this thesis has the main goal of contributing to the geography of discontent literature. We do so in two different ways. Chapter 2 investigates the effect of perceptions of regional institutional quality on the support for populist parties. We assess this effect in a sub-national setting, which involves regions from 28 European countries, implementing the traditional empirical models used in this strand of literature. Chapter 3 will pave the way to enhance the traditional approach with a method that highlights the geographical dimension of the analysis.

2.1 The role of institutional quality

The core argument of the populist rhetoric grounds on its constant distinction between the *pure* people and the *corrupt* elite (Mudde, 2007). It stems from its inherent definition that voters might have found in the populist rhetoric the cradle where their feelings of frustration and discontent were fully understood. In this Chapter, we test the hypothesis that these feelings come from the people's perceptions of the regional quality of institutions. People, indeed, have a personal experience with regional institutions; therefore, a closer picture of the quality of public services, their allocation and the potential presence of corruption. We hypothesise that if citizens feel unsatisfied with their institutions, they might react in the ballot box, voting for populist parties. The literature review in Chapter 1 has already clarified the key drivers behind this turn in political preferences. We now recall some academic studies which support the idea behind our hypothesis.

Academia, indeed, has not ignored the role of institutions. Most of the studies consider the decrease in confidence and the growing distrust in national or European institutions (Mounk, 2018). Using ESS data, Dustmann et

al., 2017 and Algan et al., 2017 find that populist support is negatively associated with trust in national institutions, and it is mainly explained through regional unemployment and a decrease in wealth. Guiso et al., 2019 unveil that economic insecurity, as one of the main determinants of the populist vote, is strongly associated with political distrust and dissatisfaction with democracy. Indeed, Margalit, 2019 argues that it is often the resentment coming from economic insecurity, unemployment and globalization to exacerbate people's beliefs about the unfair allocation of public resources, bringing about a decline in political trust and a tendency to find relief in populist parties, which answer their claims providing short-term and immediate answers. Agerberg, 2017 shows through an individual study that the perceptions on the local quality of government have an impact on democracy and politics. They influence political preferences and the support towards populist parties. Acknowledging and controlling for the effects of economic conditions and cultural features, we address our attention to perceptions of regional institutional quality. Following Putnam, 1992 and Fieschi and Heywood, 2004, we argue that when democracy and institutions are trusted, populist parties have fewer arguments to fuel the anti-elite discourse and, therefore, they attract fewer voters. We assume the same kind of mechanism applies when dealing with perceptions on institutional quality and their impact on spreading feelings of political distrust and discontent. Moreover, we focus on regional institutions, that is where citizens are more likely to witness corrupted or impartial behaviours (Sundström and Stockemer, 2013).

The Chapter proceeds as follows: the next section presents the dataset used in the analysis; Section 2.3 describes the empirical strategy; Sections 2.4 and 2.5 show the results and the robustness tests, respectively; the last section discusses the results obtained.

2.2 Data

We carry out the analysis at the regional level. We build a NUTS-2 level database (NUTS-1 for Germany and the United Kingdom and NUTS-0 for Estonia, Latvia, Lithuania, Luxembourg, Malta and Cyprus), including 28 European countries. We collect data on national election results from the respective national sources for the period 2011-2019. We decided to split the electoral results into two datasets, covering 2011-2016 and 2015-2019 timespans. Dividing the dataset allows us to consider two different economic and political contexts. The 2011-2016 subset takes into account the first election

rounds available in the aftermath of the 2008 financial crisis and the subsequent debt crisis; the 2015-2019 subset considers the second election rounds available for each country, which all occurred in a post-crisis context. Though the two datasets share two years (2015 and 2016 only for Spain), we never account for the same election in the two subsets. They correspond to people's reactions in the same region, in two different socio-economic contexts. Table 2.1 summarises the election year corresponding to each country in each subset and the territorial level on which we conduct the analysis.

Our outcome variable is the populist vote share. We build it using the classification introduced by Norris and Inglehart, 2019. They built continuous standardized 0-100 scores for 268 political parties in Europe to identify their authoritarian-libertarian, populist-pluralist, left-wing or right-wing orientation, using the 2014 Chapel Hill expert survey (CHES).[1] We focus on the populist component, which catches the anti-elite discourse (Norris and Inglehart, 2019). Following a similar approach to Albanese et al., 2019, we build our outcome variable by multiplying each party's voting share by its populist score, and then we collapse them at the corresponding territorial level. The populist vote share is displayed in Figure 2.1 for each period. Tables A.2, A.3 and A.4 in Appendix A show the populist score registered by each party included in the analysis.

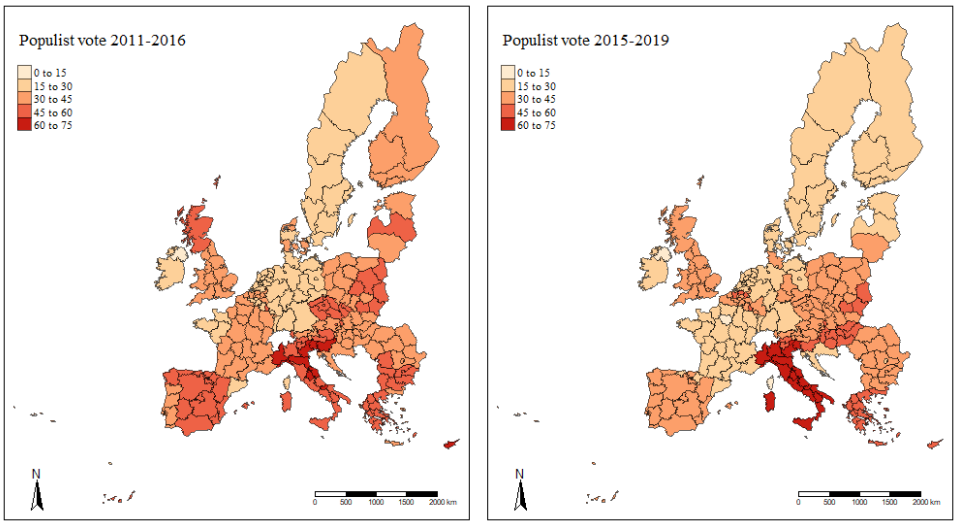


FIGURE 2.1: Maps of populist vote in the two periods
Author's elaboration on collected data

[1]The CHES is a project on European politics led by the University of North Carolina at Chapel Hill's Center for European Studies. This project estimates party positioning on European integration, ideology and policy issues for national parties in Europe.

TABLE 2.1: Election rounds

Country	2011-2016	2015-2019	Territorial level
Austria	2013	2017	NUTS-2
Belgium	2014	2019	NUTS-2
Bulgaria	2014	2017	NUTS-2
Cyprus	2011	2016	NUTS-0
Czech Republic	2013	2017	NUTS-2
Germany	2013	2017	NUTS-1
Denmark	2015	2019	NUTS-2
Estonia	2015	2019	NUTS-0
Greece	2012	2015	NUTS-2
Spain	2016	2019	NUTS-2
Finland	2015	2019	NUTS-2
France	2012	2017	NUTS-2
Croatia	2011	2015	NUTS-2
Hungary	2014	2018	NUTS-2
Ireland	2011	2016	NUTS-2
Italy	2013	2018	NUTS-2
Lithuania	2012	2016	NUTS-0
Luxembourg	2013	2018	NUTS-0
Latvia	2014	2018	NUTS-0
Malta	2013	2018	NUTS-0
Netherlands	2012	2017	NUTS-2
Poland	2011	2015	NUTS-2
Portugal	2011	2015	NUTS-2
Romania	2012	2016	NUTS-2
Sweden	2014	2018	NUTS-2
Slovenia	2014	2018	NUTS-2
Slovakia	2012	2016	NUTS-2
United Kingdom	2015	2017	NUTS-1

The first map corresponds to the first populist outbreak, happening right after the financial crisis and affecting the vast majority of European regions, particularly in the Southern countries. The second map shows the persistency of that effect, in the next elections. Italy continues to express a large consensus towards populist parties, but results are high also in Spain, the United Kingdom, Greece and in Eastern Europe.

The choice to focus on the populist component relies on two crucial factors. First, considering the period 2011-2016, right after the Great Recession, voters might have decided to support populist parties, following their anti-elite rhetoric, as an expression of discontent for the bad crisis management and the resulting misallocation of resources (Algan et al., 2017; Guiso et al., 2019). The same kind of behaviour might also be true in 2015-2019, as a long-term effect. Moreover, when citizens perceive their institutions are corrupt or not efficient, they might express their discontent by abstaining on the election day or voting who condemns that kind of behaviour (Kostadinova, 2009; Sundström and Stockemer, 2013). Therefore, we consider populist parties as those that unsatisfied voters would support to express their dissatisfaction against the bad quality of their regional institutions.

To measure the quality of institutions, our key explanatory variable, we rely on the European Quality of Government Index (EQI). The index has been built by the Quality of Government Institute of the Gothenburg University, and it is the only European index available at sub-national levels (NUTS-1 and NUTS-2). The index is funded by the European Commission, it is available for the 2010, 2013 and 2017 years, and it captures the more informal aspects of institutions (Charron et al., 2014; Charron et al., 2015; Charron et al., 2019), covering 208 regions. It is a multi-dimensional index based on a novel survey where data are collected to be representative at the sub-national level. It summarizes three pillars: the average of people's perceptions of corruption, the impartial allocation of resources and the quality of public services in their region. We use the country centred and min-max (0-100) standardized version of the index. Moreover, for the sake of our analysis and following Rodrıguez-Pose and Di Cataldo, 2015 and Crescenzi et al., 2016, we will also use the European Quality of Government index built by Charron et al., 2014, who integrated the regional EQI with the World Bank Governance Indicators (WBGI) developed by Kaufmann et al., 2009. This new version of EQI, which goes from 1997 to 2009, contains four pillars: effectiveness of regional

government and bureaucracy, rule of law, accountability of the regional administration and strength of democracy and level of corruption. We will use 1997 EQI version, which is normalized and ranges between 0 and 1. Figure 2.2 maps the EQI index in 2010 and 2013. Lighter regions, corresponding to lower values, indicate low institutional quality. Southern and central Italian regions, Greek, Romanian and Bulgarian regions are among those registering the lowest levels. In contrast, the highest scores are registered in British and German regions, in the Netherlands, Austria, Sweden and Finland. In 2013 their scores decrease but remain above the average.

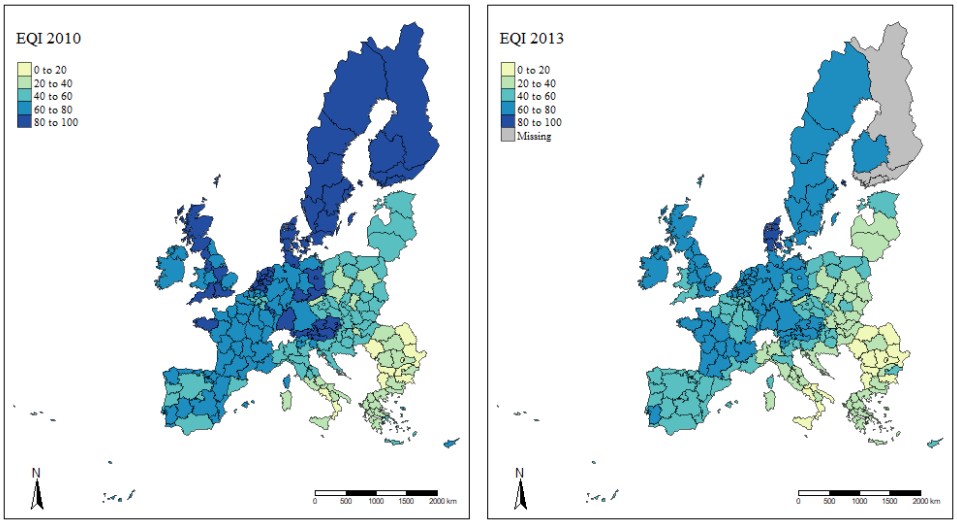


FIGURE 2.2: Maps of the regional European Quality of Government Index
Author's elaboration on collected data

To account for the economic conditions of regions and to catch their economic performance, we use a measure of regional resistance to recessionary shocks. With this indicator we control for the effects of the economic and financial crisis and at the same time for the economic performance of the region. Following Lagravinese, 2015, Martin et al., 2016, Giannakis and Bruggeman, 2017 and Ezcurra and Rios, 2019, the resistance to recessionary shocks is defined as follows:

$$Economic\ Resistance_{\ i} = \frac{\Delta E_i - \Delta EU}{|\Delta EU|} \tag{2.1}$$

where ΔE_i is the change in the employment rate in region i between recession and recovery period, identified as year 2008 and 2013, respectively. ΔEU measures the average variation in the employment rate among European regions. When ΔEU is positive, region i is registering a stronger resistance

to the shock with respect to the European average. In the opposite case, a negative value of ΔE means that the region is resisting less than the other European regions. When the region's behaviour is in line with the rest of Europe, we will have a resistance value equal to zero. Calculating the economic resistance measure on the employment rate makes it possible to measure the capacity of the regional labour market to react to shocks and, hence, the potential social impact of the shock itself.

Following the literature review exposed in Chapter 1, we introduce a set of social and demographic variables collected from the Eurostat database to control specific regional characteristics. Age and education are measured respectively as the share of people aged between 15 and 24 years over the total working population (aged 15-64) and the share of people who attained a tertiary education level. Following the academic studies of Los et al., 2017, Dijkstra et al., 2020, among others, we support the idea that younger and higher educated people are less prone to vote for populist parties. We also account for population density as a crucial factor to capture the positive relationship between anti-system votes and low-populated places (Rodden, 2016; Lee et al., 2018).

Concerning the cultural aspects, the literature has highlighted the divide between cosmopolitan and traditional values as one of the crucial aspects leading to an increase of anti-system votes (Essletzbichler et al., 2018). The "post-materialist" era and the fear of more progressive values have revealed a backlash towards the importance of the national identity and traditional values (Inglehart and Norris, 2016; Rodrik, 2018). Together with the before mentioned demographic controls, we introduce a novel variable able to capture both the economic and cultural aspects of each region. We will use the share of nights (over total nights in the respective country) spent in touristic establishments registered in the region, to proxy the regional tourist attractiveness and the territory's cultural dynamics, i.e. openness and multiculturalism. We also include the net migration rate to investigate the role of immigration in fuelling anti-establishment sentiments (Ford and Goodwin, 2017; Dijkstra et al., 2020).

Table 2.2 shows the descriptive statistics of each variable included in the analysis, for the two time-period considered. The number of observations in

the second period decreases due to missing values in the explanatory variables. A more detailed description of the variables and their sources can be found in Appendix A.

TABLE 2.2: Descriptive statistics

	First election round - variables at 2010 (n. 208)				Second election round - variables at 2013 (n. 197)				
Variable	**Mean**	**s. d.**	**Min**	**Max**	**Variable**	**Mean**	**s. d.**	**Min**	**Max**
Populist vote2011-2016	40.12	11.32	0	63.83	**Populist vote2015-2019**	37.49	13.65	0	70.08
EQI2010	61.81	21.83	0	100	**EQI2013**	51.56	18.49	0	100
Corruption 2010	59.21	21	0	100	**Corruption 2013**	53.97	20.97	0	100
Quality 2010	64.42	19.76	0	100	**Quality 2013**	51.83	17.36	0	100
Impartiality 2010	62.9	21.29	0	100	**Impartiality 2013**	54.62	16.88	0	100
Economic resistance	-0.01	1.45	-4.98	3.71	**Economic resistance**	-0.01	1.99	-5.36	4.04
Young population	18.06	2.1	12.64	22.93	**Young population**	17.41	2.12	11.62	22.33
Tertiary education	24.49	8.72	9	49.5	**Tertiary education**	26.95	8.92	11.4	54.2
Net migration	1.8	4.53	-25.2	19.2	**Net migration**	2.41	7.01	-14	55.2
Population density	334.18	922.47	3.07	10673.17	**Population density**	340.19	969.04	3.08	11414.44
Tourism	66.55	22.37	4.66	96.9	**Tourism**	64.18	23.23	3.9	96.2
EQI 1997	0.72	0.19	0.03	0.99	**EQI 1997**	0.72	0.19	0.03	0.99
Corruption 1997	0.72	0.18	0.08	0.97	**Corruption 1997**	0.72	0.18	0.08	0.97
Quality 1997	0.66	0.2	0	0.98	**Quality 1997**	0.66	0.2	0	0.98
Impartiality 1997	0.67	0.18	0.03	1	**Impartiality 1997**	0.67	0.18	0.03	1

2.3 Empirical model and identification strategy

To test our hypothesis, we follow the approach adopted by the main academic studies on the geography of discontent, and we conduct our analysis using the Ordinary Least Square (OLS). We will have two settings of analysis, one for each election round. For the first setting, we define our model as:

$$Populist\ vote_{i2011-2016} = \alpha + EQI_{i,2010} + EconResistance_{i\,2013}^{2008} + \bar{X}_{i,2010} + \varepsilon_i \tag{2.2}$$

Where i identifies the region, $Populist\ vote_{i2011-2016}$ is the share of populist vote as previously defined, considering the elections occurred in the period 2011-2016. $EQI_{i,2010}$ is the European Quality of Government Index taken at 2010. $EconResistance_{i\,2013}^{2008}$ corresponds to the measure of regional economic performance with respect to the European average and $\bar{X}_{i,2010}$ is the set of control variables taken at 2010; ε_i is the error term.

The variables are taken at time 2010 to avoid any problem of reverse causality. Moreover, to reduce potential endogeneity problems in the institutional quality index, we support the OLS analysis with the Instrumental

Variable (IV) approach. For a variable to be considered a valid instrument, it should satisfy the relevance and exclusion restrictions, i.e. be uncorrelated with the error term and sufficiently strong correlated with the explanatory variable. We instrument the EQI_i with its lagged version, corresponding to 1997, which is unlikely to be influenced by current shocks. Furthermore, the exclusion restriction might be violated if some missing permanent characteristics related to socio-economic conditions affected both the historical institutional quality and the current levels of populist vote. However, in our model, we directly control the most relevant economic characteristics. In light of these motivations, we consider the EQI in 1997 a good candidate to instrument our current EQI. We will run the OLS and the Two-Stage Least Square estimation (2SLS) to show the reliability of the results. First, we assess the role of the EQI on populist vote share, and then, we decompose the effects analysing the three pillars: corruption, impartiality and quality of public services. Each pillar is analysed separately, using as instrumental variable, respectively, the 1997 EQI version of the level of corruption, government accountability and government effectiveness.

The above-mentioned empirical approach will be replicated in the second setting of analysis. In this case, we consider the election rounds that occurred between the 2015 and 2019, and $Populist\ vote_{i2015-2019}$ will be regressed on EQI_i and $\bar{X}_i$ taken at 2013. We define the model as:

$$Populist\ vote_{i2015-2019} = \alpha + EQI_{i,2013} + EconResistance_{i2013}^{2008} + \bar{X}_{i,2013} + \varepsilon_i \tag{2.3}$$

Table A.5 and A.6 in Appendix A shows the correlation tables, for each framework of analysis. They display a low correlation between variables, reducing the risk of collinearity. In the correlation tables, we display also the instrumental variables, and we can see that their correlation with the respective key explanatory variable is sufficiently strong. In the next section, the results will be shown for each setting of analysis. First, we display the results on the EQI, and then, we decompose its effect and we show the results for the corruption, impartiality and quality pillars. To further explore the results, we will also display the relative importance of each regressor with respect to the model's total explanatory power, following the work of De Dominicis et al., 2020. This is a measure introduced by Lindeman, 1980. It is used to quantify

each variable's importance and it also gives insights when deciding policy interventions. The methodology behind consists in the decomposition of the R^2 into non-negative contributions for each predictor variable; then, it calculates the additional contribution of each predictor in all subset models of the original model, independently from their statistical significance.

2.4 Results

In this section, we show the OLS and 2SLS results, for the elections that occurred in 2011-2016 and 2015-2019. Concerning the first round of elections, the OLS results are in Table 2.3, which counts for 208 observations, and includes standard errors between parentheses, clustered at the country level. Table 2.3 shows a negative impact of the European Quality of Government Index, significant at 1% level, meaning that when regional institutions are perceived to be good, impartial and uncorrupted, the support to populist parties tends to decrease. The estimated coefficients of the control variables follow the existing literature. A negative and significant relationship exists when looking at the economic performance of regions. In regions that better resist to the crisis, performing above the European average in terms of employment rate, voters decrease their support towards populist parties. This result confirms the role had by the economic and financial crisis in shaping the geography of discontent, especially in the lagging behind areas (Rodrıguez-Pose, 2018). We find a highly significant and negative impact on the share of the young population and tertiary education. When the shares of these two variables are higher, the populist support decreases, confirming what De Dominicis et al., 2020 and Dijkstra et al., 2020 already found. The impact of net migration is positive but inconclusive. Similarly, population density has a negative relationship with populist vote share, but it is not significant. Tourism has a negative impact on populist support, but it becomes significant at 10% level only when turning to the IV approach. When a region is more attractive and therefore more exposed to a multicultural context, populist support decreases. This novel result is in line with the literature that associates fears of progressive values and culture with the rise of anti-establishment vote share (Inglehart and Norris, 2016). The IV approach in column (2) confirms the OLS results, which remain highly significant, and the diagnostics reveal that the EQI at 1997 is a good instrument. The Wu-Hausman test for endogeneity and its p-value smaller than 1% suggest that the 2SLS estimator is preferred to the OLS estimator, though some observations are deleted due to missing values in the instrument used. First stage regression in Table A.7, Appendix A, confirms the relevance of the instrumental variables used.

TABLE 2.3: Regression Results vote: 2011-2016 elections, variables at 2010

	Dependent variable: Populist vote2011-2016	
	OLS	IV
	(1)	(2)
EQI2010	-0.253***	-0.227***
	(0.033)	(0.037)
Economic resistance	-1.492***	-1.876***
	(0.409)	(0.396)
Young population	-1.476***	-1.475***
	(0.323)	(0.313)
Tertiary education	-0.248***	-0.317***
	(0.082)	(0.087)
Net migration	0.169	0.062
	(0.187)	(0.140)
Population density	-0.001	-0.001
	(0.001)	(0.001)
Tourism	-0.047	-0.064*
	(0.031)	(0.036)
Constant	91.582***	93.043***
	(6.117)	(7.740)
Weak instrument test – EQI 1997		1794.59
(p-value)		(0.000)
Wu-Hausman test		20.47
(p-value)		(0.000)
Observations	208	166
R^2	0.521	0.555
Adjusted R^2	0.504	0.535

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

We find similar results for the 2015-2019 period. In this case, observations drop from 197 to 156 when switching from the OLS to the IV approach. However, diagnostics confirm the latter to be preferred. The IV results, column (2) in Table 2.4, confirm the negative and significant impact at 1% level of the EQI, taken in 2013. The impact and significance of economic resistance,

the share of the young population and tertiary education are similar to the previous round of elections. The impact of the share of young population is slightly decreased but still significant at 5%.

TABLE 2.4: Regression Results vote: 2015-2019 elections, variables at 2013

	Dependent variable: Populist vote2015-2019	
	OLS	IV
	(1)	(2)
EQI2013	-0.277***	-0.222***
	(0.058)	(0.062)
Economic resistance	-1.405***	-1.459***
	(0.320)	(0.396)
Young population	-0.628**	-0.551**
	(0.281)	(0.264)
Tertiary education	-0.381***	-0.400***
	(0.105)	(0.108)
Net migration	0.552***	0.634***
	(0.136)	(0.150)
Population density	0.0002	0.0001
	(0.0005)	(0.001)
Tourism	-0.072**	-0.078***
	(0.031)	(0.030)
Constant	76.235***	72.757***
	(5.290)	(5.242)
Weak instrument test - EQI 1997		880.93
(p-value)		(0.000)
Wu-Hausman test		25.57
(p-value)		(0.000)
Observations	197	156
R^2	0.525	0.478
Adjusted R^2	0.508	0.454

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

In this setting, also net migration has a significant impact. This result means that when more people enter the region, anti-immigrant feelings tend

to increase the populist consensus, confirming its role in fuelling sentiments of fear for the economic uncertainty and the local identity. Population density has a positive coefficient but very close to zero, therefore inconclusive. The negative impact of tourism become significant at 1% level, supporting the hypothesis that people living in regions able to attract more tourists, and therefore more exposed to diverse and multicultural environments, vote less for populist parties.

