The Czech Pirate Party in the 2010 and 2013 Parliamentary Elections and the 2014 European Parliament Elections: Spatial Analysis of Voter Support[1]

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Abstract

The paper presents a spatial analysis of the Czech Pirate Party (Pirates) voter support in the 2010 and 2013 parliamentary elections and the 2014 European Parliament elections. The main method applied for classifying electoral results was the spatial autocorrelation and spatial regression. The result of the analysis has shown that territorial support for the Pirates copies to a great extent the areas of high support for right-wing parties and simultaneously the areas exemplified by a high development potential. In the case of spatial characteristics, little support for the Pirates was shown in Moravia and higher in the Sudetenland in terms of determinants of support. Additionally to spatial regimes, inter-regional support for the Pirates was also influenced by other non-spatial characteristics, although the strength of their influence was relatively weak. The units which embodied a successful environment for voting for the Pirates were particularly characterized by greater urbanization and a greater number of entrepreneurs, while a lack of jobs and the older age structure, i.e. the signs that in the socio-economic, or socio-ecological sense define peripheral areas, negatively impacted the gains of the Pirates. Ambiguous influence was exercised by college-educated inhabitants, who in the parliamentary elections in 2010 and 2013 decreased the gains of the Pirates, however, in the elections to the European Parliament in 2014 a direction of relationship was modified and turned positive.

Key words: Czech Republic; Czech Pirate Party; elections; electoral geography; spatial analysis; spatial autocorrelation; spatial regression

INTRODUCTION

Evolution of party-political systems in the area of Western Europe in the last twenty years has been characterized by a strong rise in new parties (Lucardie, 2000; Emanuele and Chiaramonte, 2016), and thus partially resembles the situation, which was typical for democratizing countries of Central and Eastern

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Europe after 1990 (Sikk, 2005; Tavits, 2008; Powell and Tucker, 2014). One of the new political waves that sought to take advantage of the increased willingness of voters to vote for a new party, were the pirate parties. According to Charvát (2015, p. 29-30), the location of the pirate parties on the left-right scale has aroused questions from the beginning because, for example, Swedish pirates were de facto a mono-thematic party (single-issue party) directed into the Internet space and related areas. Despite a certain degree of precision of a program of the pirate parties in the ensuing period, their placement in the left-right axis remains quite complicated. In this case Charvát (2015, p. 37) talks about profiling of the pirates towards social-liberal ideology (with occasional detours to left-wing libertarianism) and, similarly, Brunclík (2010) ranks the pirate parties among the party group of left-libertarian parties, with regard to their rejection of public authority of the state combined with the refusal of the market and embracement of egalitarianism (Brunclík, 2010, p. 23).

Furthermore, even though the first Pirate Party – a Swedish Pirate Party (Piratpartiet) – was established more than ten years ago (1 December, 2006), the research of the pirate parties still remains a relatively undeveloped discipline, largely due to their relatively small success, de facto only limited to the success of Swedish pirates in the elections to the European Parliament (EP) in 2009 and the success of Icelandic pirates in the parliamentary elections in 2013 and 2016.[3] Yet, there already exist several studies that have attempted to map the reasons for the emergence, form, or electoral base of pirate parties (see e.g. Miegel and Olsson, 2008; Cosstick, 2009; Brunclík, 2010; Hartleb, 2013; Beyer, 2014; Maškarinec, 2014; Novotný, 2014; Bolleyer et al., 2015; Charvát, 2015; Fredriksson, 2015; Novotný, 2015).

The paper herein focuses on a case study of one of the parties of pirate family, namely the Czech Pirate Party (hereinafter referred to as Pirates). The main aim of the work is a spatially econometric analysis of voter support of the Pirates in the parliamentary and European elections in the years 2010–2014, with a focus on (in)stability of influence of geographic (spatial) patterns on voter support for the Pirates. The choice of techniques developed within the framework of spatial econometrics is guided by the findings that the use of classic statistical methods for the analysis of voter behavior encounters a methodological problem, which limits their applicability and is associated with specific characteristics of spatial