For both settings, the regional institutional quality has a significant impact on the populist vote share. These results are confirmed by Figure 2.3, which displays the relative contribution of each independent variable, normalized and summed to the total R^2, for the two settings of analysis. For both election rounds, we can see that the highest contribution to the total R^2 comes from the index of regional quality of institutions, registering almost 50% for the first round of elections and almost 40% for the second one. This result confirms our initial hypothesis on the role of perceptions on institutions in affecting voters' choices (Kostadinova, 2009). The second variable for relative importance is the share of the young population, followed by the share of tertiary education, whose contributions range between 15 and 25%. Minor contributions are given by economic resistance, tourism, net migration and ultimately by population density.

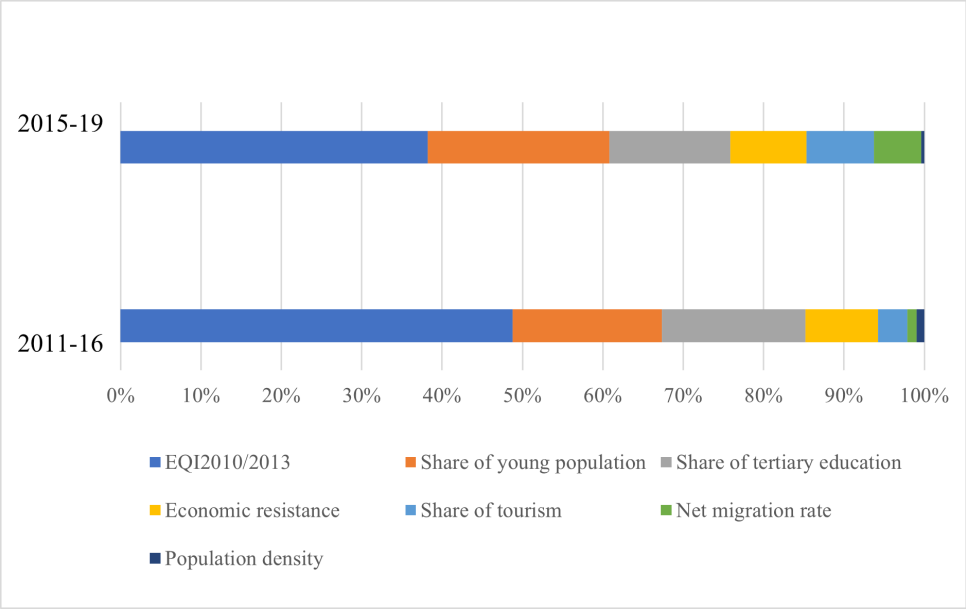


FIGURE 2.3: Relative importance of variables
Author's elaboration on collected data

Next, we investigate the impact of the EQI, analysing its components one

by one. Again, we apply both OLS and IV approaches to assess the impact of corruption, impartial allocation of public services and their quality on populist vote share. We use as instruments the equivalent pillar of the EQI index, available in 1997. Table 2.5 displays the results for the 2011-2016 rounds of elections. We can see that, though the instruments are always valid, the OLS estimator is more efficient. The negative and highly significant impact of economic resistance, the share of young population and share of tertiary education on populist vote share is very similar to the results in Table 2.3. Looking at the three pillars, their coefficients' size is almost the same, slightly higher for corruption levels, and they are all significant at 1% level. These results support the idea that when people perceive that their regional institutions are corrupt, the services are allocated impartially and implemented in a bad quality, they tend to vote for populist parties, as capable of mirroring their dissatisfaction and of claiming the emergency of their needs, which mainstream parties have failed to address.

Similar results are displayed in Table 2.6 for the 2015-2019. Here, the IV approach is to be preferred only when analysing the impact of the quality pillar. In this setting, perceptions of impartiality and corruption levels have higher coefficients, which are always significant at 1% level. Results for economic resistance, the share of young population and tertiary education are coherent with those in Table 2.4. The net migration rate still displays a positive and highly significant effect on the populist vote. The share of touristic attraction is negative and significant only when considering the quality and impartiality pillar.

The figures below show the relative importance of each variable for the 2011-2016 round of elections (2.4) and for the 2015-2019 round of elections (2.5). In the former, the three pillars mostly contribute to the total R^2, accounting together for 40 to 50%. Around 20, the percentage explained by the share of tertiary education and young population. Economic resistance, tourism, net migration rate and population density follow with minor contributions.

In the latter, the corruption and impartiality pillars contribute to around 40% of total R^2, while the quality pillar contributes to almost 30%, together with tertiary education. In this setting, the net migration rate plays a more relevant role, contributing to more than 10%. Economic resistance, the share of young population, tourism and population density follow with minor contributions.

TABLE 2.5: Decomposition of EQI - Regression Results vote: 2011-2016 elections, variables at 2010

	Dependent variable: Populist vote2011-2016					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
EQI corruption2010	-0.274***			-0.276***		
	(0.036)			(0.042)		
EQI quality2010		-0.251***			-0.259***	
		(0.035)			(0.046)	
EQI impartiality2010			-0.245***			-0.255***
			(0.032)			(0.052)
Economic resistance	-1.589***	-1.701***	-1.299***	-1.830***	-2.045***	-1.638***
	(0.402)	(0.424)	(0.413)	(0.398)	(0.410)	(0.404)
Young population	-1.423***	-1.425***	-1.621***	-1.390***	-1.368***	-1.693***
	(0.322)	(0.338)	(0.327)	(0.303)	(0.320)	(0.309)
Tertiary education	-0.268***	-0.302***	-0.272***	-0.289***	-0.306***	-0.296***
	(0.081)	(0.082)	(0.081)	(0.087)	(0.091)	(0.105)
Net migration	0.224	0.183	0.090	0.137	0.072	0.011
	(0.185)	(0.201)	(0.188)	(0.142)	(0.154)	(0.132)
Population density	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tourism	-0.039	-0.052*	-0.055*	-0.061	-0.059*	-0.072*
	(0.032)	(0.029)	(0.032)	(0.038)	(0.035)	(0.037)
Constant	91.079***	92.751***	95.222***	92.854***	93.078***	99.366***
	(6.060)	(6.350)	(6.133)	(7.560)	(8.227)	(7.696)
Weak instrument test - IV 1997				1655.76	477.29	140.01
(p-value)				(0.000)	(0.000)	(0.000)
Wu-Hausman test				1.81	0.31	0.03
(p-value)				(0.180)	(0.576)	(0.873)
Observations	207	207	207	166	166	166
R^2	0.542	0.495	0.514	0.573	0.528	0.537
Adjusted R^2	0.526	0.477	0.497	0.554	0.507	0.517

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

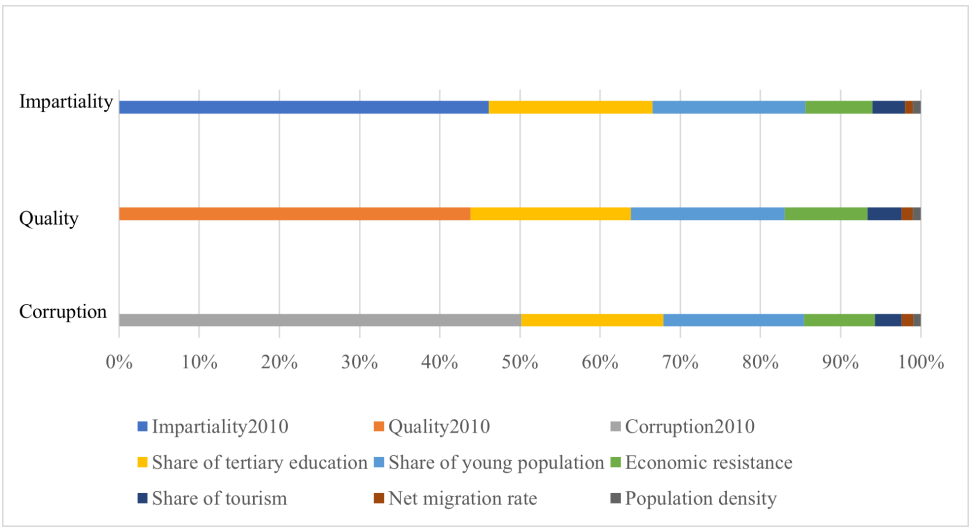


FIGURE 2.4: Relative importance of variables
Author's elaboration on collected data

TABLE 2.6: Decomposition of EQI - Regression Results vote: 2015-2019 elections, variables at 2013

	Dependent variable: Populist vote2015-2019					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
EQI corruption2013	-0.299***			-0.243***		
	(0.049)			(0.055)		
EQI quality2013		-0.189***			-0.211***	
		(0.062)			(0.073)	
EQI impartiality2013			-0.309***			-0.098
			(0.062)			(0.085)
Economic resistance	-1.339***	-1.636***	-1.285***	-1.515***	-1.513***	-1.548***
	(0.302)	(0.337)	(0.325)	(0.377)	(0.409)	(0.437)
Young population	-0.479*	-0.758**	-0.763***	-0.432*	-0.531*	-0.769***
	(0.272)	(0.306)	(0.270)	(0.259)	(0.292)	(0.285)
Tertiary education	-0.311***	-0.503***	-0.390***	-0.339***	-0.429***	-0.570***
	(0.105)	(0.105)	(0.101)	(0.109)	(0.114)	(0.128)
Net migration	0.568***	0.537***	0.537***	0.645***	0.639***	0.600***
	(0.135)	(0.134)	(0.132)	(0.143)	(0.157)	(0.165)
Population density	0.0004	0.0003	0.00002	0.0003	0.0001	0.0003
	(0.001)	(0.0005)	(0.0005)	(0.001)	(0.001)	(0.001)
Tourism	-0.046	-0.081**	-0.085***	-0.056*	-0.081**	-0.090***
	(0.031)	(0.033)	(0.031)	(0.029)	(0.033)	(0.033)
Constant	71.893***	77.776***	82.341***	69.364***	72.706***	75.643***
	(5.255)	(5.530)	(5.311)	(4.959)	(5.665)	(6.048)
Weak instrument test - IV 1997				655.34	492.81	180.71
(p-value)				(0.000)	(0.000)	(0.000)
Wu-Hausman test				22.58	0.04	37.34
(p-value)				(0.000)	(0.846)	(0.000)
Observations	197	197	197	156	156	156
R^2	0.566	0.472	0.534	0.525	0.415	0.430
Adjusted R^2	0.550	0.452	0.516	0.503	0.388	0.403

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

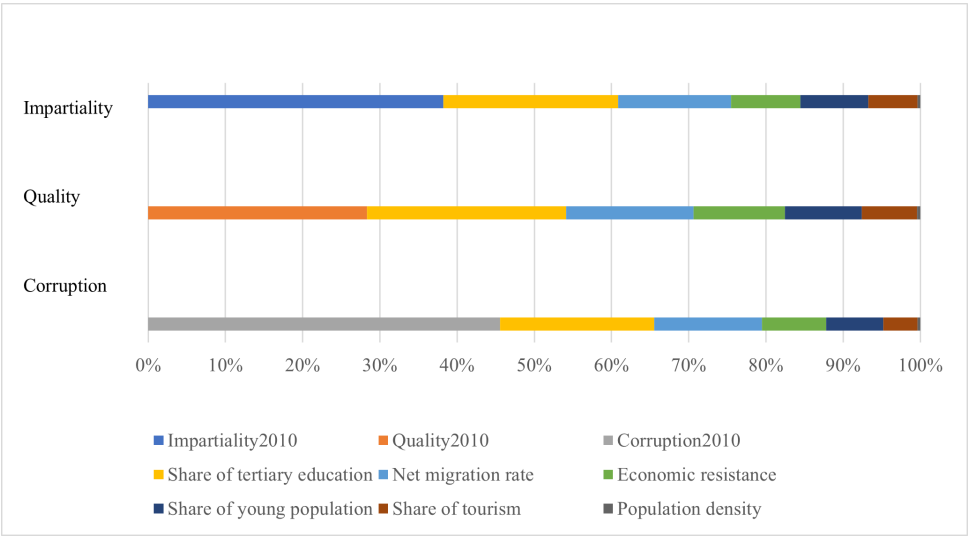


FIGURE 2.5: Relative importance of variables
Author's elaboration on collected data

2.5 Additional analysis and robustness checks

Before discussing the obtained results, we conduct a number of robustness tests, shown in Appendix A.3-A.5, to validate and confirm our results.

- *Different years for explanatory variables*
  The first test concerns the model's explanatory variables. We run the same model with 2011-2016 populist vote share as the outcome variable and taking the variables at the mean between 2010 and 2013 for EQI and all the other control variables. When turning to the 2015-2019 round of elections, we take the mean between 2013 and 2017 for the EQI and the mean between 2013 and 2015 for the control variables. Tables A.8 and A.9 show that changing the years of the explanatory variables does not undermine our main results.

- *Reduced number of observations*
  We run the main analysis on both election rounds, considering the EQI index as key explanatory variable, removing the observations that are not present in the IV approach. With equal number of observations, the estimates in Table A.10 and A.11 demonstrate that the main results hold.

- *Alternative outcome variables*

  – To demonstrate that populist parties are the beneficiaries of votes deriving from voters' dissatisfaction with institutions, we run the same empirical analysis for the two time-periods, taking different outcome variables. We test the effect of the regional institutional quality on the share of populist-authoritarian vote and the share of authoritarian vote only (Norris and Inglehart, 2019). We built these variables using the authoritarian score provided by Norris and Inglehart, 2019. In the first case, we consider both the populist and authoritarian component, while in the second, we focus only on the authoritarian one. The EQI effect on the share of populist-authoritarian vote, in Table A.12, is lower but still negative and significant; while, the results on the share of the authoritarian vote, in Table A.13 are not significant (except in 2015-2019 (IV) with a positive effect). Moreover, the R^2 in Table A.13 is very low in all the regressions. These results confirm that perceptions on regional institutional quality impact the vote towards populist parties.

– A further confirmation of this conclusion is given by an alternative variable of populist vote share. This time we build this variable using the *anti-elite salience* measured for each party by the 2014 Chapel Hill Expert Survey. The CHES measures the anti-elite salience, classifying parties from 0 (when it's not important) to 10 (extremely important). We select shares of parties registering an anti-elite score greater than 8 (only strong anti-elite salience). Taking only parties with a strong anti-elite salience, we can see from Table A.14 that our initial hypothesis is again confirmed.

Given the results of the main analysis and the robustness tests we can turn to the discussion section.

2.6 Discussion

The empirical analyses run in the previous sections had as main purpose to investigate the role of the regional institutional quality in shaping political preferences towards populist parties. What emerges from the results shown above is that perceptions on institutional quality are key in explaining the support towards populist parties, and including a direct measure of it allows us to capture the relationship between institutional dissatisfaction and populism. In particular, phenomena like corruption and a bad and impartial implementation of public services in sub-national institutions have direct implications in everyday life. People experiencing these kinds of frustrating situations might feel forced to give voice to their needs changing their political preferences. When traditional parties fail in coping with the main economic problems, but also the local institutions do not work properly, citizens lose their trust in democracy (Kostadinova, 2009) and find their answers in populist parties and in their anti-elite and anti-establishment rhetoric. As Revelli, 2017 states, the demand for populism comes from a lack of representative democracy which can be fuelled in people's sentiments when they perceive that they cannot trust their local institutions. Local institutions are, indeed, closer than the national ones to citizens and their quality also determines the effective implementation of European policies and programs (Rodrıguez-Pose and Garcilazo, 2015). When this quality is not delivered and citizens are directly affected by it, they express their dissatisfaction in the ballot box, supporting parties whose political campaign hinges on claiming the triumph of

common people and their needs.

Alongside the institutional aspects, results also remark the impact of the regional economic performance, which recalls what Dijkstra et al., 2020 and Rodrıguez-Pose, 2018, among others, already demonstrated. A great part of the dissatisfaction comes from lagging behind regions, which did not perform well after the economic and financial crisis, and they are still suffering from low employment rates. Concerning the presence of young and educated people, as already confirmed by many academic studies, it reduces the support towards populist parties, opposing the so-called cultural backlash. Whilst, population density does not seem to play a significant role in the examined empirical settings. Our measure of net migration gives us results of a positive relationship with the populist vote share in the second round of elections. That period corresponds to the beginning of the migrant crisis in 2013, and the subsequent elections might have been affected by this emergency. However, the literature on migration is still inconclusive, so further analysis should be conducted to confirm this result. The variable catching the touristic attractiveness introduces a new exploratory way of measuring how much the region is multicultural and open to progressive values. Its negative and significant relationship with populist vote share is in line with the theory and our initial hypothesis. Further checks should confirm its role, but we can say that its inclusion may enrich many empirical models.

In conclusion, the analyses conducted in this part of the chapter investigate the determinants of the geography of discontent, particularly the role of institutional quality, through the OLS and IV approaches. This empirical strategy is well established in this strand of literature. However, the estimated coefficients summarise the average effect of each variable across space, which are therefore defined as global parameters (Ali et al., 2007). Considering the territorial scale of each variable's effect through a geographical approach might improve the interpretation of the results, calculating local coefficients. This might represent a step ahead in the methodology used, introducing an approach that is already used in academia but whose potential has not been fully investigated in this field. In the next chapter, we will discuss the possibility to complement the OLS approach with the Geographically Weighted Regression and its recent developments, as an additional tool to have a closer look at the mechanisms behind the geography of discontent.

3 A geographical approach

This Chapter contributes to Part II, complementing the empirical approach used in Chapter 2 with the Geographically Weighted Regression and the recent development of the Multiscale Geographically Weighted Regression. The chapter aims to communicate and demonstrate that taking a more geographical perspective can help the quality and the interpretation of the results.

3.1 Why use the Geographically Weighted Regression

We have seen in the previous chapter how our key explanatory variables behave and impact the support for populist parties. However, the results obtained do not tell us anything about the spatial variability of the estimated coefficients. Indeed, each variable's relationship with populist vote share may occur at a global or local scale. Therefore, we propose the use of the Geographically Weighted Regression (GWR) (Brunsdon et al., 1996) to complement the OLS results, as means to unveil the variables' dynamics across space.

The GWR, in particular, estimates local regressions adopting a weighted least squares methodology to estimate local coefficients and highlight spatial heterogeneous effects. It operates as a "spatial microscope", which explores the relationship between each determinant and the variable of interest at the local scale, giving us insights into the dynamics occurring in each European region (Bourdin, 2019). Though some issues might come up implementing the GWR, such as multicollinearity in local estimates or spatially correlated errors - which can nevertheless be addressed and investigated -, it remains an essential exploratory tool to investigate spatial variation and spatial non-stationarity of parameters (Matthews and Yang, 2012). This methodology has been recently extended to the Multiscale GWR (MGWR) (Fotheringham

et al., 2017) that allows each relationship between dependent and independent variable to vary at different spatial scales. MGWR is less restrictive than the basic GWR, reducing the estimation's bias, mitigating the collinearity due to similar behaviours, and minimising over-fitting risk (Oshan et al., 2019).

The following section will explain the GWR methodology and clarify the different steps to estimate local parameters.

3.2 Methodology

The Geographically Weighted Regression (GWR) estimates the relationship between the dependent and independent variable for each territorial unit. Following the work of Fotheringham et al., 2003 and Fotheringham and Oshan, 2016, we can write the basic GWR model as follows:

$$y_i = \beta_{i0} + \sum_{k=1}^{m} \beta_{ik} x_{ik} + \epsilon_i, \qquad i = 1, \ldots, n \tag{3.1}$$

where y_i is the dependent variable at location i; β_{i0} is the intercept at each location i; x_{ik} represents the value of the k^{th} independent variable at location i; m refers to the number of independent variables and β_{ik} is the respective local coefficient for the k^{th} independent variable; ϵ_i is the respective local error term. The location i, for $i = 1, \ldots, n$, is indexed by the geographical coordinates (u_i, v_i). In our case, each region will be identified by its centroid's coordinates (geometric centre point). Therefore, we will map the local regression coefficient estimates and assess each relationship's variability. In matrix form, at each location i, the local parameters will be estimated by the GWR as:

$$\hat{\beta}(i) = (X'W(i)X)^{-1} X'W(i)y \tag{3.2}$$

where X is the matrix of independent variables; y is the vector of the dependent variable; $\hat{\beta}_i = (\beta_{i0}, \ldots, \beta_{im})'$ is the vector of $m + 1$ local regression coefficient and W_i is the diagonal matrix of the geographical weighting of each observed data for the regression point i at location (u_i, v_i).

A crucial step for the GWR parameter estimation is selecting the spatial weighting function (Fotheringham et al., 2003). The construction of W_i involves two steps: one concerns the selection of the kernel function and the kernel type, while the second step deals with the bandwidth parameter used

in the kernel function to control the intensity of the weighting. In line with Tobler's law (Tobler, 1970), spatially closer observations tend to be more similar than those more distant. Therefore, we apply a kernel function to associate a distance-weight to each observation. For our analysis, we use the Gaussian kernel function, specified as:

$$w_{ij} = \exp\left(-\frac{1}{2}\left(\frac{d_{ij}}{b}\right)^2\right) \tag{3.3}$$

where the weighting scheme w_{ij} is a continuous function of d_{ij}; j represents a specific location at which data are observed and i represents any point in space for which parameters are estimated; b is the bandwidth of the function or, in other words, the radius of the sphere of influence for the location point i. The bandwidth parameter is the distance or the number of nearest neighbours.

We can also choose between the fixed and adaptive type of kernel function. The fixed type fixes a bandwidth parameter, and observations at each location point are weighted with the same intensity, depending on the distance from the calibration point. The adaptive version of kernel defines a nearest-neighbour bandwidth, and for each local regression, there will be the same number of observations but adapting the distance of nearest-neighbours at each location. The former type does not depend on the distribution of data, and for this reason, it may cause calibration issues; while the latter varies with the distribution of data and therefore, it is considered more able to deal with irregular study area or sparsely distributed data (Oshan et al., 2019). Fotheringham et al., 2009 clarify that the GWR estimates are not very sensitive to the weighting function's choice. However, they might be so when selecting the optimal bandwidth. The way to find the optimal kernel bandwidth involves the minimisation of a chosen model diagnostic criteria. We use the corrected version of the Akaike Information Criterion (AICc), as recommended by Fotheringham et al., 2001, which is sensitive to the sample size and will penalise smaller bandwidths, helping to guarantee more accurate results. For larger bandwidths, the GWR estimator will converge to the OLS estimator.

Notwithstanding, the fact that GWR assumes the same bandwidth for each relationship between the dependent and independent variable remains a limitation. The scale at which each relationship occurs may be different

for each of the considered variables. There are different ways to address this issue. A first alternative, which solves this problem only partly, is to run a Mixed (or semiparametric) GWR (Brunsdon et al., 1999). This model allows treating some relationships at a large (global) scale and other relationships at a smaller scale to distinguish between stationary and non-stationary relationships. The Monte-Carlo test (Hope, 1968) allows investigating the spatial non-stationarity of the variables. However, to fully overcome this limitation, another solution is to turn into a Multiscale GWR, meaning that there will be a specific bandwidth for each variable, defining the spatial scale at which each relationship occurs (Lu et al., 2017; Fotheringham et al., 2017). MGWR is an extension of the basic GWR, functioning like a generalised additive model (GAM) in which:

$$y = \sum_{j=1}^{k} f_j + \epsilon \tag{3.4}$$

At each j^{th} variable a smoothing function f_j is applied. To calibrate the model, the MGWR uses a back-fitting algorithm, in which a series of univariate GWR models are calibrated based on the partial residuals coming from the previous iteration, until the model converges to a solution (Oshan et al., 2019).

The following section defines the empirical setting, shows the results for both the Standard and Multiscale GWR, and then compares the models. The final section concludes.

3.3 Empirical framework and results

The empirical framework of this analysis involves the same scenario described in Chapter 2. In particular, we focus on the 2011-2016 election round, and on the three pillars of the EQI. The empirical strategy considers the results of the GWR model first; then, it turns to the MGWR results and at the end, both models are compared based on different criteria. Also, the residual spatial autocorrelation is tested. In this section, we show and comment on the model's results including the corruption pillar only, together with the other explanatory variables. For the sake of completeness, the results for the impartiality and quality pillars are displayed in Appendix B.[1]

[1] In Appendix B we display the summary statistics of all the analyses.

To conduct the empirical analysis, all the variables have been standardised, to be zero centred and have the same range of variation. Besides, in this framework, we consider collinearity not an issue, as already discussed in Chapter 2. Moreover, we also calculate the Variance Inflation Factor (VIF) for each variable, and values in Table B.1 in Appendix B are all below 10, therefore assumed to be uncorrelated (Belsley et al., 1980). Then, we calibrate the model: we opt for a Gaussian kernel function with an adaptive bandwidth selection, and we choose the AICc approach to find the optimal kernel bandwidth.

3.3.1 Standard GWR

When running the standard GWR, the model calibration finds an optimal bandwidth at $N = 19$ nearest neighbours, which is, therefore, the average spatial relationship scale. Figure 3.1 maps the local coefficients of each explanatory variable, displaying their spatial variation.

Each map exhibits how spatially heterogeneous the relationships between populist vote share and each explanatory variable are. Maps only display the regions where local parameters are significant (pseudo t-values +/- 1.96).[2]

In particular, we have that:

- the relationship between populist vote share and corruption, where significant and not statistically different from zero, is always negative. Higher negative coefficients are registered in regions belonging to Sweden, Finland, Denmark, Spain, and the United Kingdom, such as in Scotland. This relationship tells us that uncorrupted behaviours have a more substantial impact in reducing populist vote share. Indeed, the impact is reduced in regions where corruption is more present, like in Italy or eastern European countries.

- The relationship with economic resistance is also negative and significant, but in fewer regions. The sign of this relationship means that, in the mapped regions, and especially in the red ones, a higher capability to recover from the economic crisis has reduced the chance to support populist parties.

[2]Local pseudo t-statistics can be calculated as ratio between the estimated parameter and standard error. However, being a local spatial model, GWR suffer from the multiple hypothesis testing (Brunsdon and Charlton, 2011; da Silva and Fotheringham, 2016), therefore the statistical significance of local parameters should be considered exploratory and interpreted with caution.

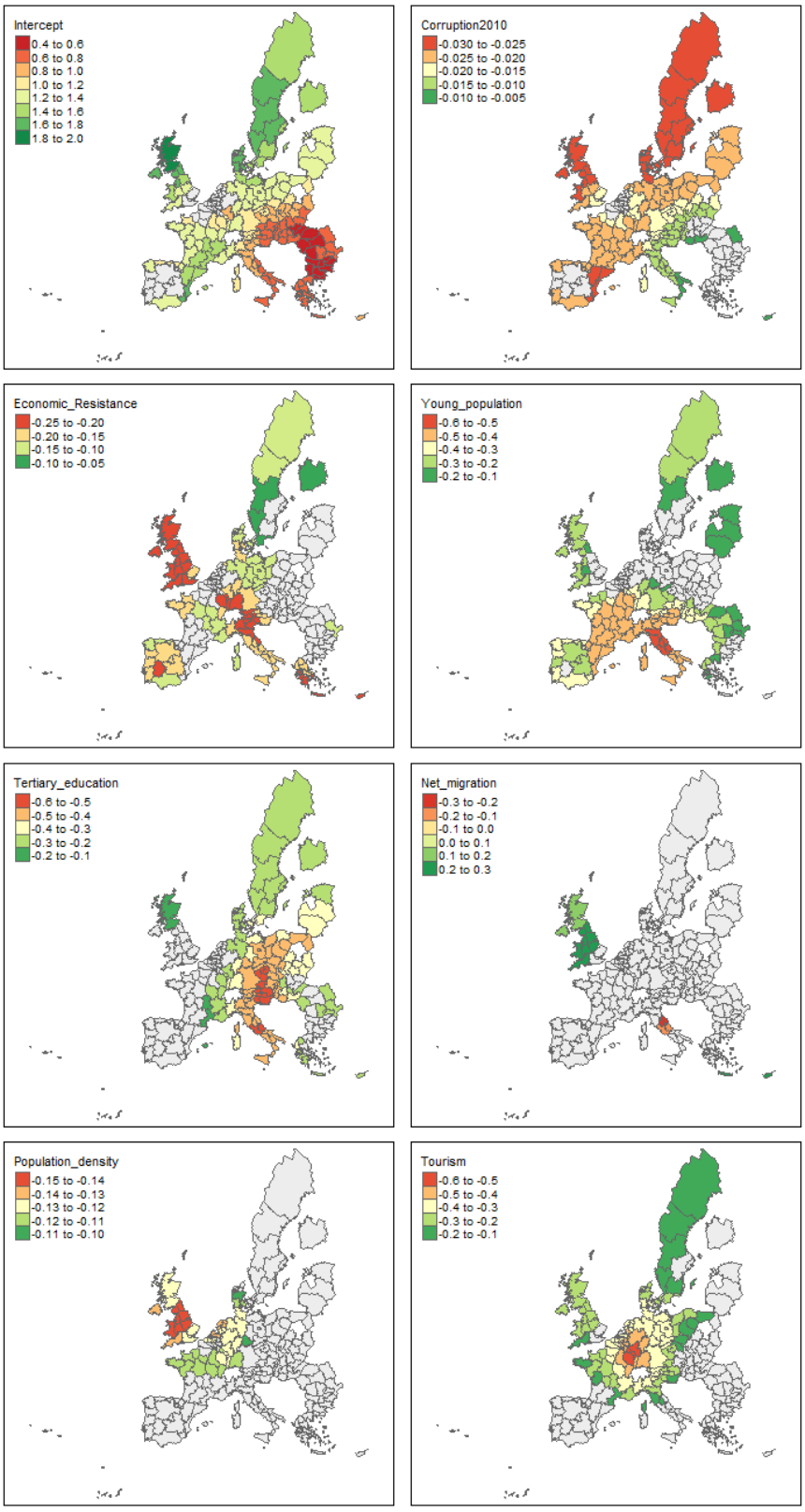


FIGURE 3.1: Standard GWR results

- The young population's share has a negative sign in many regions, except for those belonging to Poland, Czech Republic and northern countries where the coefficients are not statistically different from zero. Where significant, the presence of a young working population reduces the vote for populist parties.
- The tertiary education level has a negative and significant relationship with populist vote share, especially in central and eastern European regions. In these regions, the presence of more educated people contrasts the support for populist parties.
- The effect of net migration remains inconclusive. The local coefficients are statistically different from zero only in three Italian regions, with a negative sign, and in the United Kingdom, in almost all regions, with a positive sign.
- The population density map shows negative and significant coefficients in a few northern European regions. Therefore, more densely populated areas tend to support less populist parties.
- The tourism map shows negative and significant local coefficients, mostly in central and northern regions, similar to the population density's geography. Indeed, this result confirms the idea that regions registering higher numbers of tourists vote less for populist parties. The high impact in central European regions may reflect the presence of the many European institutions and the consequent high level of openness and multiculturalism.

3.3.2 Multiscale GWR

We now turn to the MGWR model. Indeed, the standard GWR has the main limitation to consider the same spatial scale for each variable. When running a MGWR model, we can have for each variable a specific scale (local or global) of influence related to the dependent variable. We follow the same empirical strategy as before: we calibrate the model through the Gaussian kernel function and the adaptive bandwidth selection, following the AICc approach. Then, we run the MGWR with the selected bandwidths.

The estimated bandwidths are at $N = 10$ nearest neighbours for the intercept, $N = 17$ for corruption, $N = 113$ for economic resistance, $N = 14$ for the share of young population, $N = 13$ for the share of tertiary education, $N = 10$ for net migration, $N = 206$ for population density and $N = 14$

for tourism. Given the maximum of 207 observations, economic resistance and population density have a more global relationship with the populist vote share. The local coefficients' sign is mostly similar to those shown in the Standard GWR maps, with some exceptions. However, we can see in the maps in Figure 3.2, that there is a different spatial variability. Analysing the results in detail:

- The populist vote's relationship with corruption is still negative but significant in all regions, confirming the institutions' crucial role in shaping the geography of discontent. The impact seems to slightly decrease from north to south, meaning that regions with higher institutional quality (i.e. less corruption) reduce the support towards populist parties. In southern and eastern regions, where the institutions tend to be more corrupt, the impact on the populist vote is less strong.

- Economic resistance's local coefficients are now considered at a more global scale and negatively impact populist vote share. Local coefficients decrease going from west to east, whereas in most Baltic regions and most eastern regions, coefficients are not statistically different from zero.

- The spatial impact of the young population's share on populist vote remains similar to the GWR. The highest negative local coefficients are registered in northern and central Italian regions, while eastern European regions' local coefficients are still not statistically different from zero.

- The share of tertiary education has a dual effect. It registers a positive and significant impact in Spanish and Portuguese regions, while in Italian and eastern European regions, it has a negative and significant effect on populist vote share, in line with the academic literature. Usually people with tertiary education tend to get better jobs and less reasons to vote for populist parties (Gordon, 2018). However, this might not be true in all regions and the spatial heterogeneity of the results reflect a worsening of the job allocation or the overall discontent of people.

- The share of net migration has still little influence and registers a negative relationship with the populist vote share in Italian and two French regions.

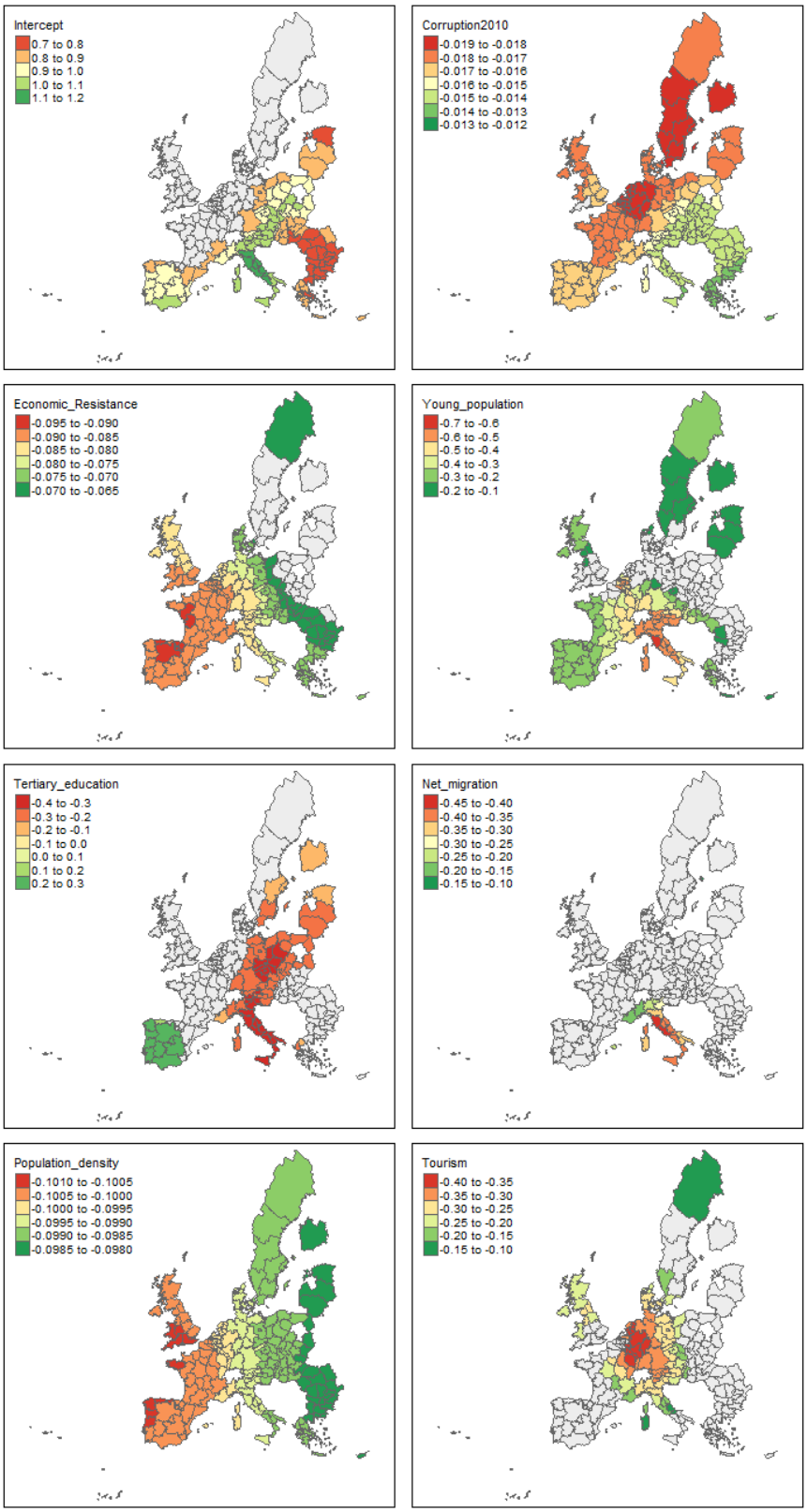


FIGURE 3.2: Multiscale GWR results

- From the population density map, we can see that it operates at a global scale and registers a negative and significant impact, which decreases going from west to east, but with minimal variations. Generally, more densely populated areas tend to vote less for populist parties.
- The map of tourism's local coefficients confirms the results of the standard GWR. There has been a slight decrease in the coefficients' size, but the impact on populist vote share remains negative and higher at the core of Europe.

3.3.3 Model comparison and diagnostics

Before discussing the results and concluding, we compare the models adopted so far. Overall, we have used the OLS model in Chapter 2, the standard GWR and the MGWR. To compare the three models, we show, in Table 3.1, the corrected AIC and the R^2 of each model.

TABLE 3.1: Model comparison

Model	**AICc**	R^2
OLS	443.7816	0.51
Standard GWR	379.9932	0.77
Multiscale GWR	357.0059	0.81

From the results in Table 3.1, we can see that the Multiscale GWR minimises the AICc value and the reach the highest R^2.[3] Though Jetz et al., 2005 recommends to look at the MGWR results in an exploratory way, as complementary to the OLS results, we can see that MGWR brings model improvements.

A further check is to test the spatial autocorrelation of residuals. To do so, we run the Moran's I statistic (Moran, 1948; Andrew and Ord, 1973), which test residuals' spatial dependence. From Table 3.2 we can see that the value of Moran's I for the Multiscale GWR is more negligible with respect to the correspondent values of the OLS and the standard GWR. Though the Moran's I is still significant at 5%, the problem is reduced and also the residuals' maps in Figure 3.3 display a spatial improvement. From the OLS to the MGWR,

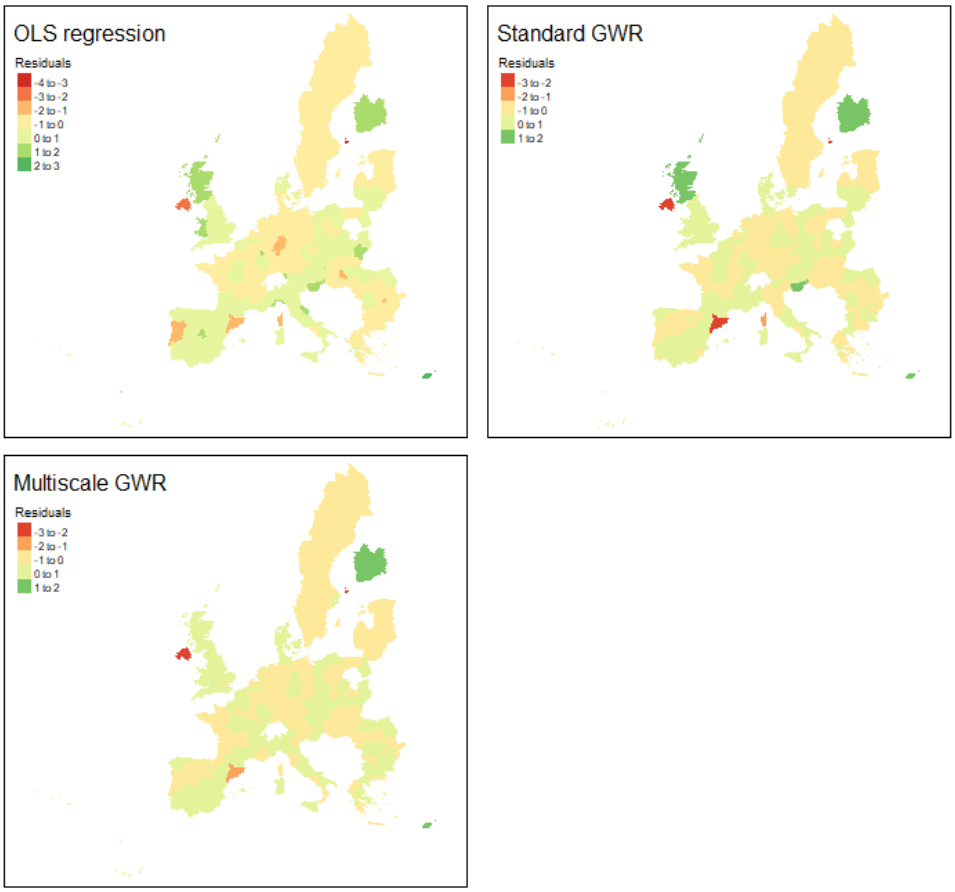
[3]The same happens looking at the results of the quality and impartiality pillars in Appendix B

the number of regions suffering from residual spatial autocorrelation is decreased; moreover, with further tests and analysis, it would be possible to deal with each problematic region and smooth the problem.

TABLE 3.2: Test for residuals' spatial autocorrelation

Model	Moran's I	p-value
OLS	0.299	0.000
Standard GWR	0.134	0.003
Multiscale GWR	0.102	0.018

FIGURE 3.3: Maps of residuals



Therefore, the Multiscale GWR approach improves the OLS results, complementing them with insights on the local dynamics between populist vote share and the dependent variables.

3.4 Conclusion

This chapter aimed at improving the traditional empirical framework used in the geography of discontent literature, introducing an existing tool, the GWR approach, to unveil territorial dynamics. Indeed, taking a geographical approach has multiple advantages. Surely, it sheds light on the territorial scale at which each variables' relationship takes place. It also answers to the urgent needs faced by institutions when addressing policies at sub-national levels (Ali et al., 2007).

Our analysis showed that the quality of institutions, i.e. corruption, can harm people's trust in institutions and push towards a shift in political preferences. However, these dynamics, and the role of economic and demographic variables, can depend and be related to the regional context. We have seen that people living in regions with higher institutional quality are less encouraged to vote for populist parties. If people have good experiences in their everyday life, they feel less frustrated, more satisfied with the system where they live, and populist parties have fewer arguments for the anti-elite political campaign.

Regional institutions are key to ensure the regions' development through the impartial allocation of resources and good public services. Empirical researches should be more and more "place-aware", so as to capture regional specificities and accurately address the territorial needs (Barca et al., 2012). Complementing the OLS approach taking a more geographical perspective might help and represent a little step forward to achieve this final goal.

Part III

4 Electoral earthquake: natural disasters and the geography of discontent

Chapter 4 advances the literature on the geography of discontent by showing that this geography is shaped not only by the role of long-term economic decline, but also by territorial scars generated by local unexpected shocks. Sudden and negative shocks can translate into sentiments of abandonment and frustration, which find their ultimate outlet at the ballot box. To do so, we focus on two major earthquakes that hit Italy in recent times: L'Aquila 2009 and Emilia 2012. This empirical work crosses also another strand of literature: the political science literature on natural disasters and retrospective voting. Having already discussed the geography of discontent literature in Chapter 1, we briefly review the second one, to contextualize the analysis's framework.

4.1 Natural disasters and retrospective voting

Albeit the literature on the geography of political discontent is flourishing, it is relatively recent. In this new strand, to the best of our knowledge, no one has yet considered the role of short-term shocks, such as natural disasters, in shaping this geography. In contrast, in the political science literature there is an older and considerable body of empirical work which looks at the electoral consequences of natural disasters or other exogenous or unexpected events. This literature has mainly focused on the relationship between natural shocks and the electoral fortunes of the incumbent governments, without taking into account the potential role of such events in triggering populist surges.

Indeed, citizens may use elections to express their satisfaction or dissatisfactions with the post-disaster measures, taken by the political class (Ashworth et al., 2018). Relevant studies demonstrate that citizens tend to blame the incumbent government when a natural disaster occurs, even if there is no rational basis, acting as 'blind' retrospective voters. Achen and Bartels, 2004 study the shark attacks occurred in 1916 in New Jersey and exhibit how citizens of that area showed meagre support to the incumbent president at the time of elections, compared to other voters, meaning that voters were retrospectively blind. Though the government had neither power nor responsibilities for that event, voters regardless decided to punish it. The study conducted by Heersink et al., 2017 on the Mississippi flood effect in 1927 concludes the same result. Despite the significant number of reconstruction grants, the effect on the incumbent president's re-election was unfavourable, especially in the lowest hit areas.

However, studies that demonstrate the opposite also exist. Healy and Malhotra, 2009 and Belloc et al., 2016 show that there are cases in which the support for the incumbent government increases. This outcome usually occurs when politicians use financial aids needed for reconstruction to attract voters and preserve their positions. Masiero and Santarossa, 2020 also find that being hit by the earthquake increase the incumbent's vote by more than 5%. Although the link between natural disasters and political participation may be affected by many specific features of the place and the democratic system, what seems to be confirmed is that, in most of the cases studied, citizens tend to question their political opinions on the government (Carlin et al., 2014). Natural disasters may affect voting behaviour depending on how the government deals with them, and on the political culture. The government might be considered responsible for both the prevention and the post-disaster measures, and voters might adapt their perceptions on the government, shifting their political preferences (Abney and Hill, 1966).

When natural disasters occur, citizens necessarily live unplanned and discomfort situations, making them more risk-tolerant, even many years after the disaster (Hanaoka et al., 2018). This condition could engender disappointment and more risky attitudes, associated with rising preferences towards populist parties, which usually propose riskier policies (compared to moderate candidates) to change the short-term situation (Panunzi et al., 2020). Unpredictable adverse shocks could thus reshape political beliefs and

push people to shift their preference to more radical or extremist candidates (Funke et al., 2016; Autor et al., 2020;S. Russo et al., 2020). The aim of this chapter is, indeed, to test this latest hypothesis.

4.2 The earthquakes

In this section, we present the socio-economic backgrounds and the specificities of the two disaster events used for our analysis: L'Aquila 2009 and Emilia 2012 earthquakes.

4.2.1 L'Aquila 2009

L'Aquila is a historic city and a university hub with a population close to 70,000, traditionally specialized in learning, public administration, and provision of services to the surrounding mountainous region (Alexander, 2019). Right before the 2009 earthquake, L'Aquila was not an economically vibrant territory, as the area was experiencing depopulation from rural areas and economic stagnation, with an unemployment rate above the national average (Pendall et al., 2010; Urso et al., 2019).

L'Aquila earthquake occurred on the night of the 6th April 2009 in the Abruzzi region in Central Italy, registering a 6.29 Mw magnitude on the Moment Magnitude Scale (MMS). The epicenter was Poggio di Roio (a fraction of L'Aquila municipality), 3.4 km to the southwest of the L'Aquila city center (Contreras et al., 2018). Overall, the quake affected 136 municipalities (89 if we consider only municipalities hit by a 'strong' shaking), caused 308 fatalities, left 67,500 people homeless and damaged at least 30,000 dwellings (Alexander, 2010b). The area struck by the earthquake is a densely populated territory, close to Gran Sasso in the Appennini chain, one of the most seismic European zones (Zullo et al., 2020). Figure 4.1 presents a map of the seismic intensity – measured on the Modified Mercally Intensity (MMI) scale [1] – experienced in the hit areas.