[3] The Swedish Pirate Party won 7.13% of votes in the European elections and one of the eighteen Swedish mandates in the EP, but its success could no longer be repeated in the parliamentary elections held in 2010, when it received only 0.65% of the votes (cf. Erlingsson and Persson, 2011; Maškarinec, 2014). Icelandic Pirates (Píratar) then received in the parliamentary elections in 2013 a total of 5.10% of the votes and three of the 63 mandates (cf. Maškarinec, 2013, p. 81-84) and in 2016 even 14.48% of the votes and 10 mandates.

data, i.e. their spatial nature. Spatially or geographically referenced data are 'special' as they are collected on the basis of, and biased by, identifiable locations or places (Shin and Agnew, 2011, p. 9). "Special" nature of spatial data primarily leads to two problems, i.e. the fact that spatial data almost invariably exhibit some form of spatial autocorrelation or spatial dependence, which is based on the so-called first principle of geography that "everything is linked to everything, but close things are more related than distant things." (Tobler, 1970, p. 236).

Since their establishment in April of 2009, the Czech Pirates have experienced a gradual but almost steady increase in support, at all levels of governance. While in the municipal elections in 2010 the Pirates won only three mandates, four years later it was already 17 mandates and further 51 mandates were gained by coalitions, which Pirates helped to form. Similarly, while in the 2012 regional elections the Pirates received a total of 2.19% of the votes (from 1.41% in the Zlín region to 3.03% in the Central Bohemian Region) and no mandate, in 2016 the gains of the Pirates (running both independently as well as in coalitions with the Green Party or the movement Change) ranged between 1.77 to 5.46%, while their gains dropped below the 2% threshold in only one region, while they exceeded the 5% threshold in three out of 13 regions, which resulted in the gain of five mandates (of which three independently and the other two each in coalition with the Greens, or the movement Change).

In 2012, the Pirates even won parliamentary representation when a joint candidate for the Pirates, Greens and Christian Democrats, Libor Michálek (running as a non-partisan candidate), won the senatorial mandate in the district of Prague 2; similarly, two other candidates running in broad coalitions, including even the Pirates, succeeded in the elections to the Senate in 2016 (Ladislav Kos in Prague 11 and Renata Chmelová in Prague 10), although in this case – unlike the year 2012 – the Pirates were not the proposing party. An increase in voter support was also noticeable in the elections to the lower house of parliament. In their first participation in the parliamentary elections of 2010 the Pirates received only 0.80% of the votes, in the ensuing parliamentary elections in 2013 it was already 2.66% of the votes, and in the EP elections in 2014 they narrowly missed the 5% allocation clause (4.78% votes).[4]

Questions that can be asked following the results of recent Czech parliamentary and European elections, are in particular as follows: a) what is the size of regional disparities in the election results of the Pirates; b) what is the level of stability of the spatial patterns of support for the Pirates; c) what is the territorial distribution of electoral base of the Pirates; d) has there occurred

[4] Czech parliament consists of two chambers – the upper chamber (the Senate) and the lower chamber (Chamber of Deputies, PS). When, however, the term "parliament" is being used in the text, it refers to the lower house of parliament.

any significant change in voter patterns of territorial support for the Pirates?; e) what are the factors of electoral support for the Pirates?; f) has there occurred any change in the factors explaining the differences in inter-regional voter support for the Pirates?; g) is any role (which role) played amidst these factors by spatial independent variables or support for the Pirates may best be explained by non-spatial independent variables?

1 DATA AND METHODS

Analytical units are 205 administrative districts of municipalities with extended powers (SO ORP) and the capital city of Prague. The reason for a choice of this aggregate level is the fact that districts (spatial units corresponding with the level of NUTS 4/LAU 1) as political and administrative units, do not correspond to catchment areas. They contain areas with significantly different territorial patterns of voter support for individual political parties. For these reasons, an analysis operating at the district level may provide a somewhat distorted view of reality, blurring intra-regional differences (Musil, 2004; Spurná, 2008; Feřtová and Temelová, 2011; Novák and Netrdová, 2011). The necessity to work at a lower level of aggregation was also highlighted by analyses of the geographical dimension of Czech social inequalities (e.g., Feřtová and Temelová, 2011; Novák and Netrdová 2011) carried out on smaller territorial units. They conclusively proved that the choice of the district or regional level tends to hide profound intra-regional disparities. On the other hand, according to Musil and Müller (2008), municipalities are not considered fully adequate units of analysis because there is a large number of very small municipalities with extreme variance of selected variables.[5] Selection of this territorial level of monitoring is also guided by the fact that these units represent relatively natural regional units, allowing to adequately assess detailed geographical patterns of voter behavior in the Czech Republic. Moreover, a regional level SO ORP has also been chosen for its good explanatory characteristics in terms of territorial similarity of the observed units.