[1] While the MMS captures the power of an earthquake in terms of energy released (measured through its moment magnitude), intensity scales such as the MMI assess the effects of an earthquake. Each earthquake has only one magnitude (or a range of magnitudes, in some cases) which is measured using the MMS scale, while intensity scales like the MMI, which is based on observable earthquake damage, measure the amount of shaking at a particular location. An earthquake causes many different intensities of shaking in the area where it occurs, so the intensity of an earthquake will vary depending on the specific location (see https://www.usgs.gov/faqs/

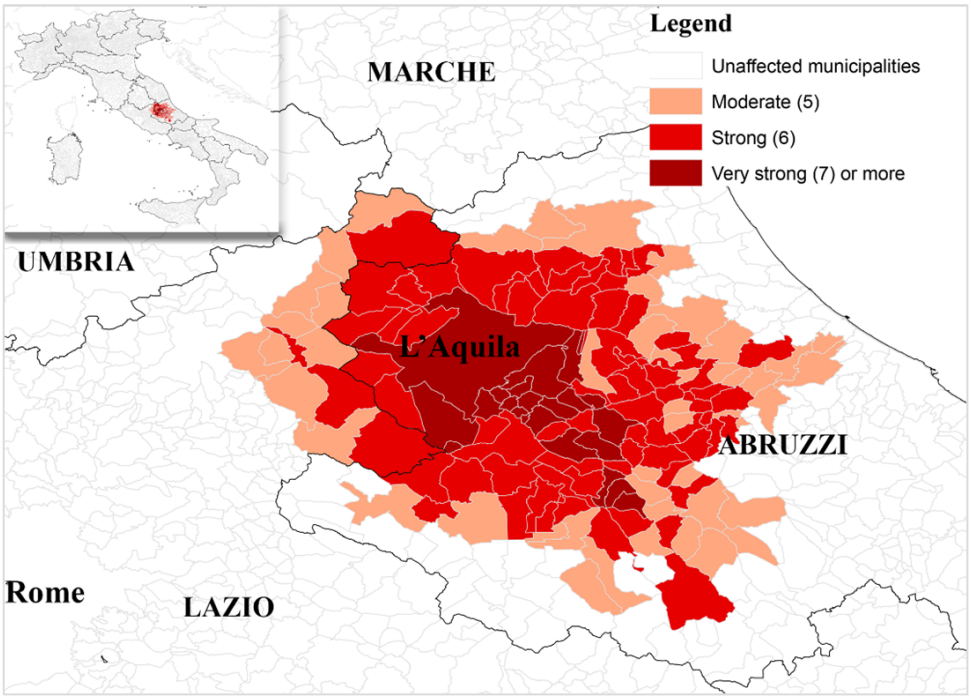


FIGURE 4.1: L'Aquila 2009 earthquake – Seismic intensity (MMI scale)
Author's elaboration on collected data

Notes: 47 municipalities were hit by a 'moderate' shaking, 69 municipalities were hit by a 'strong' shaking, and 20 municipalities were hit by a 'very strong' or higher shaking. The highest seismic intensity (9.5) was experienced in the municipalities of San Pio delle Camere and L'Aquila.

This medium power seismic event caused a very large amount of physical and economic damage (Alexander, 2019). The quake caused the loss of not only numerous historical buildings, but also more recent ones, such as the dormitory of the university of L'Aquila, where many students died that night, and brought to light the severe lack of adequate seismic risk prevention in the region (Rossi et al., 2012).[2] As for the economy, construction, services, and farming sectors were all severely hit, while employment and livelihoods suffered from substantial distress. In 2009, 16,000 jobs were lost in the province of L'Aquila (Alexander, 2019).

The disaster was followed by a heterogeneous reconstruction that lacked

what-difference-between-magnitude-and-intensity-what-modified-mercalli-intensity-scale?qt-news_science_products=0#qt-news_science_products for more information). Therefore, we will use the MMI scale to measure municipality-level damage generated by the earthquakes, in line with previous literature that also used Mercalli-type scales (Belloc et al., 2016; Masiero and Santarossa, 2020).

[2]See also here (in Italian): https://www.repubblica.it/cronaca/2012/05/20/news/sisma_l_aquila_magnitudo_6_3_emilia_magnitudo_6_ricercatore_cnr_eventi_simili_ma_molto_diversi-35552096/.

direction and connectedness (Contreras et al., 2018). This reconstruction process was centralized rather than participatory (Özerdem and Rufini, 2013), as local and regional duties were delegated to the national headquarters (Alexander, 2019). Government policy on the highly-publicized transitional shelters and temporary accommodation eventually led to isolation, social fragmentation and service deprivation (Alexander, 2013). Besides, the post-disaster management and recovery process were characterized not only by continuous bureaucratic delays, but also by repeated scandals such as corruption and manoeuvrability of mass media (Forino, 2015), as well as infiltration by organized crime.[3]

The earthquake was strongly politicized by the then Italian Prime Minister, Silvio Berlusconi, who visited the area many times, especially in the first months after the disaster, and made numerous promises related to reconstruction, pledging to resolve all problems in a few months (Özerdem and Rufini, 2013). For some scholars, Berlusconi exploited the centralized emergency management for his electoral tactics, using the reconstruction in L'Aquila to politically survive a decline in popularity (Alexander, 2010a; Forino, 2015). According to Özerdem and Rufini, 2013, one of the main barriers to an effective reconstruction process was Berlusconi's cult of personality, that led him to assume many key decisions without any consultation with the stakeholders.

A few years after the quake, affected people were living in a state of limbo and considered state institutions, which had reduced their presence to military personnel, as responsible, so much so that they even called the state relief effort "the second earthquake" (Bock, 2017). Alexander, 2013 summarizes the aftermath of the L'Aquila 2009 disaster as a disruptive event that led to further economic stagnation, stalled reconstruction, corruption and, ultimately, alienation of the local population.

[3] As reported by Imperiale and Vanclay, 2020, many official legal inquiries, including the European Parliament inquiry (Søndergaard, 2013), the National Anti-Mafia Department (Direzione Nazionale Anti-Mafia, DNA) (DNA, 2016), and the Parliamentary Commission of Inquiry into the Mafia (Bindi, 2018), confirmed that post-disaster activities were marked by extensive mafia infiltration, as well as by many irregularities and crimes against public administration.

4.2.2 Emilia 2012

On 20th May 2012 and on 29th May 2012, Emilia, in Northern Italy, was struck by two seisms. The two events measured, respectively, 6.09 Mw and 5.90 Mw magnitude on the MMS scale and involved the Emilian Po Valley, a flatland, mostly affecting the areas surrounding Ferrara, Modena, Mantova, Bologna and Rovigo.[4] Emilia, part of the Emilia-Romagna region, has always been a prosperous and economically dynamic area, one of the most productive of the country, and home to many active businesses and industrial and agri-food hubs, with a pre-earthquake unemployment rate below the national average. The territory hit by the quakes is densely populated, encompassing affluent municipalities, with a productive and industrial fabric open to international markets (M. Russo and Pagliacci, 2019). A crucial feature of this area is also the participatory and inclusive nature of its local governance, peculiar for its balanced mix between public and private interventions (Pagliacci and Russo, 2016).

The two quakes jointly caused a total of 28 fatalities and displaced about 16,000 people.[5] Figure 4.3 illustrates the seismic intensities experienced in the municipalities affected by the Emilian earthquake.

The harm to the area was significant, as the earthquake caused considerable damage to material infrastructures and intangible components, including major fractures to the local socio-cultural system which was based on the close interaction between businesses, public offices, and households (M. Russo and Pagliacci, 2019). The productive sector suffered extensive losses for approximately 5 billion Euro, causing substantial economic distress to the many industrial activities on the territory, especially those belonging to the manufacturing sector (Barone et al., 2013).

The Emilian productive system proved to be resilient in the face of the emergency (Barone et al., 2013). The reconstruction process, while not perfect, was rapid and efficient. According to M. Russo and Pagliacci, 2019, the Emilian reconstruction experience can be considered as a best practice in Italy. Post-earthquake recovery was facilitated by the particular model of local governance, characterized by a balance between public and private action. The reconstruction was able to reconnect people and places and implement extensive, systematic, and immediate measures to rebuild houses

[4] For simplicity, however, we refer to the Emilian earthquake as a single event.
[5] https://www.regione.emilia-romagna.it/terremoto/speciali.

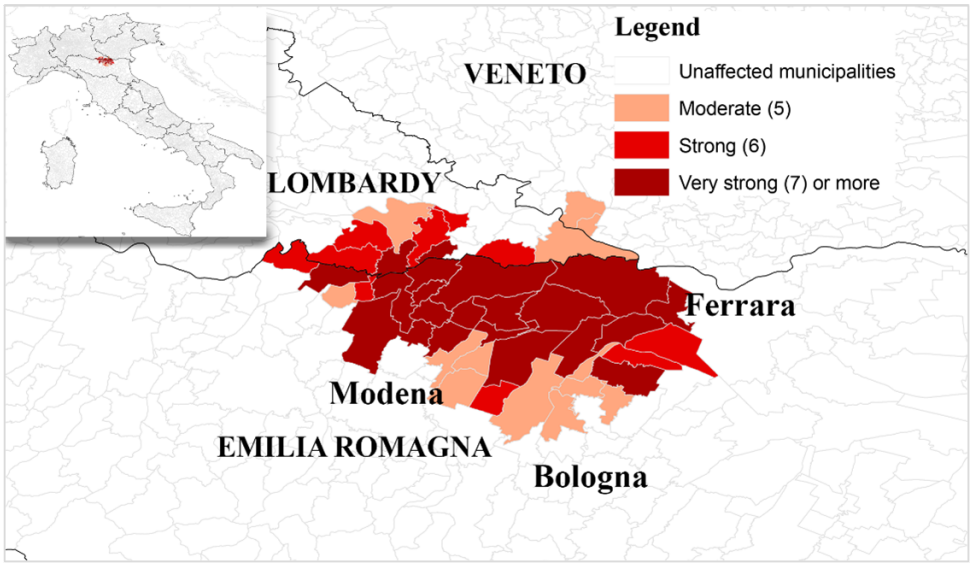


FIGURE 4.3: Emilia 2012 earthquake – Seismic intensity (MMI scale)
Author's elaboration on collected data

Notes: The map shows the maximum seismic intensity registered by each municipality. 13 municipalities were hit by a 'moderate' shaking, 10 municipalities were hit by a 'strong' shaking, and 20 municipalities were hit by a 'very strong' or higher shaking. The highest seismic intensity (8) was registered in the municipality of Cavezzo. For municipalities hit by both the 20th and 29th May earthquakes, the highest intensity is reported.

and productivity (Bianchi and Labory, 2014; Alexander, 2018).

In sum, the two earthquakes occurred one shortly after the other and had comparable physical magnitudes. The similarities, however, end here. Physical damages were substantially higher in the case of L'Aquila. L'Aquila is an economic backwater, Emilia an economic heartland (Alexander, 2018). Post-disaster management was inclusive in Emilia, and the recovery of the cultural and productive system rapid. L'Aquila reconstruction process was centralized, politicized, more infiltrated with corruption. In Emilia, people were actively involved in rebuilding their communities, in L'Aquila they became disengaged and alienated (Bianchi and Labory, 2014; Alexander, 2018).

4.3 Empirical approach

This section describes the dataset used and clarifies the methodology implemented for the analysis.

4.3.1 Data

We conduct the analysis using municipal-level data, built in a panel structure composed of eight non-consecutive time periods. As shown in Table 4.1, for each municipality, we collect the number of votes for each party and the voter turnout for the eight national (specifically, for the Chamber of Deputies) and European elections held during the time-span 2004-2019. In our framework, t defines election rounds, not years. This means that t is the first post-earthquake election round. Similarly, $t+1$ denotes the second post-earthquake election, $t-1$ denotes the last pre-earthquake election, and so on.

TABLE 4.1: Election rounds

Election round – L'Aquila 2009	Election round – Emilia 2012	Date	Type of election
t-3	t-4	Jun 2004	European
t-2	t-3	Apr 2006	National
t-1	t-2	Apr 2008	National
t	t-1	Jun 2009	European
t+1	t	Feb 2013	National
t+2	t+1	May 2014	European
t+3	t+2	Mar 2018	National
t+4	t+3	May 2019	European

The choice of restricting the analysis to national and European elections is rooted in the research hypothesis. Feelings of abandonment and frustration towards institutions are more likely to materialize at the ballot box of this kind of elections, whereas local (regional, and, especially, municipal) elections are characterized by a territorial component made of closer relationships between voters and candidates, and preferences might be driven by personal interests, rather than by voters' true sentiments and political beliefs (Barone and Mocetti, 2014). Besides, major natural disasters are almost

always addressed using resources from the central government. Therefore, it is unlikely that, under such circumstances, a voter would express her/his support for populism at municipal or regional elections.

Our outcome variable is the share of the authoritarian (right-wing) populist vote, computed following the classification introduced by Norris and Inglehart, 2019, based on the CHES.[6] As already described in Chapter 2, they built continuous standardised 0-100 scores for 268 political parties in Europe, 13 of which in Italy. We focus on the authoritarian component, which captures parties in favour of anti-immigrant policies, nationalist foreign policies, law and order, traditional values and against more liberal lifestyles (Norris and Inglehart, 2019). We build our outcome variable by multiplying the voting share of each party by its corresponding authoritarian score, and then we collapse them at the municipal level. We exclusively focus on the authoritarian and right-wing component for a number of reasons. First, when there are potentially societal threatening situations, such as economic crisis and terrorism, people tend to react in increasing authoritarianism, i.e. by supporting anti-democratic parties, to ask for external control (Kay et al., 2008). Similarly, previous literature (Funke et al., 2016; Colantone and Stanig, 2019; Panunzi et al., 2020) has emphasized that often right-wing parties gain consensus in the aftermath of sudden changes or adverse economic shocks. S. Russo et al., 2020 provide qualitative evidence that non-authoritarian individuals hit by a natural disaster increase their right-wing authoritarian attitude in the immediate post-disaster period. Lastly, the recent populist backlash seems to have taken a right-wing form (Rodrik, 2020), and populism now seems to be a distinctive element of the right in western Europe and especially in Italy (Di Matteo and Mariotti, 2020; Van Kessel, 2015).[7]

Earthquake data come from the National Institute of Geophysics and Vulcanology (INGV), which gathers the Macroseismic Data Point (MDP) registering the locality and the macroseismic intensity of each earthquake.[8] This database provides us with municipality-level intensity values that capture

[6] From now on, we will use the terms 'authoritarian' and 'right-wing' interchangeably.

[7] In the Appendix C, however, we report the estimates of the analysis on the average authoritarian-populist score as well as only the populist component of such score. Table C.1 in Appendix C provides the authoritarian and populist scores for all the parties included in the classification by Norris and Inglehart, 2019.

[8] The database is publicly available here: https://emidius.mi.ingv.it/CPTI15-DBMI15/. Albeit original values for the earthquakes were expressed in either EMS-98 or MCS scales, we interpret them on the MMI scale using the conversion guidelines provided by Musson et al., 2010

the physical damages generated by each earthquake as well as the level at which it has been felt by people (Locati et al., 2019). Our treatment variable is a dummy taking value 1 if the municipality has been affected by the earthquake with an intensity greater than 5. [9] We adopt this cutoff as it represents the threshold above which quakes generate physical damages, following Belloc et al., 2016 and Masiero and Santarossa, 2020. We then diversify the analysis and assess the separate effects of each earthquake at two different intensity cutoffs: i) 5.5 or 6, corresponding, on the MMI scale, to "strong" (I=6); ii) above 6, where the intensity ranges from "very strong" (I=7) to "violent" (I=9).

We also take into account the seismic risk associated with each municipality. We use the official classification introduced in 2003 (OPCM, 2003), which classifies municipalities in 4 classes of seismic risk, from 1 "high risk" to 4 "low risk", based on a calculation on the peak ground acceleration. In addition, we include a series of socio-economic variables for the treatment history, mostly collected from the Italian National Statistics Institute (ISTAT). To compare the labour structure among municipalities, we use the total number of employees in logarithmic form and the workplace employment rate. To account for the municipalities' economic variability and demographic structure, we include the average income per capita, the population size in logarithmic form, the population density, the share of old and young population and the share of net migration. The share of citizens with secondary education captures the educational level; the electoral turnout measures political participation. We also control for heterogeneity in the municipality construction heritage via the average age of the buildings. Table 4.2 presents summary statistics for all these variables, while Table C.2 in Appendix C provides their detailed description. Our final database is made up of 7,824 Italian municipalities.[10]

[9] As the Emilian earthquakes consisted of two seisms, for the municipalities affected by both we selected the one with the highest intensity.

[10] Out of a total of 7,914 municipalities, we only exclude the 74 municipalities belonging to the Aosta Valley region and other 16 municipalities with missing electoral data.

TABLE 4.2: Descriptive statistics

	Italian municipalities (7,824)				Municipalities affected by L'Aquila 2009 (89)				Municipalities affected by Emilia 2012 (30)			
Variable	Mean	s.d.	Min	Max	Mean	s.d.	Min	Max	Mean	s.d.	Min	Max
Average building age	1958	12.59	1918	1998	1947	12.74	1920	1985	1962	6.30	1937	1974
Electoral turnout	72.28	13.78	6.80	145.00	66.68	15.93	6.80	94.63	79.55	7.98	54.36	91.85
Income per capita (euro 2010)	16177	3815	5312	52810	13484	2368	7885	21286	18705	1408	14719	21848
Maximum intensity of Emilian seisms	0.033	0.452	0	8	0	0	0	0	6.497	0.68	5.5	8
Intensity of L'Aquila earthquake	0.1	0.761	0	9.5	6.152	0.895	5.5	9.5	0	0	0	0
Number of employees (log)	6.12	1.71	-0.19	13.84	4.99	1.44	-0.19	10.06	7.76	0.92	4.98	10.19
Population (log)	7.87	1.33	3.37	14.87	6.96	1.11	4.41	11.15	8.99	0.77	7.07	11.17
Population density	299.29	639.64	0.75	13055.61	55.71	69.72	3.26	536.52	197.09	97.68	81.35	549.59
Seismic risk classification	2.82	0.94	1	4	2.07	0.81	1	4	3.27	0.65	1	4
Share of authoritarian vote	47.75	12.96	0.00	86.00	44.16	13.99	9.02	70.79	43.80	12.84	16.36	65.06
Share of authoritarian-populist vote	47.73	14.67	0.00	82.00	44.51	16.25	8.41	69.73	45.92	15.47	14.69	65.68
Share of net migration	0.08	1.99	-33.71	23.39	-0.21	2.50	-15.97	9.72	0.61	1.38	-3.26	4.84
Share of elderly population (over 65)	22.91	5.98	4.36	66.23	28.61	7.98	15.73	62.50	22.29	2.59	16.12	29.23
Share of populist vote	47.71	18.07	0.00	92.00	44.87	19.86	7.81	76.89	48.04	18.98	13.02	68.12
Share of young population (18-24)	6.86	1.51	0.00	16.36	6.62	1.65	0	10.31	6.01	0.59	4.60	7.58
Share of secondary education	3.59	3.93	0.00	65.11	4.56	4.72	0	21.11	3.63	3.32	0.15	9.27
Workforce rate	33.35	23.47	0.00	435.06	26.18	13.87	0	91.53	47.95	13.98	20.36	83.89

4.3.2 Methodology

We adopt a comparative natural experiment approach, drawing on the fact that the timing of a large, sudden natural disaster is an exogenous event (Cavallo et al., 2013). The methodology implemented for our analysis is a non-parametric generalisation of the difference-in-differences estimator developed by Imai et al., 2020. By making use of time-series cross-sectional data (TSCS), even in settings with a limited number of pre-treatment periods, Imai et al., 2020 develop a flexible method in which multiple units can receive the treatment at different points in time and which is able to estimate robust short-term and long-term treatment effects.

We set the TSCS dataset with N units (municipalities) and T time periods (election rounds). For each unit $i = 1, 2, \dots N$ at time $t = 1, 2, \dots T$, we observe the outcome variable, the share of right-wing populist vote, Y_{it}; the treatment dummy variable X_{it} and a vector of observed covariates Z_{it}, for unit i at time t. Recall that, in our framework, t defines election rounds, not years. For the sake of simplicity, we will refer to t as the treatment period. Our setting requires covariates Z_{it} to refer to the period before the treatment X_{it}, which in turn must occur before the outcome variable Y_{it}. In addition, we set the number of leads (F) – the number of periods after the treatment – and lags (L), in order to calculate the average treatment effect for the treated (ATT) municipalities (i.e. those hit by the earthquake) as:

$$\delta(F, L) = E\Big\{Y_{i,t+F}(X_{i,t} = 1,\ X_{i,t-1} = 0,\ \{X_{i,t-l}\}_{l=2}^{L}) - Y_{i,t+F}(X_{i,t} = 0,\ X_{i,t-1} = 0,\ \{X_{i,t-l}\}_{l=2}^{L}) |\ X_{i,t} = 1,\ X_{i,t-1} = 0\Big\} \quad (4.1)$$

where the treated units are those municipalities hit by the earthquake. The expression $Y_{i,t+F}(X_{i,t} = 1,\ X_{i,t-1} = 0,\ \{X_{i,t-l}\}_{l=2}^{L})$ identifies the potential outcome in case of treatment, while $Y_{i,t+F}(X_{i,t} = 0,\ X_{i,t-1} = 0,\ \{X_{i,t-l}\}_{l=2}^{L})$ is the potential outcome when $X_{i,t-1} = X_{i,t} = 0$, in the absence of treatment. The rest of the treatment history, i.e. $\{X_{i,t-l}\}_{l=2}^{L} = \{X_{i,t-2}, \dots, X_{i,t-L}\}$, represents the realised history.

The implementation of this methodology requires four steps:

1. first, for each treated observation we have a matched set M_{it}, containing the control units sharing the same treatment history. We set $L = 3$ to better control for carryover effects. We restrict M_{it}, by implementing an

exact matching identification strategy, based on the seismic territorial classification.

2. We refine each M_{it} by using the Mahalanobis distance measure, i.e. given a control unit in M_{it}, we compute the standardised distance using the time-varying covariates and average it across time periods. In light of the parallel trend assumption, refining the matched sets allows us to control for past outcomes and time-varying covariates. We calculate the average Mahalanobis distance between each treated and each control observation over time as follows:

$$S_{it}\left(i'\right) \quad = \quad \frac{1}{L}\sum_{l=1}^{L}\sqrt{\left(V_{i,t-l}-V_{i',t-l}\right)^{T}\sum_{i,t-l}^{-1}\left(V_{i,t-l}-V_{i',t-l}\right)}, \quad (4.2)$$

where for a matched control unit $i \in M_{it}$, $V_{it'}$ is the time-varying covariates we are adjusting for, and $\sum_{it'}$ is its sample covariance matrix. Each treated unit is matched with the 5 most similar units in terms of Mahalanobis distance.

3. After refining the matched sets, we estimate the counterfactual outcome on the control units' weighted average in the refined matched set.

4. As a final step, we use the difference-in-difference estimator to calculate the ATT for each treated observation and then average it among all the treated observations. Adjusting for potential time trends, the ATT estimator becomes:

$$\hat{\delta}\left(F,L\right)=\frac{1}{\sum_{i=1}^{N}\sum_{t=L+1}^{T-F}D_{it}}\sum_{i=1}^{N}\sum_{t=L+1}^{T-F}D_{it}\left\{\left(Y_{i,t+F}-Y_{i,t-1}\right)-\sum_{i\in M_{it}}w_{i,t}^{i'}\left(Y_{i',t+F}-Y_{i',t-1}\right)\right\}, \quad (4.3)$$

where $D_{i,t}=\ X_{i,t}\left(1-\ X_{i,t-1}\right)1\left\{\left|M_{i,t}\right|>0\right\}$ and $w_{i,t}^{i'}$ is the non-negative normalised weight such that $w_{i,t}^{i'}\geq 0$ and $\sum_{i\in M_{it}}w_{i,t}^{i'}=1$.

Standard errors are computed using a block-bootstrap procedure built explicitly for matching analysis in TSCS settings (Otsu and Rai, 2017). The method relies on three assumptions:

- limited carryover effects. This assumption makes the potential outcome i at time $t+F$ not dependent on previous treatment status, up to L periods, i.e. $\{X_{i,t-l}\}_{l=L+1}^{L}$.
- no interference, i.e. the potential outcome of unit i at time $t+F$ is not dependent on the other units' treatment status, meaning that untreated neighbouring municipalities are not affected by the earthquake occurring in the treated ones.
- the parallel trend assumption, which is implied after conditioning on the set including treatment history, the lagged outcomes (except the immediate lag $Y_{i,t-1}$) and the covariate history $Z_{i,t}$:

$$
\begin{aligned}
E\Big[Y_{i,t+F}\left(X_{i,t}=0,\ X_{i,t-1}=0,\ \{X_{i,t-l}\}_{l=2}^{L}\right)-Y_{i,t-1}|X_{i,t}=1,\ X_{i,t}=0,\\
\{X_{i,t-l},Y_{i,t-l}\}_{l=2}^{L},\{Z_{i,t-l}\}_{l=0}^{L}\Big]=\\
E\Big[Y_{i,t+F}\left(X_{i,t}=0,\ X_{i,t-1}=0,\ \{X_{i,t-l}\}_{l=2}^{L}\right)-Y_{i,t-1}|X_{i,t}=0,\ X_{i,t}=0,\\
\{X_{i,t-l},Y_{i,t-l}\}_{l=2}^{L},\{Z_{i,t-l}\}_{l=0}^{L}\Big] \quad (4.4)
\end{aligned}
$$

These identifying assumptions are milder than those used by most common methodologies such as the linear regression model with fixed effects, dynamic panel models, matching methods, and the difference-in-differences estimator (Imai et al., 2020).

4.4 Results

For each earthquake, we present the sample selection, the covariate balancing, and the estimated treatment effects, first for the whole sample, then split by intensity levels.

4.4.1 L'Aquila 2009

For the L'Aquila earthquake, we have 89 municipalities hit by the 2009 earthquake with a "strong" or above seismic intensity, and a control group made up of municipalities from Central and Southern Italy (we consider the following ten regions: Tuscany, Umbria, Marche, Lazio, Abruzzi, Molise, Campania, Puglia, Basilicata and Calabria). We exclude municipalities from the islands and Northern Italy as they might differ in many unobservable ways from the affected municipalities. Besides, we further restrict the control group

by removing the 48 municipalities hit by the L'Aquila earthquake but with a smaller intensity ($<= 5$) and the 114 municipalities which were hit by the Central Italy earthquakes (occurring between 2016 and 2017), as they might not represent what would have happened to the 89 affected municipalities in the absence of the earthquake. We set $L = 3$ and $F = 4$. Figure 4.5 shows the balancing of the covariates, which remains stable across the 3 pre-treatment electoral rounds and fully within the $(-1, 1)$ range of the standard deviation. The level of imbalance for the lagged values of our primary dependent variable, that is, the share of authoritarian vote, stays relatively constant over the entire pre-treatment period, pointing to the plausibility of the parallel trend assumption for the proposed difference-in-difference estimator.

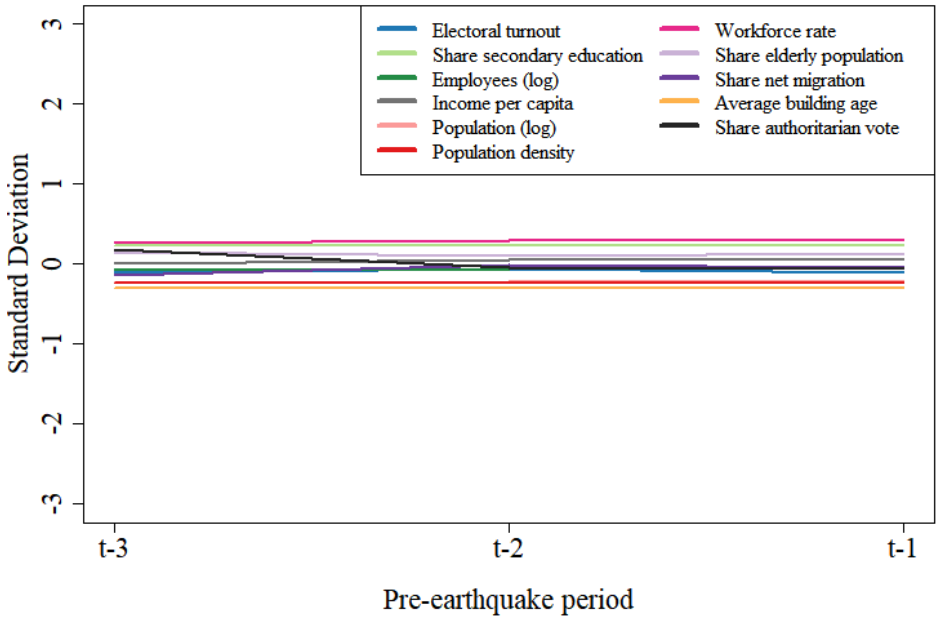


FIGURE 4.5: Covariate balancing for L'Aquila 2009

Table 4.3 shows the impact of the L'Aquila earthquake on the share of the right-wing populist vote. The estimates suggest a positive impact, statistically significant at the 5 or 1 confidence level for all periods considered.

We then split the analysis by intensity levels. The estimates are reported in Table 4.4. At the "strong" category, the estimates' extent gets smaller and we find no statistically significant results at the 5% level for the 2013 national elections $(t + 1)$ and the 2014 European elections $(t + 2)$. When considering only "very strongly" to "violently" affected municipalities, the impact becomes very large and always statistically significant at the 1 or 5% confidence level. The persistence of such electoral gains for right-wing populist

TABLE 4.3: Impact of L'Aquila 2009 on the right-wing populist vote share (%)

Intensity > 5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.86***	1.50**	1.46**	3.21***	4.26***
Block-bootstrapped SE	(0.60)	(0.62)	(0.69)	(0.67)	(1.20)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

parties, which are sizable even a decade after the earthquake, is remarkable, and consistent with the recent qualitative evidence suggesting that severe earthquakes can push individuals towards right-wing authoritarian attitudes (S. Russo et al., 2020).

TABLE 4.4: Impact of L'Aquila 2009 on the right-wing populist vote share (%) – By intensity levels

Intensity >5 and Intensity 6 (69 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	3.84***	1.13*	0.72	2.93***	3.77***
Block-bootstrapped SE	(0.64)	(0.67)	(0.74)	(0.73)	(1.32)
Intensity >6 (20 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	8.35***	2.76**	4.01***	4.20***	5.95**
Block-bootstrapped SE	(1.17)	(1.32)	(1.45)	(1.52)	(2.80)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

4.4.2 Emilia 2012

We perform the same analysis for the Emilia earthquake, for which we have 30 municipalities hit by the 2012 earthquakes with an intensity that caused physical damage. The control group is made up of municipalities from the same geographical area, i.e. Northern Italy (we consider the following eight regions: Piedmont, Liguria, Lombardy, Emilia-Romagna, Veneto, Friuli-Venezia Giulia and Trentino-Alto Adige/Südtirol), with the only exception of the 13 municipalities hit by the Emilian seisms with a smaller intensity ($<= 5$). Here the first post-treatment period, which we call t, corresponds to the 2013 national elections. In this case, we set $L = 3$ and $F = 3$. The covariate balancing is shown in Figure 4.6. All covariates display a stable balance across the

3 pre-treatment electoral rounds, remaining fully within the range $(-1, 1)$.[11] As before, the parallel trend assumption appears satisfied as the level of imbalance for the share of authoritarian vote stays relatively constant over the entire pre-treatment period.

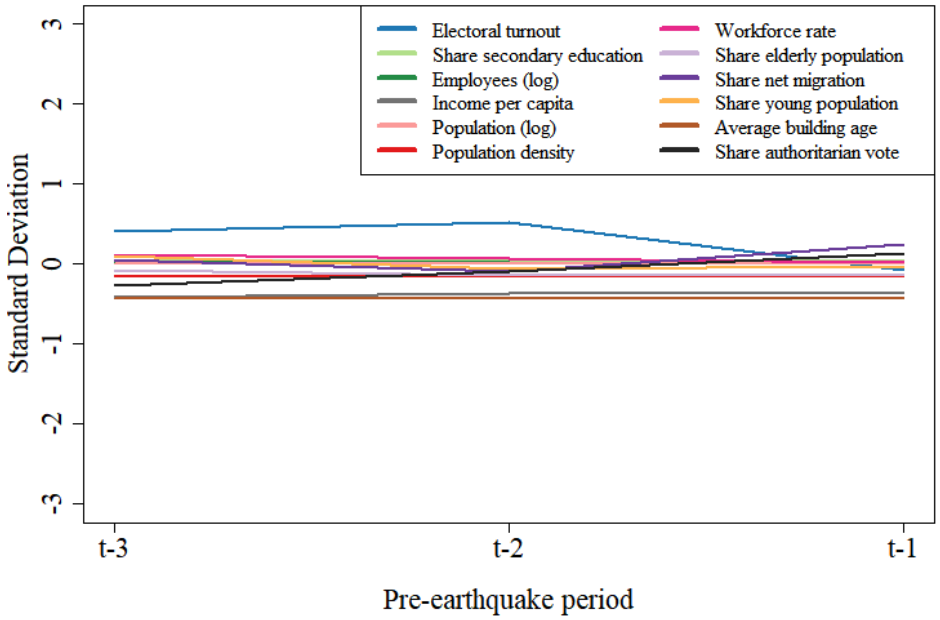


FIGURE 4.6: Covariate balancing for Emilia 2012

As for L'Aquila, we first consider all the municipalities hit by the earthquake. Table 4.5 reports close to zero and statistically insignificant estimates for all time periods.

TABLE 4.5: Impact of Emilia 2012 on the right-wing populist vote share (%)

Intensity >5 (30 municipalities)

Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.53	-0.50	-0.12	0.25
Block-bootstrapped SE	(0.79)	(0.69)	(0.30)	(1.31)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

In Table 4.6, we disaggregate the analysis and look at the different intensities. No new insights emerge: regardless of the intensity experienced, there is no significant impact whatsoever of the Emilian earthquake on right-wing populist voting.

[11] Only the control variable 'electoral turnout' exhibits a somewhat unstable pre-treatment balancing. In the robustness section, we will show that our results do not depend on this.

TABLE 4.6: Impact of Emilia 2012 on the right-wing populist vote share (%) – By intensity levels

Intensity >5 and Intensity 6 (10 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	0.30	-0.16	-0.29	0.04
Block-bootstrapped SE	(1.72)	(1.63)	(0.64)	(3.52)
Intensity >6 (20 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.94	-0.66	-0.03	0.36
Block-bootstrapped SE	(1.03)	(0.88)	(0.34)	(1.62)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

One may intuitively question the plausibility of our results by noting that Emilia has a long tradition of being a 'red stronghold', and that this explains the lack of post-earthquake rise in populism. But we do not compare the municipalities affected by the two earthquakes *between each other*. We compare each set of affected municipalities with *control* municipalities that are very similar under many aspects, including political preferences and previous electoral outcomes. Yet, in one case we observe very large treatment effects and in the other a total lack of impact. We also note that in the last round of regional elections (2020) the League party obtained an unprecedented share of votes (almost 32%) and, despite that, it was still considered a *defeat* for Salvini's party, who had seriously hoped for an historical win of the right-wing coalition in the region. This is a sign of how there have been profound changes in the Italian political landscape even in politically *stable* territories.

4.5 Additional analyses and robustness tests

We implement a battery of additional analyses and robustness checks to validate our results. Appendix C.2 contains the corresponding tables and figures.

- *Central Italy 2016-2017*: we perform the same analysis on the municipalities hit by the 2016-2017 Central Italy earthquakes, for which only two post-earthquakes election rounds are available. The estimates (Tables C.3 and C.4) point to a positive impact on the outcome variable, which is also statistically significant at the 1% confidence level for the 2018

elections. The results are thus more consistent with L'Aquila 2009 than with Emilia 2012. Note that, as illustrated in Figure C.1, the affected areas are much closer and more similar to the municipalities hit by the L'Aquila 2009 earthquake.

- *Removal of municipalities hit by other earthquakes*: 14 municipalities hit by L'Aquila 2009 were also hit by the Central Italy 2016-2017 earthquakes. Table C.5 reports the results of the analysis without these 14 municipalities. The positive impact of the L'Aquila earthquake remains statistically significant at the 1% level for the 2009 (t), 2018 $(t+3)$ and 2019 $(t+4)$ elections.

- *Placebo tests:* we run two in-space placebo tests. The first replicates the twofold analysis but takes as treated only municipalities registering an intensity equal to 5, corresponding to "moderate" on the MMI scale. Table C.6 shows that L'Aquila 2009 had a positive but smaller impact, significant at the 5% level, only for the 2009 European elections (t), while Emilia 2012 estimates point again to null effects. The second is inspired by Belloc et al., 2016 and Masiero and Santarossa, 2020: within each earthquake sample, we remove the treated municipalities and re-assign the treatment randomly at the same election time and to the same number of municipalities. The point estimates of these falsification tests, shown in Tables C.7 and C.8 are close to zero and show no discernible impact whatsoever.

- *Alternative neighbour numbers*: we change the number of the neighbours in the refined matched set. In Table C.9 we reduce the number of neighbours from 5 to 3 and in Table C.10 we increase such number to 10. In both cases the results are consistent with the main estimates.

- *Alternative matching methods*: we implement an alternative matching method to select the 5 control units, namely the propensity score matching (Rosenbaum and Rubin, 1983). The estimates in Tables C.11 and C.12 suggest that our results are stable and not very sensitive to the choice of the matching method used. Besides, we also report the covariate balancing of the propensity score matching in Figures C.4 and C.5. In particular, the more stable balancing of Emilia 2012 suggests that our main estimates are not sensitive to small pre-treatment imbalances occurring in the Mahalanobis covariate balancing.

- *Removal of distant regions from each sample*: we re-run the analysis for L'Aquila 2009 earthquake including only the regions that are closest to the location of the natural disaster, i.e. Abruzzi, Marche, Umbria, Molise, Lazio, and Campania, for a total of 1,532 municipalities. We did the same for Emilia 2012 considering Emilia-Romagna, Lombardy and Veneto, for a total of 2,371 municipalities. The outcomes, reported in Tables C.13 and C.14, confirm that our results are not driven by specific regional factors, which might be stronger in more distant regions.

- *Alternative outcome variables*: we test whether L'Aquila 2009 and Emilia 2012 earthquakes had an impact on the average authoritarian-populist score and on the populist component of such score. [12] The results in Tables C.15 and C.16 are in line with the hypothesis that there is a distinct relevance of right-wing populism in our setting.

Having established robustness, we now turn to the interpretation of our findings.

4.6 Mechanisms

What are the core drivers behind such strikingly heterogeneous results? Why did people affected by L'Aquila earthquake embrace right-wing populism as a reaction, but Emilian people did not? To frame our results, we explore an array of potential mechanisms by looking at both pre- and post-earthquake dynamics and by taking into account economic, political, material, social and institutional factors. All the tables reporting the estimates of the following tests are in Appendix C.3.

- *Pre-existing territorial disparities*: for L'Aquila 2009, a large impact is already observed at the 2009 European elections, only two months after the earthquake. Such an immediate populist upsurge may suggest that the earthquake's devastation brought to light pre-existing resentment in the population, i.e. discontent generated by territorial disparities. Indeed, as stated by Placanica, 1985, the earthquake does not overturn but consolidates the established order, it does not change but reinforces pre-existing tendencies and gaps. As described above, the two affected areas are characterized by structural differences in institutional contexts and economic characteristics, which in turn might have

[12] Cf. Table C.1 for the list of parties included in these different scores.

determined diverging post-disaster political trajectories. We test for this hypothesis by running a test in which, for each earthquake, we introduce a moderating variable capturing pre-existing medium-run economic trends: a dummy splitting the municipalities in those below and above the median of the average income growth over the 2000-2008 period.[13] The results reported in Tables C.17 and C.18, however, do not support this hypothesis: for L'Aquila, there is no clear differential trends in populist voting between areas with more and less favourable pre-earthquake economic dynamics; for Emilia, both sub-samples show no effects. Therefore, the earthquake did not simply act as an amplifier of pre-existing discontent.

- *Filtering out the "promise" effect*: an alternative mechanism to explain the immediate reaction, still pointing to the relevance of ex-ante channels, is that citizens immediately blamed institutions for the vast damages caused by the earthquake. A reaction caused by corruption and political favours, which led to a lack of prevention and safety standard in building activities. Indeed, there is qualitative evidence from a recent survey conducted in Amatrice (one of the hotspots of the 2016-2017 Central Italy earthquakes) that up to 29% of the surveyed individuals attributed the cause of the disaster to the central government, for the malpratice and lack of prevention in constructing buildings (Massazza et al., 2019). Nevertheless, there is also a political explanation for the sudden upsurge in right-wing populism: trust in the electoral promises made by the then-Prime Minister Silvio Berlusconi, leader of the populist party People of Freedom (a federation of right-wing political parties launched at the end of 2007 and led by Come on Italy and National Alliance). As explained in Section 4.2, L'Aquila earthquake was fervently politicized by Berlusconi who made many pledges and ensured people would get back to normal lives in a matter of months. We test these two alternative hypotheses by running the same analysis but using a different dependent variable: the share of votes for far-right wing populism using the classification by Rooduijn et al., 2019. [14] This classification does not include People of Freedom. The idea is that, if the

[13] The use of average growth as a proxy for economic trends is inspired by the recent work by Dijkstra et al., 2020

[14] Using this classification, we selected parties that identified with both the populist and far-right dimensions. In this classification, the 'populist' definition gathers parties fostering the divide between the pure people and the corrupt elite, while the 'far-right' definition includes nativist and authoritarian parties (Mudde, 2007).

initial outburst is due to blaming the central government for the lack of prevention, the voting pattern should be similar to the main estimates which include votes for People of Freedom. [15] If, instead, a 'promise' effect in favour of People of Freedom is at play, we should not observe this impact for far-right wing parties such as the League. Table C.19 suggests that the latter is the case: there is no impact whatsoever on the share of votes for far-right populism until the 2018 national elections.[16] The immediate populist reaction, therefore, was neither blaming the central government for the disaster nor a 'true' protest voting, but rather 'pocketbook' voting (see Elinder et al., 2015), in response to Berlusconi's paternalistic populism. Early populist support in the immediate aftermath was the fruit of hope, not of discontent. Discontent only arose when people became disillusioned by the initial pledges. This is also confirmed by the estimates in Table C.20, in which we focus on the positive impacts on the votes for People of Freedom/Come on Italy [17], which faded quickly and had disappeared by 2013. Having shown that initial effects are not related to ex-ante channels, but rather to a different composition and nature of the right-wing populist voting, we shift our attention to ex-post mechanisms.

- *Different seismic intensities*: the first ex-post mechanism is intuitive and easy to test. L'Aquila saw vaster damage compared to Emilia, and 5 municipalities (including L'Aquila city) experienced a seismic intensity on the MMI scale higher than 8, which is the maximum value registered for the Emilian earthquake. It could be, therefore, that the heterogeneous results are merely due to the fact that people in L'Aquila have been more severely affected. We re-ran the analysis for L'Aquila by excluding municipalities hit with intensity higher than 8. The results, reported in Table C.21, rule out this explanation: the populist effects are still large and statistically significant.

- *Economic impacts*: inequality in the economic effects of the earthquakes may then be the answer. We test for the ex-post economic channel by looking at the impacts of each quake on two economic variables: employment and income per capita. The estimates are in Tables C.22 and

[15] See Table C.1 for the list of parties included in this alternative variable.

[16] For the sake of completeness, for this and other checks we also report the results for Emilia 2012, even though we are mainly interested in L'Aquila ones.

[17] The party in 2013 switched back to the original Come on Italy denomination, but it has always been Berlusconi's party.

C.23. While no discernible pattern can be detected for employment, the income results are surprising: in L'Aquila (and, to a minor extent, in Emilia) real income per capita increased due to the earthquake, and significantly so, although the effect size is not large in absolute terms.[18] Even though these findings on the lack of employment effects or positive income impacts may seem counterintuitive, they can be contextualized in light of the following insights from the specialized literature: i) the seminal comparative study by Cavallo et al., 2013 found no effects on the evolution of per capita income even in the case of large disasters; ii) some studies document positive economic effects of natural disasters, due to reconstruction stimulus, industrial growth, favouring a mechanic rebound, triggered by the disaster (Cavallo, Noy, et al., 2011; Loayza et al., 2012); iii) the output dynamics following a quake can be considerably affected by the amount of post-quake financial aid that positively affects the GDP of local economies (Barone and Mocetti, 2014) – and this is especially the case when looking at smaller administrative entities such as municipalities; iv) a recent study (Porcelli and Trezzi, 2019) on the local evolution of output and employment following earthquakes from 1986 to 2011 (including also the L'Aquila event) found that economic impacts are small, transitory, and, in some cases, even positive, because the stimulus from reconstruction activities (financed by public grants) more than compensates for the destruction of physical capital. Given such features, it comes as no surprise that the discrepancies in populist support are not rooted in directly observable detrimental economic effects. To understand post-earthquake recovery, it is better to look directly at reconstruction dynamics.

- *Reconstruction patterns*: Section 4.2 provided qualitative evidence about how contrasting the reconstruction patterns of the two events have been. We now complement that discussion by offering descriptive and causal evidence that hint at a stark contrast in post-disaster management and in the speed of the reconstruction process. These aspects might be the key drivers behind the heterogeneous impacts. To this end, we scraped public and private fund reconstruction data from the respective Open data platforms of each earthquake. [19] These online platforms provide,

[18] We also tested for spatial spillovers and broader patterns in economic impacts by repeating the analysis at the local labor market level for both outcomes. The results are not reported but they are similarly inconclusive.

[19] Open data for L'Aquila come from Ufficio Speciale per la Ricostruzione dei comuni del Cratere (USRC) and are available here: http://www.usrc.it/attivita/

for each municipality, the amount of reconstruction funds allocated by the central government to that municipality and the amount of funds already disbursed by local institutions to implement the reconstruction projects. Thanks to this information, we were able to assemble, for each earthquake, variables capturing the municipality-level share of reconstruction fund disbursement completion, calculated as the percentage of the amount of fund paid over the total amount of funds assigned. We use these variables as proxies for the status of the reconstruction to depict two snapshots of the recovery processes, one as of 2017 (Figure 4.7) for public projects only, and the other from 2020 (Figure 4.9) for both public and private projects, by intensity levels of the affected municipalities. The pictures tell a clear story: despite occurring more than three years after L'Aquila, the Emilian earthquake has been followed by a much more rapid and smooth recovery, at comparable levels of damage severity. These variables can also be seen as a proxy for the quality of local institutions, under the assumption that better and more efficient local institutions are able to more rapidly employ the money received to carry out the reconstruction efforts.[20] Indeed, unequal institutional quality in the two affected areas may be a reason for such discrepancies: there is evidence from a comparative analysis of Italy's previous earthquakes that better pre-quake institutions might be more capable of managing the recovery and better allocating the inflows of public funds, avoiding improper use of financial aid (Barone and Mocetti, 2014). Indeed, considering pre-disaster years, the provinces hit by the Emilia earthquakes rank generally higher than the provinces hit by the L'Aquila seism, according to the institutional quality index put forward by Nifo and Vecchione, 2014. In addition to this descriptive *between-earthquake* evidence, we also offer *within-earthquake* estimates that are consistent with the notion that places where recovery was smoother and reconstruction faster were less prone to right-wing populist voting: Tables 4.7 and 4.8 present the results of a test in which,

ricostruzione-pubblica/monitoraggio-pubblica and here:https://opendataricostruzione.gssi.it/home.OpendataforEmilia-Romagna can be retrieved from here: https://openricostruzione.regione.emilia-romagna.it/.