Using aggregate data may be also justified by the theoretic anchoring of the article, given that its objective is not examining individual causes of voter behavior, but instead an analysis of the success of the party at an aggregate level, i.e. an analysis of a territorial variation of the below-identified factors affecting voter support for the Pirates. Due to the use of aggregate data, however, we

[5] The settlement and administrative structure of the Czech territory is extremely fragmented, with a high number of small municipalities. At present, out of the total of 6,253 municipalities, 4,829 (77.23%) have fewer than 1,000 inhabitants, but comprise only 17.04% of the population. Similarly, there are 1,461 (23.36%) municipalities with fewer than 200 inhabitants whose population accounts for only 1.73% of the total (CZSO).

deem it necessary to emphasize that in case of the acquired findings it is not the study of an individual, but the monitoring unit is represented by a community of people living in a given territory. Thus, the results of statistical analysis can be considered valid for the selected configuration of units (see King, 1996; Wong, 2009).

The first research problem entails the size of regional disparities of election results and stability of the spatial patterns of support for the Pirates. To determine the spatial variability of electoral gains, the values of coefficient of variation (CF) will be calculated and expressed as a percentage. Stability of spatial patterns of voter support for the Pirates between pairs of consecutive elections as well as over the whole observed period will be measured by Pearson's correlation coefficient (r).

However, spatial data almost invariably exhibit some form of spatial autocorrelation or spatial dependence, whereby locations in close proximity tend to have more similar attributes than do locations further apart. This violates the basic assumption of the general (aspatial) linear model and many other standard parametric statistical tests, namely that individual observations are independent or uncorrelated with one another, and creates the problem of autocorrelation of errors across territorial units (Cliff and Ord, 1981; Brunsdon, 2009; Fortin and Dale, 2009). Moreover, these spatial patterns can be indicative of the underlying processes and actors that generate them and modify them in time (Fortin and Dale, 2009). Another property of many spatial data sets is that data collection might exhibit spatial heterogeneity or nonstationarity – i.e. the processes generating observed attributes might vary over space, rather than being constant as assumed by most traditional types of statistical analysis (Brunsdon et al., 1996; Fotheringham, 2009). The presence of spatial autocorrelation then produces the effect that the ordinary least squares (OLS) regression coefficients are biased and/or inefficient.

Thus, together with above mentioned traditional statistical techniques, we have used several spatial techniques to control for the influence of spatial effects and analyze the voter support for the Pirates between the elections of 2010 and 2014. Our exploration of the spatial structure of electoral support begins with the formal detection of spatial autocorrelation, using Moran's I statistic (MI), which is now the most commonly used indicator of spatial autocorrelation (Cliff and Ord, 1981). The statistic enables the measurement of spatial clustering and identification of spatial clusters and spatial outliers in the studied data set.

Values of Moran's I range between –1 and +1. A value of –1 identifies a perfect negative autocorrelation, a value of +1 a perfect positive spatial autocorrelation, and a value of 0 indicates a random pattern of spatial clustering in the data. In

other words, when the high values in one unit are accompanied by high values in adjacent units (or areas with low values are mutually adjacent), this is a positive spatial autocorrelation or spatial clustering. Conversely, when the areas with low values are surrounded by areas with high values (or vice versa), it is a negative spatial autocorrelation, which allows for identification of spatial deviation, representing the cases of spatial randomness (accidentality) of the observed phenomenon (Fotheringham et al., 2002).[6]

However, Moran's I is an overall measure of linear association, whose single value is valid for the entire study area. Given the aim of this study is to analyze voter behavior at a lower level of aggregation in order to identify potentially different patterns of voter behavior within larger units, a local indicator of spatial association (LISA; or local Moran) has been used to obtain more detailed insight into how electoral support was clustered throughout the Czech Republic's territory. Using LISA indicators enables visualization of spatial clustering of support for the party among the surveyed units, which we will supplement comparing electoral maps at the level of SO ORP. Comparing the maps should outline how the Pirates managed from a territorial point of view to build on successes/failures in previous elections; a measure of support for the Pirates will be displayed using quantiles.