[20]Seen in this light, our proxies are similar in spirit to the variable used to capture local institution quality by Albanese et al., 2019 and De Angelis et al., 2020, i.e. the number of days between the central state's deadline for the approval of a local tax and the date of adoption that changes at the municipality level, where the underlying assumption is that the sooner a local administration updates the rules on local taxation, the more efficient it is.

for each earthquake, we split the analysis by introducing, as a moderating variable, a dummy capturing whether a municipality lies above or below the median distribution of the 2017 share of public reconstruction fund disbursement completion. As the reader can see, there is evidence that, in the case of L'Aquila, in municipalities where post-disaster reconstruction was more rapid, the impact on voting behaviour is substantially smaller and less significant.[21]

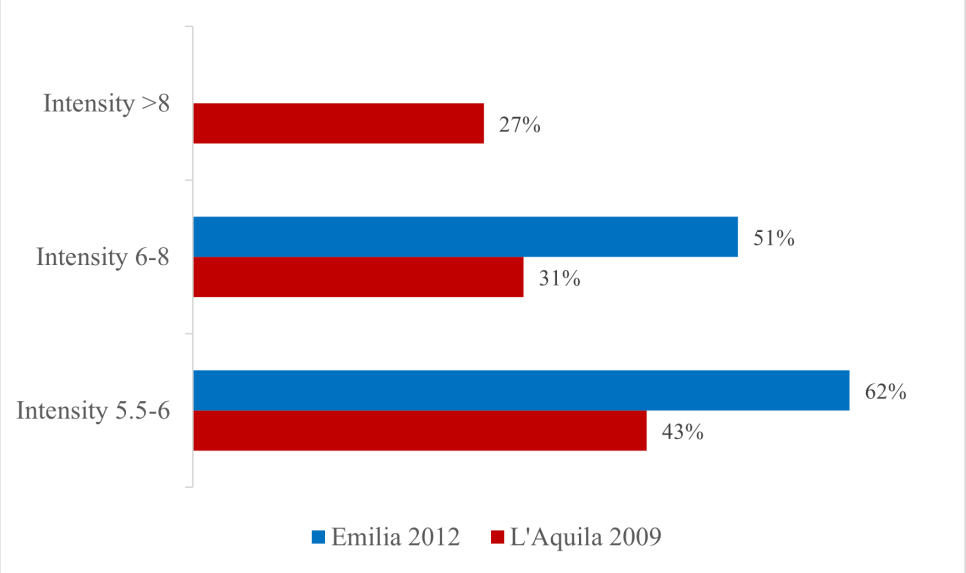


FIGURE 4.7: Share of reconstruction fund disbursement completion as of 2017 (%) Public projects only
Author's elaboration on collected data

Notes: L'Aquila data are available for 79 municipalities. Data are missing for 4 municipalities from Lazio (Amatrice, Borgorose, Borgo Velino, Fiamignano) and 6 municipalities from Abruzzi (Cerchio, Collepietro, Molina Aterno, Castiglione a Casauria, Civitaquana, Pietranico). Emilia provides data for a total of 25 municipalities, since the other 5 municipalities belong to Lombardy (Gonzaga, Pegognaga, Quingentone, Quistello, San Giacomo delle segnate). For L'Aquila, data in 2017 provides the work progress share, therefore we build the weighted share of reconstruction fund completion, calculated as the sum of the amount paid for each public project multiplied it by its work progress share, over the total amount of funds assigned, for each municipality. This measure gives us a picture of not only the fund completion but also on the reconstruction progress. For Emilia, the work progress share is not available and we use standard share of reconstruction fund completion of public projects.

[21] On top of this, the Pearson correlation between L'Aquila 2009 intensity and the share of public reconstruction fund disbursement completion is only 0.04, meaning that the stronger authoritarian support in less-reconstructed areas is not mechanically driven by the correlation between reconstruction and intensity levels.

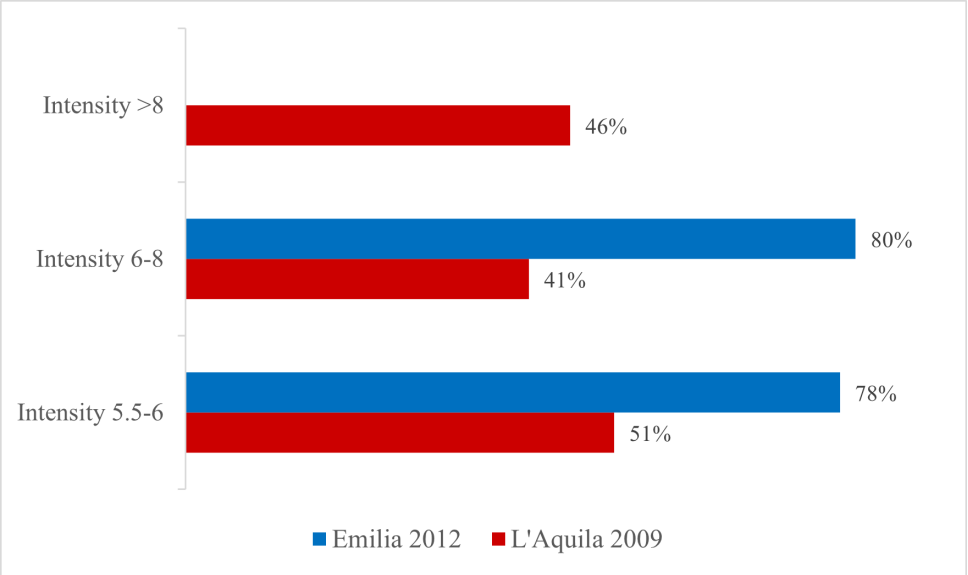


FIGURE 4.9: Share of reconstruction fund disbursement completion as of 2020 (%) Public and private projectsv
Author's elaboration on collected data

Notes: We lose several treated units when collecting data for both private and public projects. L'Aquila data are available for 57 municipalities: L'Aquila and the 56 municipalities inside the "crater" (the name by which became known the affected area). Data are missing for the 4 municipalities of Lazio region (Amatrice, Borgorose, Borgo Velino, Fiamignano) and the 28 municipalities considered "outside the crater" (Aielli, Celano, Cerchio, Collepietro, Magliano de' Marsi, Massa d'Albe, Molina Aterno, Ortona dei Marsi, Pratola Peligna, San Benedetto in Perillis, Scanno, Scurcola Marsicana, Secinaro, Basciano, castel Castagna, Cermignano, Crognaleto, Isola del Gran Sasso d'Italia, Alanno, Bolognano, Carpineto della Nora, Castiglione a Casauria, Civitaquana, Pianella, Pietranico, San Valentino in Abruzzo Citeriore, Tocco da Casauria). Emilia data refer to a total of 23 municipalities, since the remaining 7 affected municipalities belong to the Lombardy region (Gonzaga, Moglia, Pegognaga, Poggio Rusco, Quingentone, Quistello, San Giacomo delle segnate).

TABLE 4.7: Impact of L'Aquila 2009 on the right-wing populist vote share (%) – By median of the share of public reconstruction fund disbursement completion as of 2017 (%)

Intensity >5 (Below the median)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	7.37***	2.44*	3.20**	4.73***	6.56***
Block-bootstrapped SE	(1.16)	(1.33)	(1.47)	(1.45)	(2.24)
Intensity >5 (Above the median)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.25***	1.47**	0.50	2.51***	3.30**
Block-bootstrapped SE	(0.56)	(0.62)	(0.68)	(0.66)	(1.51)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

The number of treated units for L'Aquila is 79, as data are missing for 4 municipalities from Lazio (Amatrice, Borgorose, Borgo Velino, Fiamignano) and 6 municipalities from Abruzzi (Cerchio, Collepietro, Molina Aterno, Castiglione a Casauria, Civitaquana, Pietranico).

TABLE 4.8: Impact of Emilia 2012 on the right-wing populist vote share (%) – By median of share of reconstruction fund disbursement completion as of 2017 (%)

Intensity >5 (Below the median)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-1.31	-0.73	0.11	0.57
Block-bootstrapped SE	(1.31)	(1.18)	(0.41)	(2.12)
Intensity >5 (Above the median)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.14	-0.25	0.10	0.36
Block-bootstrapped SE	(1.34)	(1.11)	(0.54)	(2.20)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively. The number of treated units for Emilia 2012 is 25, as data for 5 municipalities are not available (Gonzaga, Pegognaga, Quingentone, Quistello, San Giacomo delle segnate, all belonging to Lombardy region).

- *Institutional trust*: finally, we complement the above findings with evidence that the mismanagement of the recovery process and the many corruption scandals and bureaucratic delays which characterized the aftermath of L'Aquila 2009, lowered citizens' trust in institutions. To capture this mechanism, we focus on the impact of the earthquake on electoral turnout at European elections. Turnout at European electoral rounds has been used in previous literature as a proxy for civic engagement, social capital, and institutional trust and quality (Guiso et al., 2004). While voting in general or local elections can lead to personal patronage benefits, namely an "exchange" rather than a measure of civic involvement, there are no immediate personal benefits in the case of European elections, for which, instead, the primary motivation can be considered a concern for public issues and a belief in the functioning of the political system (Barone and Mocetti, 2014). The estimates of Tables 4.9 and 4.10 are consistent with the idea that the mismanagement of the L'Aquila disaster generated distrust towards institutions: the impact on turnout at European elections in Table 4.9 is always negative, and, for 2009 and 2019, sizable and strongly significant.[22] The contrast with turnout impacts at national elections for L'Aquila and at

[22]The huge negative effects during the 2009 European elections could also be explained by the retrospective mechanism described by Massazza et al., 2019 for Amatrice in the aftermath

all elections in Emilia (Table 4.10) is remarkable. Importantly, these results are also in line with recent evidence that corruption scandals in Italy tend to lower institutional trust and, in turn, lead to populist support (Aassve et al., 2018). In sum, the contrasting electoral outcomes between the two earthquakes can be traced back to stark differences in the speed and management of post-disaster reconstruction process. The post-Aquila 2009 stalemate brought about distrust in the disappointed communities who, after the initial belief in Berlusconi's electoral promises, the repeated political and corruption scandals, the endless bureaucratic delays, saw their hope turn into discontent. The state's initially prompt engagement led to widespread hopes for a swift recovery, but soon, local expectations were shattered (Bock, 2017). Such narrative that emerges from our analysis is thus consistent overall with the historical background on the earthquakes and their aftermaths: one area did not recover, the other did; the former reacted by embracing right-wing populism, the latter did not.

TABLE 4.9: Impact of L'Aquila 2009 on electoral turnout (%)

Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Election type	**European**	**National**	**European**	**National**	**European**
Point estimates	-16.54***	1.07	-2.11	2.51***	-7.79***
Block-bootstrapped SE	(1.79)	(0.79)	(2.19)	(0.94)	(2.67)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

TABLE 4.10: Impact of Emilia 2012 on electoral turnout (%)

Intensity >5 (30 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Election type	**National**	**European**	**National**	**European**
Point estimates	0.78	0.85	1.21*	1.09
Block-bootstrapped SE	(1.01)	(1.44)	(0.66)	(2.04)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

of the Central Italy earthquakes. Citizens might have blamed the central government and the institutions for the lack of timely prevention in an area exposed to high seismic risk and for the lack of monitoring of malpractice and corruption in the construction sector, while, at the same time, believing in Berlusconi's paternalistic slogans.

4.7 Conclusion

Not all shocks leave the same scars. The comparative analysis implemented in this chapter, showed that places and people can turn to authoritarianism and populism not just if 'left behind' by long-run economic trajectories related to global transformations, but also in reaction to the lack of territorial resilience in the aftermath of local shocks. Populist upsurges can thus be unanticipated, not necessarily gradual and predictable.

The geography of discontent emerging after L'Aquila 2009 was shaped by the inability of institutions to cope with the new, unexpected challenge, ensure a prompt recovery and set in motion a smooth reconstruction process. Leaving a community not represented and economically behind from the rest of the country triggers grievances and frustrating sentiments (McKay, 2019). Indeed, the impasse, coupled with the scandals and organized crime infiltrations, engendered distrust towards public institutions, alienation, feelings of abandonment and resentment and, ultimately, revenge through the ballot box. The failure to rebuild places translated into a failure to rebuild local communities, so those communities looked for someone else to address their unfulfilled claims and reinvigorate their hopes.

The policy lesson is clear: in a world in which right-wing populism is on the rise, mismanaging shocks can have a high political cost, and lead to social fragmentation, extremism, and authoritarianism. In this respect, the finding that even "places that don't recover" can become populist hotbeds resounds as a urgent warning of the potential electoral and political repercussions of the ongoing pandemic crisis.

Further research developments

This brief section provides some future potential developments to complement and enrich the analyses conducted in this thesis.

Chapter 2 might further explore the role of institutions on populist vote, distinguishing between the direct effect of the institutional quality and the indirect effect of having a poor institutional quality deriving from the economic sphere, i.e. due to the economic crisis.

In Chapter 3 the GWR analysis might be enriched by embedding the Instrumental Variable approach, as the analysis in Chapter 2, to test the robustness of the results. Moreover, the analysis should be completed with a more insightful interpretation of the results, giving a more accurate representation of the territorial contexts involved.

The analyses conducted in Chapter 4 might be further refined narrowing the control group of each case study. This step would allow to compare the treated units with very similar municipalities (i.e. belonging to the same region) and therefore have a further test on the result that units that don't recover react voting for right-wing populist parties. Besides, in my future research endeavors, I would like to explore whether other types of exogenous shocks (e.g., other types of natural disasters or the arrival of a pandemic), would lead to similar voting patterns.

Conclusion

In a Europe heavily hit by the financial and debt crisis, traditional parties have failed in representing people's needs and requests. Populist parties, in contrast, have gained new attention. From both left- and right- wings, they re-focused the attention towards the people, blaming the incumbent government for having forgotten their economic and social issues. Citizens have lost their political trust in the existing institutions, and they poured their prolonged discontent in the ballot box, voting for populist parties.

The thesis enriches the existing literature of the "geography of discontent" adding new insights on the role of institutions in shaping political preferences, which act as a key driver of political resentment. We have demonstrated that when people perceive that institutions fail to allocate resources, or to manage sudden shocks, such as earthquakes, people's political trust ends up being harmed. The loss of trust in institutions translates into a loss of trust in traditional social and democratic parties, revealing the everyday frustration and distress people experience. These reactions are at the roots of the increasing support gained by populist parties, as a manifest sign of widespread discontent.

This mechanism happens to be true in both contexts of analysis examined in the thesis. Concerning European regions, Chapter 2 and 3 demonstrate that high-quality regional institutions guarantee the functioning of the existing democratic system, contrasting the spread of feelings of fear and frustration. Having a good institutional quality impacts at the local level and acts as a guarantor of the whole local and territorial development.

Indeed, political discontent is often the by-product of local economic, institutional, and demographic decline. As shown in Chapter 4, this decline can be sudden and unanticipated rather than gradual and predictable. The last part of this thesis emphasises that not just "places that don't matter" (Rodrıguez-Pose, 2018), but also "places that don't recover", can become populist hotbeds.

These results shed new light on the determinants shaping the political preferences and make the evolution of the geography of discontent literature

more uncertain, placing additional burden and responsibility on the role of institutions in managing local recovery and ensuring territorial resilience.

A Appendix to Chapter 2

A.1 Variable details

TABLE A.1: Definition of the variables included in the analysis

Variable name	Definition	Time period	Source
Economic resistance	Diffference between changes in employment rate at the regional level and changes in employment rate at national level, over the change at national level. Changes are calculated between 2008 and 2013	2008; 2013	Eurostat
EQI - Corruption pillar	Corruption pillar of EQI, min-max (0-100) standardized	2010; 2013; 2017	The Quality of Government Institute, University of Gothenburg
EQI - European Quality of Institution	EQI index, min-max (0-100) standardized	2010; 2013; 2017	The Quality of Government Institute, University of Gothenburg
EQI - Impartiality pillar	Impartiality pillar of EQI, min-max (0-100) standardized	2010; 2013; 2017	The Quality of Government Institute, University of Gothenburg
EQI - Quality pillar	Quality pillar of EQI, min-max (0-100) standardized	2010; 2013; 2017	The Quality of Government Institute, University of Gothenburg
EQI 1997	The EQI integrated with the World Bank Governance Indicators (WGI) - 4 pillars: effectiveness of regional government and bureaucracy, rule of law, accountability of the regional administration and strength of democracy and level of corruption	1997	Kauffmann et al. (2009) and Charron et al. (2014)
Population density	Total population over the regional area in squared kilometres	2010; 2013	Eurostat
Share of authoritarian vote	Share of votes weighted by authoritarian scores	2011-2019	National sources & Norris and Inglehart (2019)
Share of authoritarian-populsit vote	Share of votes as a weighted average of authoritarian and populist scores	2011-2019	National sources & Norris and Inglehart (2019)
Share of net migration	Crude rate of net migration plus statistical adjustment	2010; 2013	Eurostat
Share of populist vote	Share of votes weighted by populist scores	2011-2019	National sources & Norris and Inglehart (2019)
Share of young population	Percentage of 15-24 people over 15-64 aged population	2010; 2013	Eurostat
Share tertiary education	Percentage of 25-64 aged population with tertiary educational level	2010; 2013	Eurostat
Tourism	Percentage of total nights spent in tourist accommodation (hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks)	2010; 2013	Eurostat

TABLE A.2: Populist scores in European party - from Norris and Inglehart, 2019

Country	Party name	Populist score	Country	Party name	Populist score
Austria	Austrian People's Party	20	**Czech Republic**	Civic Democratic Party	27
	Social Democratic Party of Austria	25		Czech Social Democratic Party	34
	Alliance for the Future of Austria	59		Christian Democratic Union	41
	The Austrian Green Party	66		Communist Party of Bohemia and Moravia	57
	Freedom Party of Austria	67		Party of Free Citizens	66
	The New Austria	68		Green Party	66
	Team Stronach	79		Action of Dissatisfied Citizens	83
				TOP 09	36
Belgium	Reformist Movement	24		Dawn of Direct Democracy	92
	Christian Democratic and Flemish	26			
	Humanist Democratic Centre	26	**Denmark**	Danish Social Liberal Party	17
	Francophone Democratic Federalists	45		Conservative People's Party	24
	Green	47		Liberal Party of Denmark	25
	Ecolo	47		Social Democrats	26
	New Flemish Alliance	53		Liberal Alliance	27
	People's Party	60		Socialist People's Party	27
	Socialist Party	25		Red-Green Alliance	47
	Workers' Party of Belgium	73		Danish People's Party	48
	Socialist Party Different	29		People's Movement Against the EU	52
	Flemish Interest	75			
	Open Flemish Liberals and Democrats	24	**Estonia**	Estonian Reform Party	31
				Pro Patria and Res Publica Union	36
Bulgaria	Movement for Rights and Freedoms	37		Estonian Center Party	41
	Left Bulgaria	45		Social Democratic Party	47
	Alternative for Bulgarian Revival	61		Estonian Greens	78
	Bulgaria for Citizens Movement	63		Estonian Free Party	80
	Strong Bulgaria	63			
	Bulgaria without Censorship	81	**Finland**	National Coalition Party	20
	Attack	83		Swedish People's Party	24
	Citizens for European Development	58		Social Democratic Party	29
	National Front for the Salvation of Bulgaria	76		Christian Democrats	32
	Union of Democratic Forces	62		Finnish Center Party	36
	Bulgarian National Movement	79		Green League	46
				Left Alliance	51
Cyprus	Democratic Rally	56		True Finns	81
	Democratic Party	56			
	European Party	61			
	Movement for Social Democrac	71			
	Party of Working People	71			
	Ecological and Environmental Movement	77			

TABLE A.3: Populist scores in European party - from Norris and Inglehart, 2019

Country	Party name	Populist score	Country	Party name	Populist score
France	New Center	32	**Hungary**	Fidesz - Hungarian Civic Union	39
	Centrist Alliance	33		Hungarian Socialist Party	47
	Democratic Movement	52		Democratic Coalition	63
	French Communist Party	55		Together 2014	69
	The Greens	58		Politics Can Be Different	82
	Movement for France	66		Movement for a Better Hungary	87
	Together	73			
	Left Party	83	**Ireland**	Family of the Irish	27
	National Front	89		Labour	29
	Radical Party of the Left	37		Soldiers of Destiny	30
	Radical Party	38		Green Party	52
	Socialist Party	35		We Ourselves	60
	Union for Popular Movement	33		Socialist Party	65
				People Before Profit Alliance	66
Germany	Christian Democratic Union of Germany	19			
	Free Democratic Party	22	**Italy**	Union of the Centre	34
	Christian Social Union in Bavaria	22		Come on Italy	37
	The Greens	33		New Centre-Right	37
	The Left	44		Civic Choice	41
	Alternative for Germany	59		Aosta Valley	46
	National Democratic Party of Germany	62		South Tyrolean People's Party	49
	Pirate Party of Germany	67		Democratic Centre	50
	Human Environment Animal Protection	74		Democratic Party	58
	Social Democratic Party of Germany	22		Brothers of Italy	62
				Left Ecology Freedom	71
Greece	New Democracy	35		Northern League	78
	Socialist Movement	39		Communist Refoundation Party	92
	Democratic Left	60		Five Star Movement	100
	The River	69			
	Popular Orthodox Rally	76	**Latvia**	Union of Greens and Farmers	47
	Syriza Coalition of the Radical Left	84		Unity	52
	Independent Greeks	85		Social Democratic Party "Harmony"	58
	Popular Association—Golden Dawn	91		National Alliance "All For Latvia!"	61
	Communist Party of Greece	94		Latvian Association of Regions	76
				Latvian Russian Union	80
				For Latvia from the Heart	87
Lithuania	Social Democratic Party	34	**Poland**	Civic Platform	30
	Liberal Movement	41		Polish People's Party	31
	Labour Party	42		Democratic Left Alliance	36
	Lithuanian Christian Democrats	44		Your Movement	56
	Electoral Action of Lithuania's Poles	54		Poland Together	70
	Lithuanian Peasant and Greens Union	56		Law and Justice Party	83
	The Way of Courage	91		United Poland	84
	Order and Justice	71		Congress of the New Right	91
Luxembourg	Christian Social People's Party	26	Portugal	People's Party	26
	Democratic Party	51		Social Democratic Party	27
	Luxembourg Socialist Workers' Party	56		Socialist Party	38
	The Greens	69		Democratic Unitarian Coalition	78
	Alternative Democratic Reform Party	87		Left Bloc	79
	The Left	87		Earth Party	80
Malta	Labour Party	32	**Romania**	Conservative Party	34
	Nationalist Party	63		National Union for the Progress of Romania	34
				Social Democratic Party	36
Netherlands	Political Reformed Party	11		Hungarian Democratic Union of Romania	43
	Christian Democratic Appeal	14		National Liberal Party	50
	Labour Party	14		Democratic Liberal Party	56
	Democrats 66	16		People's Movement Party	60
	Party for Freedom and Democracy	16		People's Party—Dan Diaconescu	79
	Green Left	18			
	ChristianUnion	18			
	Party for the Animals	37			
	50PLUS	42			
	Socialist Party	51			
	Party for Freedom	74			

TABLE A.4: Populist scores in European party - from Norris and Inglehart, 2019

Country	Party name	Populist score	Country	Party name	Populist score
Slovakia	Social Democracy	38	**Sweden**	Moderate Party	18
	Party of the Hungarian Coalition	47		Liberal People's Party	19
	Christian Democratic Movement	49		Christian-Democrats	20
	Slovak Democratic and Christian Union	50		Social Democratic Party	20
	Most-Hid Bridge	50		Center Party	20
	Slovak National Party	60		Environment Party—The Greens	29
	Freedom and Solidarity	66		Left Party	38
	Network	69		Feminist Initative	50
	New Majority	69		Pirate Party	59
	Ordinary People and Independent Personalities	87		Sweden Democrats	60
Slovenia	Democratic Party of Pensioners of Slovenia	55	**United Kingdom**	Conservative Party	27
	Positive Slovenia	57		Liberal Democratic Party	34
	Alliance of Alenka Bratušek	57		Labour Party	39
	Social Democrats	59		Party of Wales	50
	Slovenian People's Party	61		Scottish National Party	57
	Party of Miro Cerar	68		Green Party	65
	Slovenian Democratic Party	69		United Kingdom Independence Party	82
	New Slovenia-Christian People's Party	69			
	United Left	79			
Spain	People's Party	25			
	Convergence and Union	27			
	Basque Nationalist Party	27			
	Basque Solidarity	30			
	Canarian Coalition	31			
	Republican Left of Catalonia	45			
	Spanish Socialist Workers' Party	47			
	Galician Nationalist Bloc	57			
	Amaiur	57			
	Party of the Citizenry	74			
	Initiative for Catalonia Greens	64			
	United Left	67			
	Progress and Democracy	75			
	Podemos	100			

TABLE A.5: Correlation table for 2011-2016 election round, variables at 2010

	Populist vote 2011-2016	EQI 2010	Corruption 2010	Quality 2010	Impartiality 2010	Economic resistance	Young population	Tertiary education	Net migration	Population density	Tourism	EQI 1997	Corruption 1997	Quality 1997	Impartiality 1997
Populist vote 2011-2016	1														
EQI 2010	-0.6	1													
Corruption2 010	-0.62	0.97	1												
Quality 2010	-0.57	0.97	0.91	1											
Impartiality 2010	-0.56	0.97	0.92	0.91	1										
Economic resistance	-0.32	0.09	0.1	0.04	0.12	1									
Young population	-0.27	-0.09	-0.06	-0.05	-0.15	0.11	1								
Tertiary education	-0.39	0.5	0.48	0.51	0.46	-0.13	-0.1	1							
Net migration	-0.15	0.26	0.29	0.25	0.23	0.22	-0.2	0.29	1						
Population density	-0.07	0	0.02	0.01	-0.02	0.1	-0.1	0.29	0.33	1					
Tourism	-0.12	-0.03	-0.02	-0.02	-0.04	0.17	0.1	-0.22	-0.19	-0.38	1				
EQI 1997	-0.49	0.96	0.94	0.92	0.94	0.05	-0.2	0.48	0.29	0	0.02	1			
Corruption 1997	-0.58	0.94	0.97	0.88	0.9	0.12	-0.1	0.45	0.3	0.03	0.02	0.96	1		
Quality 1997	-0.46	0.93	0.88	0.89	0.93	0.04	-0.3	0.53	0.3	0	0.01	0.97	0.89	1	
Impartiality 1997	-0.36	0.81	0.8	0.83	0.74	-0.08	-0.3	0.46	0.28	0.08	-0.08	0.89	0.82	0.83	1

TABLE A.6: Correlation table for 2015-2019 election round, variables at 2013

	Populist vote 2015-2019	EQI 2013	Corruption 2013	Quality 2013	Impartiality 2013	Economic resistance	Young population	Tertiary education	Net migration	Population density	Tourism	EQI 1997	Corruption 1997	Quality 1997	Impartiality 1997
Populist vote 2015-2019	1														
EQI 2013	-0.58	1													
Corruption 2013	-0.63	0.972	1												
Quality 2013	-0.47	0.97	0.91	1											
Impartiality 2013	-0.58	0.98	0.93	0.92	1										
Economic resistance	-0.17	0.11	0.09	0.1	0.12	1									
Young population	-0.21	0.18	0.19	0.2	0.13	0.31	1								
Tertiary education	-0.42	0.54	0.53	0.53	0.5	-0.1	-0.02	1							
Net migration	0.29	0	-0.01	0.02	0.01	0.28	-0.01	-0.13	1						
Population density	0.01	0.02	0.04	0.01	-0.01	0.04	-0.05	0.24	0.09	1					
Tourism	-0.13	-0.03	0.04	-0.04	-0.08	0.12	0.05	-0.21	-0.12	-0.33	1				
EQI 1997	-0.37	0.91	0.89	0.89	0.88	0.01	-0.03	0.44	0.09	-0.01	0.01	1			
Corruption 1997	-0.43	0.91	0.9	0.87	0.88	0.11	0.06	0.39	0.08	0.02	0	0.96	1		
Quality 1997	-0.35	0.88	0.85	0.87	0.85	-0.01	-0.1	0.49	0.08	0	-0.01	0.97	0.89	1	
Impartiality 1997	-0.21	0.81	0.79	0.81	0.76	-0.15	0	0.46	0.05	0.1	-0.09	0.91	0.85	0.85	1

A.2 First stage regressions

TABLE A.7: First regressions for EQI 2010 and EQI 2013

	Dependent variable:	
	EQI 2010	**EQI 2013**
	(1)	(2)
EQI 1997	104.789***	78.301***
	(2.528)	(2.815)
Economic resistance	0.693**	0.810***
	(0.279)	(0.298)
Young population	1.202***	1.540***
	(0.177)	(0.225)
Tertiary education	0.095*	0.325***
	(0.052)	(0.064)
Net migration	-0.110	-0.220***
	(0.091)	(0.078)
Population density	-0.0004	-0.0003
	(0.0003)	(0.0004)
Tourism	-0.081***	-0.028
	(0.017)	(0.022)
Constant	-29.968***	-35.892***
	(3.943)	(4.377)
Observations	166	156
R^2	0.945	0.907
Adjusted R^2	0.943	0.903

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.3 Different years for explanatory variables

A.3.1 2011-2016 election round

TABLE A.8: Results on 2011-2016 populist vote share, all variables at mean between 2010 and 2013

	Dependent variable: Populist vote2011-2016	
	OLS	IV
	(1)	(2)
EQI 2010-2013	-0.281***	-0.263***
	(0.037)	(0.039)
Economic resistance	-1.337***	-1.906***
	(0.351)	(0.345)
Young population	-1.416***	-1.341***
	(0.306)	(0.263)
Tertiary education	-0.228***	-0.310***
	(0.087)	(0.091)
Net migration	0.258**	0.189
	(0.117)	(0.150)
Population density	-0.001**	-0.001**
	(0.0004)	(0.0004)
Tourism	-0.055*	-0.079**
	(0.031)	(0.034)
Constant	90.079***	91.841***
	(5.768)	(6.250)
Weak instr. EQI 1997		1514.82
(p-value)		(0.000)
Wu-Hausman test		14.73
(p-value)		(0.000)
Observations	196	155
R^2	0.577	0.630
Adjusted R^2	0.562	0.613

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.3.2 2015-2019 election round

TABLE A.9: Results on 2015-2019 populist vote share, all variables at mean between 2013 and 2015 and between 2013 and 2017 for EQI

	Dependent variable: Populist vote 2015-2019	
	OLS	IV
	(1)	(2)
EQI 2013-2017	-0.341***	-0.215***
	(0.056)	(0.081)
Economic resistance	-0.586***	-0.381
	(0.192)	(0.290)
Young population	-0.499*	-0.697**
	(0.293)	(0.325)
Tertiary education	-0.376***	-0.497***
	(0.110)	(0.130)
Net migration	0.608***	0.385*
	(0.154)	(0.234)
Population density	0.00002	0.0001
	(0.0005)	(0.0005)
Tourism	-0.071**	-0.103***
	(0.033)	(0.037)
Constant	76.682***	79.250***
	(5.696)	(6.107)
Weak instr. EQI 1997		511.01
(p-value)		(0.000)
Wu-Hausman test		36.07
(p-value)		(0.000)
Observations	197	156
R^2	0.520	0.435
Adjusted R^2	0.502	0.408

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.4 Reduced number of observations

A.4.1 2011-2016 election round

TABLE A.10: Resuts on Populist vote 2011-2016 with reduced number of observations

	Dependent variable: Populist vote 2011-2016	
	OLS	IV
	(1)	(2)
EQI 2010	-0.270***	-0.227***
	(0.037)	(0.037)
Economic resistance	-1.785***	-1.876***
	(0.393)	(0.396)
Young population	-1.496***	-1.475***
	(0.304)	(0.313)
Tertiary education	-0.262***	-0.317***
	(0.089)	(0.087)
Net migration	0.089	0.062
	(0.139)	(0.140)
Population density	-0.001	-0.001
	(0.001)	(0.001)
Tourism	-0.064*	-0.064*
	(0.038)	(0.036)
Constant	94.741***	93.043***
	(7.674)	(7.740)
Weak instr. EQI 1997		1794.59
(p-value)		(0.000)
Wu-Hausman test		20.47
(p-value)		(0.000)
Observations	166	166
R^2	0.559	0.555
Adjusted R^2	0.540	0.535

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.4.2 2015-2019 election round

TABLE A.11: Resuts on Populist vote 2015-2019 with reduced number of observations

	Dependent variable: Populist vote 2015-2019	
	OLS	IV
	(1)	(2)
EQI 2013	-0.323***	-0.222***
	(0.059)	(0.062)
Economic resistance	-1.357***	-1.459***
	(0.386)	(0.396)
Young population	-0.422	-0.551**
	(0.257)	(0.264)
Tertiary education	-0.277***	-0.400***
	(0.098)	(0.108)
Net migration	0.655***	0.634***
	(0.140)	(0.150)
Population density	-0.0001	0.0001
	(0.001)	(0.001)
Tourism	-0.074**	-0.078***
	(0.030)	(0.030)
Constant	72.246***	72.757***
	(5.256)	(5.242)
Weak instr. QoG 1997		880.93
(p-value)		(0.000)
Wu-Hausman test		25.57
(p-value)		(0.000)
Observations	156	156
R2	0.491	0.478
Adjusted R2	0.467	0.454

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.5 Alternative outcome variables

A.5.1 Populist-authoritarian vote share

TABLE A.12: Results on populist-authoritarian vote share

	Dependent variable: Populist-authoritarian vote2011-2016		Dependent variable: Populist-authoritarian vote2015-2019	
	OLS	IV	OLS	IV
	(1)	(2)	(1)	(2)
EQI2010	-0.153***	-0.134***		
	(0.027)	(0.029)		
EQI2013			-0.139***	-0.033
			(0.048)	(0.045)
Economic resistance	-0.745*	-0.873**	0.098	0.510
	(0.400)	(0.388)	(0.321)	(0.394)
Young population	-0.820***	-1.036***	-0.615**	-0.918***
	(0.257)	(0.279)	(0.258)	(0.294)
Tertiary education	-0.235***	-0.323***	-0.447***	-0.561***
	(0.067)	(0.070)	(0.090)	(0.109)
Net migration	-0.071	-0.106	0.256***	0.258*
	(0.163)	(0.149)	(0.096)	(0.154)
Population density	0.0001	0.0001	0.0003	0.0003
	(0.001)	(0.001)	(0.0003)	(0.0004)
Tourism	-0.023	-0.050*	-0.060**	-0.081**
	(0.025)	(0.029)	(0.028)	(0.033)
Constant	75.594***	82.483***	73.272***	76.964***
	(5.147)	(7.059)	(5.094)	(6.254)
Weak instr. EQI 1997		1794.59		880.93
(p-value)		(0.000)		(0.000)
Wu-Hausman test		12.94		25.54
(p-value)		(0.000)		(0.000)
Observations	208	166	197	156
R^2	0.343	0.387	0.320	0.270
Adjusted R^2	0.320	0.360	0.295	0.236

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.5.2 Authoritarian vote share

TABLE A.13: Results on Authoritarian vote share

	Dependent variable: Authoritarian vote2011-2016		**Dependent variable: Authoritarian vote2015-2019**	
	OLS	IV	OLS	IV
	(1)	(2)	(1)	(2)
EQI2010	-0.052	-0.041		
	(0.036)	(0.047)		
EQI2013			-0.002	0.156***
			(0.052)	(0.049)
Economic resistance	0.001	0.128	1.600***	2.478***
	(0.515)	(0.523)	(0.400)	(0.473)
Young population	-0.165	-0.597*	-0.601**	-1.283***
	(0.283)	(0.349)	(0.303)	(0.371)
Tertiary education	-0.222**	-0.329***	-0.512***	-0.722***
	(0.088)	(0.095)	(0.104)	(0.137)
Net migration	-0.312*	-0.274	-0.039	-0.118
	(0.181)	(0.200)	(0.095)	(0.173)
Population density	0.001	0.001	0.0004	0.0005
	(0.001)	(0.001)	(0.001)	(0.001)
Tourism	0.001	-0.035	-0.048	-0.084*
	(0.028)	(0.032)	(0.032)	(0.043)
Constant	59.619***	71.939***	70.306***	81.160***
	(5.960)	(8.711)	(6.413)	(8.572)
Weak instr. EQI 1997		1794.59		880.93
(p-value)		(0.000)		(0.000)
Wu-Hausman test		3.48		18.89
(p-value)		(0.064)		(0.000)
Observations	208	166	197	156
R^2	0.097	0.127	0.173	0.201
Adjusted R^2	0.065	0.088	0.142	0.163

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

A.5.3 Alternative definition of populist vote share

TABLE A.14: Results on alternative populist vote share

	Dependent variable: Populist vote2011-2016		**Dependent variable: Populist vote2015-2019**	
	OLS	IV	OLS	IV
	(1)	(2)	(1)	(2)
EQI2010	-0.200***	-0.111***		
	(0.040)	(0.033)		
EQI2013			-0.174**	-0.122**
			(0.077)	(0.058)
Economic resistance	-0.991**	-1.729***	-4.575***	-3.972***
	(0.495)	(0.428)	(0.575)	(0.511)
Young population	-1.852***	-1.018***	0.376	1.167***
	(0.321)	(0.349)	(0.418)	(0.295)
Tertiary education	0.022	0.057	-0.152	0.048
	(0.105)	(0.100)	(0.159)	(0.123)
Net migration	0.141	0.158	1.196***	1.496***
	(0.180)	(0.156)	(0.244)	(0.178)
Population density	-0.002***	-0.001**	-0.00001	-0.0001
	(0.001)	(0.0004)	(0.001)	(0.001)
Tourism	-0.012	0.065**	0.012	0.061*
	(0.037)	(0.029)	(0.048)	(0.035)
Constant	60.246***	31.479***	17.388*	-8.935
	(7.317)	(7.848)	(9.335)	(6.246)
Weak instr. EQI 1997		1794.59		880.93
(p-value)		(0.000)		(0.000)
Wu-Hausman test		3.22		9.29
(p-value)		(0.075)		(0.003)
Observations	208	166	197	156
R^2	0.272	0.177	0.447	0.483
Adjusted R^2	0.246	0.141	0.426	0.458

Note: *p<0.1; >**p<0.05; >***p<0.01. Standard errors are clustered at country level

B Appendix to Chapter 3

B.1 Variation inflation factors

TABLE B.1: Variation inflation factors (VIFS)

Variation inflation factors (VIFS)						
Corruption 2010	Economic resistance	Young population	Tertiary education	Net migration	Population density	Tourism
1.42	1.23	1.09	1.55	1.36	1.30	1.23

B.2 Results on the Corruption pillar

TABLE B.2: Results of GWR on the corruption pillar

Summary of GWR coefficient estimates					
	Min.	1st	Qu.	Median	3rd
Intercept	0.212614	0.677757	0.951034	1.342557	1.8101
Corruption2010	-0.02962	-0.0234	-0.01739	-0.01164	0.0031
Economic_Recovery	-0.24657	-0.17299	-0.14214	-0.11133	-0.065
Young_population	-0.54379	-0.38502	-0.24718	-0.13231	0.0113
Tertiary_education	-0.56524	-0.39841	-0.24578	-0.10091	0.1342
Net_migration	-0.22625	-0.01858	0.041391	0.092823	0.2534
Population_density	-0.14936	-0.11225	-0.03302	0.086146	0.2743
Tourism	-0.51988	-0.30707	-0.16746	-0.0137	0.15
Diagnostic information					
Number of data points: 207					
Effective number of parameters (2trace(S) - trace(S'S)): 50.83862					
Effective degrees of freedom (n-2trace(S) + trace(S'S)): 156.1614					
AICc (GWR book, Fotheringham, et al. 2002, p. 61, eq 2.33): 379.9932					
AIC (GWR book, Fotheringham, et al. 2002,GWR p. 96, eq. 4.22): 320.4585					
Residual sum of squares: 47.34127					
R-square value: 0.770188					
Adjusted R-square value: 0.6948901					

TABLE B.3: Results of MGWR on the corruption pillar

Summary of GWR with Parameter-Specific Distance Metrics					
	Min.	1st	Qu.	Median	3rd
Intercept	0.61187	0.737664	0.836498	0.948556	1.1723
Corruption2010	-0.01873	-0.01767	-0.01659	-0.01457	-0.0123
Economic_Recovery	-0.09027	-0.08619	-0.07932	-0.07023	-0.0607
Young_population	-0.60473	-0.38448	-0.23884	-0.13941	-0.0491
Tertiary_education	-0.34962	-0.24625	-0.13952	-0.02523	0.256
Net_migration	-0.42355	-0.12406	-0.04218	0.04498	0.2683
Population_density	-0.10069	-0.10008	-0.0992	-0.09866	-0.0982
Tourism	-0.38239	-0.27721	-0.17078	-0.03782	0.179
Diagnostic information					
Residual sum of squares: 39.24037					
R-square value: 0.8095128					
Adjusted R-square value: 0.7405158					
AICc value: 357.0059					

B.3 Results on the Quality pillar

TABLE B.4: Results of the GWR on the quality pillar

Summary of GWR coefficient estimates					
	Min.	1st Qu.	Median	3rd Qu.	Max.
Intercept	-1.55832	0.562531	0.769241	1.259386	2.2467
Quality2010	-0.0341	-0.01999	-0.01176	-0.00565	0.0122
Economic_Resistance	-0.3009	-0.19489	-0.16431	-0.12873	-0.0703
Young_population	-0.53662	-0.37117	-0.20133	-0.13357	0.0939
Tertiary_education	-0.54132	-0.40958	-0.26017	-0.12947	0.1313
Net_migration	-0.21448	-0.02854	0.03094	0.118174	0.2799
Population_density	-0.15353	-0.10314	-0.01938	0.083238	0.2804
Tourism	-0.53013	-0.28983	-0.15985	-0.0038	0.1748
Diagnostic information					
Number of data points: 207					
Effective number of parameters (2trace(S) - trace(S'S)): 51.36962					
Effective degrees of freedom (n-2trace(S) + trace(S'S)): 155.6304					
AICc (GWR book, Fotheringham, et al. 2002, p. 61, eq 2.33): 396.5994					
AIC (GWR book, Fotheringham, et al. 2002,GWR p. 96, eq. 4.22): 336.3976					
Residual sum of squares: 51.05141					
R-square value: 0.75217					
Adjusted R-square value: 0.66984					

TABLE B.5: Results of the MGWR on the quality pillar

GWR with Parameter-Specific Distance Metrics					
Summary of GWR coefficient estimates					
	Min.	1st Qu.	Median	3rdQu.	Max.
Intercept	0.003858	0.215152	0.354253	0.545088	0.7668
Quality2010	-0.01307	-0.00879	-0.00689	-0.00544	-0.003
Economic_Resistance	-0.1335	-0.11812	-0.11179	-0.09176	-0.0667
Young_population	-0.62844	-0.35431	-0.22961	-0.13351	-0.0398
Tertiary_education	-0.35673	-0.23993	-0.12771	-0.04085	0.2466
Net_migration	-0.45408	-0.14401	-0.07684	0.059049	0.2895
Population_density	-0.10093	-0.10028	-0.09921	-0.09862	-0.0981
Tourism	-0.36935	-0.25944	-0.16892	-0.07134	0.1726
Diagnostic information					
Residual sum of squares:	39.33409				
R-square value:	0.8090578				
Adjusted R-square value:	0.7336875				
AICc value:	363.0141				

B.4 Results on the Impartiality pillar

TABLE B.6: Results of the GWR on the impartiality pillar

Summary of GWR coefficient estimates					
	Min.	1st Qu.	Median	3rdQu.	Max.
Intercept	-1.73947	0.309984	0.869239	1.16835	1.6382
Impartiality2010	-0.02832	-0.01788	-0.0125	-0.00553	0.0149
Economic_Resistance	-0.24848	-0.15762	-0.12133	-0.08165	-0.0088
Young_population	-0.51658	-0.38653	-0.23017	-0.1703	0.1752
Tertiary_education	-0.55561	-0.40892	-0.24202	-0.15538	0.1144
Net_migration	-0.21805	-0.04994	0.009574	0.076558	0.2969
Population_density	-0.13728	-0.08663	-0.02614	0.079961	0.3039
Tourism	-0.54395	-0.31955	-0.18167	-0.01913	0.1447
Diagnostic information					
Number of data points: 207					
Effective number of parameters (2trace(S) - trace(S'S)): 50.98573					
Effective degrees of freedom (n-2trace(S) + trace(S'S)): 156.0143					
AICc (GWR book, Fotheringham, et al. 2002, p. 61, eq 2.33): 387.1762					
AIC (GWR book, Fotheringham, et al. 2002,GWR p. 96, eq. 4.22): 327.4516					
Residual sum of squares: 48.9463					
R-square value: 0.76239					
Adjusted R-square value: 0.6842					

TABLE B.7: Results of the MGWR on the impartiality pillar

GWR with Parameter-Specific Distance Metrics					
Summary of GWR coefficient estimates					
	Min.	1st Qu.	Median	3rdQu.	Max.
Intercept	-0.75406	-0.42895	-0.19502	0.302892	0.5105
Impartiality2010	-0.00642	-0.00257	-0.00076	0.00072	0.0036
Economic_Resistance	-0.0874	-0.08197	-0.07751	-0.07201	-0.0643
Young_population	-0.60738	-0.34336	-0.24141	-0.16608	-0.0309
Tertiary_education	-0.44756	-0.3165	-0.20101	-0.08749	0.2195
Net_migration	-0.44928	-0.16369	-0.08202	0.060484	0.306
Population_density	-0.08697	-0.08633	-0.08561	-0.08503	-0.0845
Tourism	-0.38135	-0.27379	-0.18142	-0.07828	0.1413
Diagnostic information					
Residual sum of squares:	41.27814				
R-square value:	0.799621				
Adjusted R-square value:	0.725612				
AICc value:	366.3049				

C Appendix to Chapter 4

C.1 Variable details

TABLE C.1: Party scores and classifications

Authoritarian and populist scores by party - Classification by Norris and Inglehart (2019)			
Party name (Italian denomination)	**Authoritarian score**	**Party name (Italian denomination)**	**Populist score**
Communist Refoundation Party (Partito della Rifondazione Communista)	19	Union of the Centre (Unione di Centro)	34
Left Ecology Freedom (Sinistra Ecologia Libertá)	20	New Centre-Right (Nuovo Centrodestra)	37
Democratic Party (Partito Democratico)	37	Come on Italy (Forza Italia)	37
Five Star Movement (Movimento Cinque Stelle)	39	Civic Choice (Scelta Civica)	41
Aosta Valley (Vallée d'Aoste)	47	Aosta Valley (Vallée d'Aoste)	46
Civic Choice (Scelta Civica)	55	South Tyrolean People's Party (Südtiroler Volkspartei)	49
Democratic Centre (Centro Democratico-Diritti e Libertá)	57	Democratic Centre (Centro Democratico-Diritti e Libertá)	50
South Tyrolean People's Party (Südtiroler Volkspartei)	60	Democratic Party (Partito Democratico)	58
Union of the Centre (Unione di Centro)	70	Brothers of Italy (Fratelli d'Italia)	62
New Centre-Right (Nuovo Centrodestra)	74	Left Ecology Freedom (Sinistra Ecologia Libertá)	71
Come on Italy (Forza Italia)	76	(Northern) League (Lega (Nord))	78
(Northern) League (Lega (Nord))	86	Communist Refoundation Party (Partito della Rifondazione Comunista)	92
Brothers of Italy (Fratelli d'Italia)	91	Five Star Movement (Movimento Cinque Stelle)	100
Far-right populist parties – Classification by Rooduijn et al. (2019)			
Brothers of Italy (Fratelli d'Italia)	(Northern) League (Lega (Nord))	Southern Action League (Lega d'Azione Meridionale)	

TABLE C.2: Definition of the variables included in the analysis

Variable name	Definition	Time period	Source
Average building age	Average age of building construction	2001, 2011	Italian National Statistics Institute (ISTAT)
Electoral turnout	Percentage of voters over the electorate	2004, 2006, 2008, 2009, 2013, 2014, 2018, 2019	Italian Ministry of the Interior
Income per capita (euro, constant 2010 values)	Deflated income per capita	2003, 2005, 2007, 2008, 2012, 2013, 2017, 2018	Italian National Statistics Institute (ISTAT)
Intensity of the Emilian earthquake	Seismic intensity, Modified Mercalli Intensity (MMI) scale	2012	National Institute of Geophysics and Vulcanology (INGV)
Intensity of L'Aquila earthquake	Seismic intensity, Modified Mercalli Intensity (MMI) scale	2009	National Institute of Geophysics and Vulcanology (INGV)
N. of employees (log)	Total number of employees	2001, 2006, 2007, 2008, 2012, 2013, 2016, 2017	Statistical Register of Active Enterprises archive (ASIA), ISTAT
Population (log)	Population size	2003, 2005, 2007, 2008, 2012, 2013, 2017, 2018	Italian National Statistics Institute (ISTAT)
Population density	Total population over surface (kmq)	2003, 2005, 2007, 2008, 2012, 2013, 2017, 2018	Italian National Statistics Institute (ISTAT)
Seismic risk classification	Seismic risk, classes from 1 to 4	2003	O.P.C.M. 3274 (2003)
Share of authoritarian vote	Share of vote multiplied by the authoritarian score	2004, 2006, 2008, 2009, 2013, 2014, 2018, 2019	Italian Ministry of the Interior & Norris and Inglehart (2019)
Share of authoritarian-populist vote (employed for sensitivity only)	Share of votes as a weighted average of authoritarian and populist scores	2004, 2006, 2008, 2009, 2013, 2014, 2018, 2019	Italian Ministry of the Interior & Norris and Inglehart (2019)
Share of net migration	Difference between n. of residents and n. people unregistered; growth rate with respect to 2002	2003, 2005, 2007, 2008, 2012, 2013, 2017, 2018	Italian National Statistics Institute (ISTAT)
Share of elderly population (over 65)	Percentage of over-65 aged people over the total population	2003, 2005, 2007, 2008, 2012, 2013, 2017, 2018	Italian National Statistics Institute (ISTAT)
Share of populist vote (employed for sensitivity only)	Share of vote multiplied by populist score	2004, 2006, 2008, 2009, 2013, 2014, 2018, 2019	Italian Ministry of the Interior & Norris and Inglehart (2019)
Share of young population (18-24)	Percentage of 18-24 aged people over the total population	2003, 2005, 2007, 2008, 2012, 2013, 2017, 2018	Italian National Statistics Institute (ISTAT)
Share of secondary education	Percentage of graduates over 15-64 aged population	2001, 2011	Italian National Statistics Institute (ISTAT)
Workforce rate	Percentage of employees over 15-64 aged population	2001, 2006, 2007, 2008, 2012, 2013, 2016, 2017	Statistical Register of Active Enterprises archive (ASIA), ISTAT

C.2 Additional analyses and robustness checks

C.2.1 Central Italy 2016-2017

The Central Italy earthquakes were a series of four main seismic events, three of which took place on 24th August, 26th October, and 30th October 2016, with a moment magnitude, respectively, of 6.18 Mw, 6.07 Mw, and 6.61 Mw; and on 18th January 2017, with a magnitude of 5.70 Mw. Jointly, this seismic sequence affected 135 municipalities belonging to four adjacent regions: Marche, Umbria, Abruzzi, and Lazio. In total, 299 people were killed by the shocks. Among the most devastated municipalities were Accumoli, Pescara del Tronto, Arquata del Tronto and Amatrice. In Amatrice, 238 people died out of a total population of about 2500 people (Massazza et al., 2019).