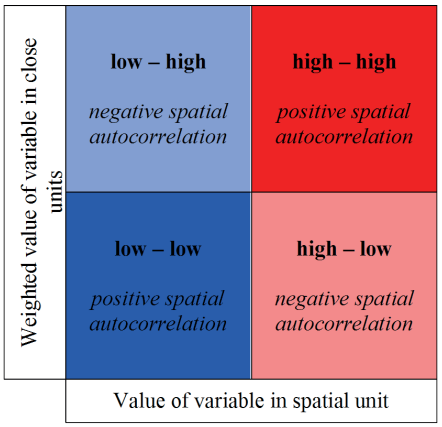
Local Moran's I statistics reflect the level and direction of the contribution of each individual observation to the overall global statistic, and can be used for visualizing maps of spatial clustering. The mean local Moran's I is equivalent to the global Moran's I value, since the sum of all local indicators is proportional to the value of the global Moran. A local Moran's I statistic is calculated for each observation, and significant values can be mapped to identify cases of positive or negative spatial dependence (i.e. high values surrounded by similarly high values, or low values surrounded by similarly low values), or spatial outliers (i.e. high values surrounded by low values, or low values surrounded by high values) (Anselin, 1995).[7]

[6] Prior to calculating the indicators of spatial autocorrelation and spatial regression models, one of the methodological problems of spatial data analysis must be resolved. It relates to the fact that the concept of operationalization of spatial proximity (in terms of delimitation of adjacent spatial units) can lead to very different results (Unwin and Unwin, 1998). The presented work leans towards the choice of discrete spatial weighted scheme of queen (of the first order), i.e. a scheme of connection using a movement of chess pieces. Only such units will be regarded as adjacent whose boundaries share common points. The reason for this choice is, on one hand, (in many cases) a relatively large size of the monitored units, but also the fact that the examined units often differ considerably in their size. For more on the methodology of calculation of indicators of spatial autocorrelation see Spurná (2008).

[7] However, it is important to say that the value of the Moran's I statistic (both global and local) does not indicate statistical significance. To reject the null hypothesis of no spatial autocorrelation, the statistical significance of the global and local Moran's I values thus will be verified using

LISA indicators can be categorized (according to the type of spatial autocorrelation) into four groups corresponding to four quadrants of the Moran diagram, and thus identify the units with positive or negative spatial dependence. Maps representing the values of all four quadrants of the Moran diagram will be employed in our work (see Figure 1). Bearing in mind that our goal is to compare differences in the clustering of support for the Pirates between the elections, we will use both common LISA indicators that can show the clustering of support for the party in one election, as well as bivariate LISA indicators that allow to compare the clustering between pairs of elections. Similarly, we will apply bivariate LISA indicators for mutual comparison of voter support for the Pirates and other parties in the EP elections of 2014, which should demonstrate whether (to what extent) territorial support for the Pirates coincides with the support for other Czech parties.

Figure 1: Moran diagram



Source: author

However, the local Moran's I statistic is useful especially for descriptive analysis of the given phenomenon, while at the same time detection of spatial autocorrelation in a data set has implications for other statistical techniques (especially for regression analysis). Therefore, there is a reason to use methods which are able to counter the effects of spatial structure in the data set as well as the contamination of the error term with spatial autocorrelation. A spatial interaction thus will be integrated in the regression model specifications by

conditional randomization (i.e. the permutation approach – see Anselin, 1995, p. 95-96).

means of two spatial econometric strategies, the so-called *spatial lag* and *spatial error* models (Anselin, 2002).