The sample built for this analysis excludes the same set of municipalities excluded for L'Aquila. We limit the dataset by removing the municipalities previously hit by the other disaster events, and for a more refined matched set, we also exclude Rome from the analysis. We set $L = 3$ and $F = 1$. Figure C.3 shows the balancing of the covariates, stable across the three pre-treatment electoral rounds and fully within the $(-1, 1)$ range of the standard deviation. The level of imbalance for the lagged values of the share of authoritarian vote stays relatively constant over the entire pre-treatment period.

Table C.3 shows the overall results for the impact of the Central Italy earthquakes on the authoritarian vote share. There is a positive and strongly significant effect on right-wing populist voting at time t (2018 national elections) and a positive but insignificant effect at $t + 1$ (2019 European elections). Note, however, that there was an unprecedented boom of votes for the League party in these areas (especially the most affected ones like Amatrice, Accumoli, Arquata del Tronto) at the 2019 European elections, a fact which featured heavily in media reports.[1]

In the same spirit of the main analysis, we disaggregate by intensity levels. As shown in Table C.4, only when looking at severely affected municipalities do the voting effects appear.

[1] See, for example, here:
https://www.iltempo.it/politica/2019/05/28/news/comuni-cratere-terremoto-lega-elezioni\-europee-boom-salvini-amatrice-arquata-tronto-visso-umbria-marche-lazio-abruzzo-1162267/
and here:
https://www.repubblica.it/dossier/politica/elezioni-europee-2019-ue-23-26-maggio/2019/05/28/news/lega_comuni_cratere_centro_italia_amatrice_sindaco_fontanella-227429261/ (both sources in Italian).

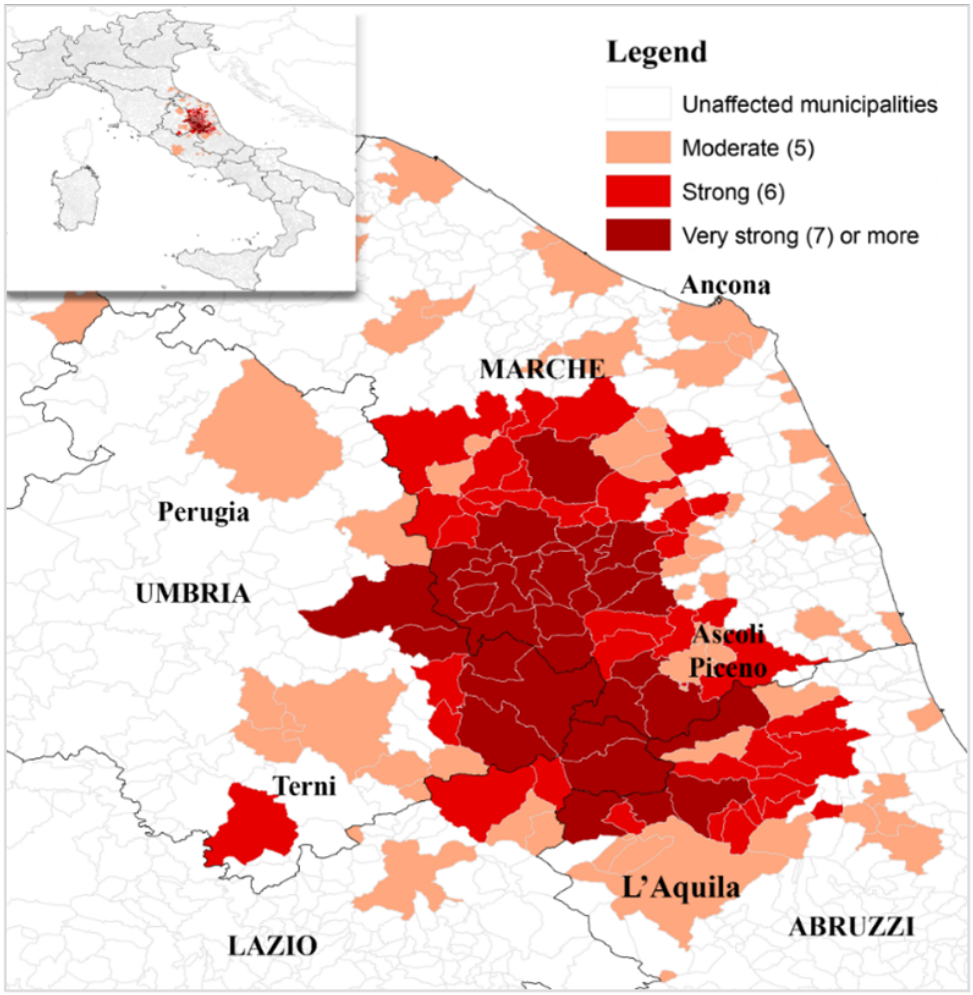


FIGURE C.1: Central Italy 2016-2017 earthquakes – Seismic intensity (MMI scale)

Notes: The map shows the maximum seismic intensity registered by each municipality. 68 municipalities were hit by a 'moderate' shaking, 38 municipalities were hit by a 'strong' shaking, and 33 municipalities were hit by a 'very strong' or higher shaking. The highest intensity (11) was experienced in the municipalities of Arquata del Tronto and Amatrice.

TABLE C.3: Impact of Central Italy 2016-2017 on the right-wing populist vote share (%)

Intensity >5 (71 municipalities)		
Treatment period	**t (2018)**	**t+1 (2019)**
Point estimates	1.97***	1.44
Block-bootstrapped SE	(0.43)	(1.27)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

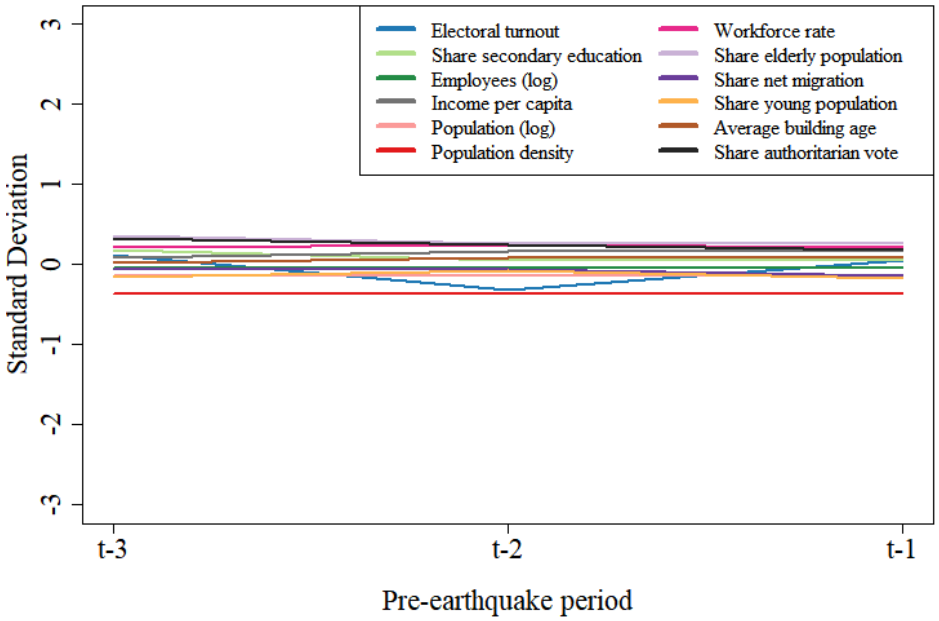


FIGURE C.3: Covariate balancing for Central Italy 2016 – 2017

TABLE C.4: Impact of Central Italy 2016-2017 on the right-wing populist vote share (%) – By intensity levels

Intensity >5 and Intensity 6 (38 municipalities)		
Treatment period	**t (2018)**	**t+1 (2019)**
Point estimates	0.34	0.80
Block-bootstrapped SE	(0.80)	(1.72)
Intensity >6 (33 municipalities)		
Treatment period	**t (2018)**	**t+1 (2019)**
Point estimates	2.17***	2.17
Block-bootstrapped SE	(0.60)	(1.70)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.2.2 Removal of municipalities hit by Central Italy 2016-2017 earthquakes

TABLE C.5: Impact of L'Aquila 2009 on the right-wing populist vote share (%) – Without municipalities hit by Central Italy 2016-2017

Intensity >5 (75 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.78***	1.02	1.28	2.84***	4.13***
Block-bootstrapped SE	(0.70)	(0.70)	(0.79)	(0.76)	(1.28)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.2.3 Placebo tests

- Only municipalities with intensity equal to 5 ("moderate")

TABLE C.6: Impact on the right-wing populist vote share (%) – Intensity = 5

L'Aquila 2009 - Intensity = 5 (47 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	1.02**	-0.65	-0.71	0.45	1.12
Block-bootstrapped SE	(0.51)	(0.56)	(0.64)	(0.56)	(1.51)
Emilia 2012 - Intensity = 5 (13 municipalities)					
Treatment period		t (2013)	t+1 (2014)	t+2 (2018)	t+3 (2019)
Point estimates		-0.04	-0.03	-0.21	-0.18
Block-bootstrapped SE		(1.28)	(1.06)	(0.43)	(2.40)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively

- Random re-assignment of the treatment

TABLE C.7: In-space placebo test for the impact of L'Aquila 2009 on the right-wing populist vote share (%)

Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	0.05	-0.20	0.05	0.40	0.45
Block-bootstrapped SE	(0.65)	(0.59)	(0.53)	(0.50)	(0.96)
Intensity >5 and Intensity 6 (69 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	0.15	-0.31	0.02	0.28	0.76
Block-bootstrapped SE	(0.49)	(0.66)	(0.60)	(0.53)	(1.08)
Intensity >6 (20 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	-0.29	0.18	0.15	0.78	-0.62
Block-bootstrapped SE	(2.52)	(1.44)	(1.34)	(1.36)	(2.23)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

TABLE C.8: In-space placebo test for the impact of Emilia 2012 on the right-wing populist vote share (%)

Intensity >5 (30 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	0.36	0.07	0.09	-0.35
Block-bootstrapped SE	(1.11)	(0.94)	(0.50)	(1.11)
Intensity >5 and Intensity 6 (10 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	0.94	0.21	0.70	0.30
Block-bootstrapped SE	(2.65)	(2.12)	(0.78)	(2.24)
Intensity >6 (20 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	0.07	0.00	-0.21	-0.67
Block-bootstrapped SE	(1.34)	(1.13)	(0.67)	(1.48)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.2.4 Alternative neighbour numbers

- Size equal to 3

TABLE C.9: Impact on the right-wing populist vote share (%) – Size match = 3

L'Aquila 2009 - Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.75***	1.62**	1.71**	3.07***	4.05***
Block-bootstrapped SE	(0.61)	(0.64)	(0.72)	(0.71)	(1.30)
Emilia 2012 - Intensity >5 (30 municipalities)					
Treatment period		**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		-0.58	-0.54	-0.34	0.01
Block-bootstrapped SE		(0.79)	(0.71)	(0.29)	(1.40)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

- Size equal to 10

TABLE C.10: Impact the right-wing populist vote share (%) – Size match = 10

L'Aquila 2009 - Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.97***	1.62***	1.70***	3.46***	4.27***
Block-bootstrapped SE	(0.59)	(0.57)	(0.64)	(0.63)	(1.18)
Emilia 2012 - Intensity >5 (30 municipalities)					
Treatment period		**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		-0.53	-0.61	-0.18	0.18
Block-bootstrapped SE		(0.78)	(0.67)	(0.30)	(1.30)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.2.5 Alternative matching methods

TABLE C.11: Impact of L'Aquila 2009 on the right-wing populist vote share (%) – Propensity score matching

Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	3.61***	0.75	0.89	1.89**	2.99**
Block-bootstrapped SE	(0.75)	(0.74)	(0.89)	(0.89)	(1.48)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

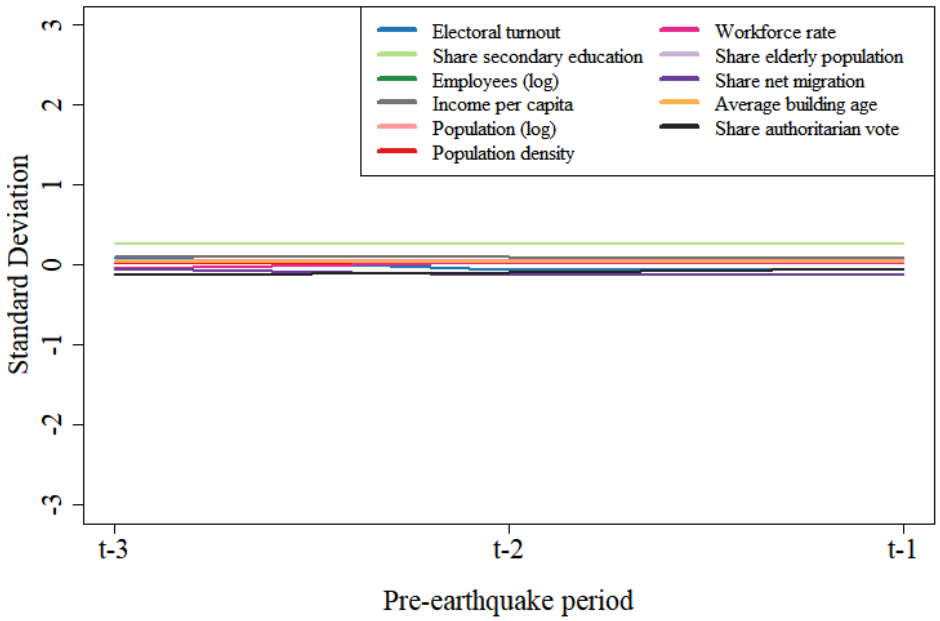


FIGURE C.4: Covariate balancing for L'Aquila 2009 – Propensity score matching

TABLE C.12: Impact of Emilia 2012 on the right-wing populist vote share (%) – Propensity score matching

Intensity >5 (30 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.30	-0.48	-0.19	0.26
Block-bootstrapped SE	(0.82)	(0.68)	(0.35)	(1.31)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

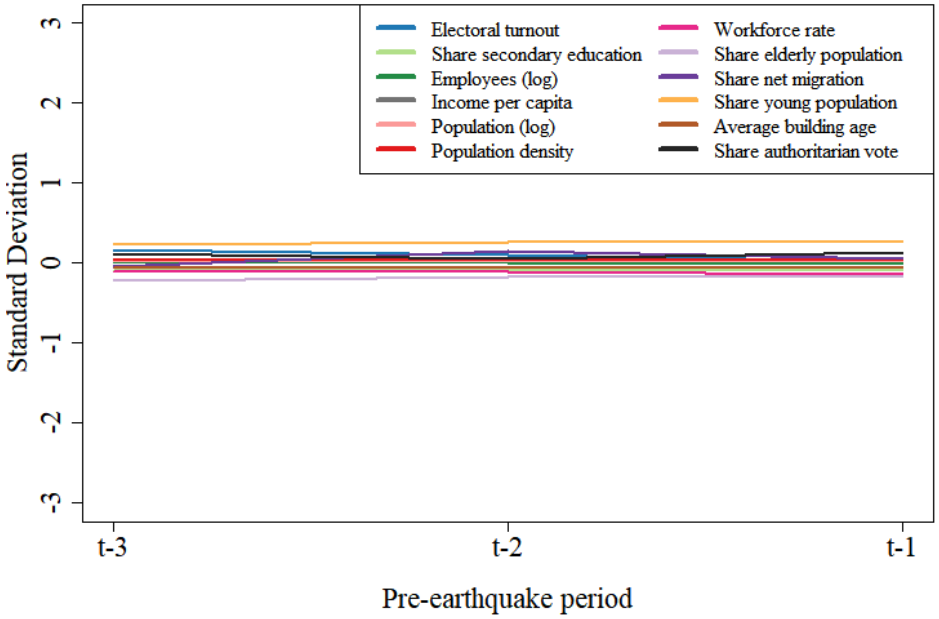


FIGURE C.5: Covariate balancing for Emilia 2012 – Propensity score matching

C.2.6 Removal of distant regions from each sample

TABLE C.13

Impact of L'Aquila 2009 on the right-wing populist vote share (%) – Close regions only (Umbria, Marche, Abruzzi, Lazio, Molise, Campania)

Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.46***	0.42	0.87	2.49***	3.33**
Block-bootstrapped SE	(0.59)	(0.67)	(0.74)	(0.73)	(1.30)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

TABLE C.14

Impact of Emilia 2012 on the right-wing populist vote share (%) – Close regions only (Veneto, Lombardy, Emilia-Romagna)

Intensity >5 (30 municipalities)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.37	-0.46	-0.13	0.20
Block-bootstrapped SE	(0.79)	(0.68)	(0.30)	(1.28)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.2.7 Alternative outcome variables

- Composite score (both authoritarian and populist components) of Norris and Inglehart (2019)

TABLE C.15: Impact on the populist-authoritarian vote share (%)

L'Aquila 2009 - Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	3.02***	1.08	1.58	1.26	2.41
Block-bootstrapped SE	(0.43)	(1.11)	(1.39)	(1.65)	(2.03)
Emilia 2012 - Intensity >5 (30 municipalities)					
Treatment period		**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		-0.87	-0.62	-0.21	0.06
Block-bootstrapped SE		(0.93)	(1.19)	(1.68)	(2.16)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

- Only populist component of Norris and Inglehart (2019) score

TABLE C.16: Impact on the populist vote share (%)

L'Aquila 2009 - Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	1.30***	0.31	1.43	-0.92	0.21
Block-bootstrapped SE	(0.41)	(2.01)	(2.34)	(2.93)	(2.92)
Emilia 2012 - Intensity >5 (30 municipalities)					
Treatment period		**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		-1.16	-0.62	-0.14	0.25
Block-bootstrapped SE		(2.37)	(2.81)	(3.07)	(2.81)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.3 Mechanisms

C.3.1 Pre-existing territorial disparities

TABLE C.17: Impact of L'Aquila 2009 on the right-wing populist vote share (%) – By median of average income growth (2000-2008)

Intensity >5 (Below the median)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	5.95***	1.19	1.46*	2.44***	3.90**
Block-bootstrapped SE	(0.85)	(0.83)	(0.91)	(0.93)	(1.54)
Intensity >5 (Above the median)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	3.18***	1.96**	1.45	4.41***	4.82**
Block-bootstrapped SE	(0.74)	(0.92)	(1.01)	(0.92)	(1.91)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

TABLE C.18: Impact of Emilia 2012 on the right-wing populist vote share (%) – By median of average income growth (2000-2008)

Intensity >5 (Below the median)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.48	-0.39	-0.22	0.12
Block-bootstrapped SE	(0.89)	(0.79)	(0.32)	(1.41)
Intensity >5 (Above the median)				
Treatment period	**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates	-0.74	-1.03	0.38	0.92
Block-bootstrapped SE	(2.36)	(1.97)	(0.92)	(4.46)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.3.2 Filtering out the "promise" effect

TABLE C.19: Impact of the earthquakes on the far-right populist vote share (%) – Classification by Rooduijn et al. (2019)

L'Aquila 2009 - Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	-0.05	0.00	0.26	5.78***	5.11
Block-bootstrapped SE	(0.13)	(0.05)	(0.77)	(1.67)	(3.23)
Emilia 2012 - Intensity >5 (30 municipalities)					
Treatment period		**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		0.04	-0.25	-0.98	0.87
Block-bootstrapped SE		(1.94)	(0.98)	(2.42)	(4.76)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

TABLE C.20: Impact of the earthquakes on "People of Freedom/Come on Italy" vote share (%)

L'Aquila 2009 - Intensity >5 (89 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	8.51***	2.12	1.26	0.98	-1.10
Block-bootstrapped SE	(0.95)	(1.61)	(1.84)	(2.32)	(2.76)
Emilia 2012 - Intensity >5 (30 municipalities)					
Treatment period		**t (2013)**	**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		0.01	-0.88	0.16	-0.32
Block-bootstrapped SE		(1.77)	(2.45)	(2.85)	(3.71)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.3.3 Different seismic intensities

TABLE C.21: Impact of L'Aquila earthquake on the right-wing populist vote share (%) – Intensity <= 8

5 <Intensity <= 8 (84 municipalities)					
Treatment period	**t (2009)**	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	4.67***	1.31**	1.23*	3.20***	4.14***
Block-bootstrapped SE	(0.63)	(0.64)	(0.69)	(0.67)	(1.22)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

C.3.4 Economic impacts

- Employment

TABLE C.22: Impact of the earthquakes on employment (log)

L'Aquila 2009 - Intensity >5 (89 municipalities)				
Treatment period	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	0.05*	0.02	-0.04	-0.05
Block-bootstrapped SE	(0.03)	(0.03)	(0.04)	(0.04)
Emilia 2012 - Intensity >5 (30 municipalities)				
Treatment period		**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		-0.01	0.01	0.00
Block-bootstrapped SE		(0.03)	(0.03)	(0.03)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

- Income

TABLE C.23: Impact of the earthquakes on annual real income per capita (in 2010 Euro values)

L'Aquila 2009 - Intensity >5 (89 municipalities)				
Treatment period	**t+1 (2013)**	**t+2 (2014)**	**t+3 (2018)**	**t+4 (2019)**
Point estimates	390.42***	366.42***	614.11***	585.44***
Block-bootstrapped SE	(81.07)	(77.89)	(106.48)	(97.44)
Emilia 2012 - Intensity >5 (30 municipalities)				
Treatment period		**t+1 (2014)**	**t+2 (2018)**	**t+3 (2019)**
Point estimates		90.16	223.30**	235.34*
Block-bootstrapped SE		(126.04)	(99.74)	(143.73)

Notes: ***, **, * denote significance at the 1, 5, and 10% level, respectively.

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