The dependent variable is the share of votes of the Pirates at the level of SO ORP and the capital city of Prague. As independent variables were used variables that previous researches identified as the most important predictors of voting behavior in the Czech Republic and also those where previous researches confirmed the impact on the gains of pirate parties, with regard to the availability of data at the aggregate level. Following the year of 1990, Czech politics was characterized by relatively a smooth onset of the left-right axis, which gradually (but quite quickly in comparison with other post-communist states) assumed its traditional socio-economic content and represented a major cleavage within a Czech party system (Vlachová and Matějů, 1998; Hloušek and Kopeček, 2008). Similarly, other studies have shown that a political conflict in the Czech Republic is a class conflict and social classes vote for political parties that defend their class interests (Smith and Matějů, 2011). At the same time, these studies have implied that social class by itself does not quite adequately explain voter behavior and the role in the decisions of voters is also played by a status position of the voters (employment sector, religiosity, age, etc.), or other factors such as unemployment or party identification, which can significantly modify the behavior of social classes (cf. Lyons and Linek, 2007; Matějů and Řeháková, 1997; Vlachová and Řeháková, 2007; Lyons, 2012).

Analyses of voter behavior of regional populations in the Czech Republic later showed that regional differences in political attitudes are not merely a reflection of socio-demographic diversity in the composition of these populations, because the population of the region is not merely the sum of individuals living in the given region and contextual variables can be as important as composite variables. Political orientations of an individual are not created without the context of the environment in which the individual lives, and territorial context can significantly influence both the objective position of the individual in society as well as his subjective perception of the personal situation and the situation in the society as a whole (Kostelecký et al., 2002; Kostelecký and Čermák, 2004). Finally, a certain degree of influence of contextual factors were also found by spatial analyses carried out in the Czech Republic, which identified independent effect of two macro-regions on voter behavior. The first was the Sudetenland, in the past predominantly inhabited by German population, which affected the gains of Communist Party of Bohemia and Moravia (KSČM) and liberal-conservative Civic Democratic Party (ODS) in the parliamentary elections in 1990–2006 (Kouba, 2007), and the success of new parties (Public Affairs [VV], ANO2011, Dawn of Direct Democracy of Tomio Okamura [referred to as "the Dawn"]) in

the parliamentary elections in 2010, or 2013 (Maškarinec and Bláha, 2014).

Should we turn to the researches mapping the electoral base of pirate parties, we can conclude that the pirates are enjoying electoral support especially among first-time voters and young men and inhabitants of larger cities with higher education, or still studying with respect to their often low age (cf. Brunclík, 2010, p. 23). Erlingsson and Persson subsequently showed, when analyzing the success of Swedish pirates in the European elections in 2009, that voters of the pirates were recruited mainly among young men, without their own housing, and their analysis surprisingly did not confirm that voting for the pirates was led by protest voting but on the contrary its reason was rather issue voting (cf. Erlingsson and Persson, 2011, p. 125-126; Maškarinec, 2014).

Raw electoral results were obtained from the Czech Statistical Office's (CZSO) Election Server and matched to other demographic and economic data sets at the same level of aggregation. The data set of socioeconomic indicators was compiled from two basic sources: the decennial population census of 2011, and other CZSO statistics. Socioeconomic status as the main source of structural cleavage of Czech politics is expressed as unemployment (proportion of the unemployed population) and the number of self-employed per 1,000 inhabitants. The other independent variables represent the most common bases of stratification: higher education (proportion of people with tertiary education), retirement (proportion of the population aged 65 and over) or contextual variables that characterize the situation of the regional populations: urbanization (proportion of the population living in municipalities with 5,000 or more inhabitants), Sudetenland (dummy variable dividing the Czech territory into units whose territory is or is not located in the formerly German-inhabited Sudetenland – value 1, or 0) and Moravia (dummy variable which equals 0 for Bohemia and 1 for Moravia or Silesia).[8]

2 RESULTS AND DISCUSSIONS

2.1 Spatial variation and spatial clustering of voter support for the Pirates

During the first step of analysis two basic statistical indicators were calculated (Table 1), variation coefficient and a global Moran's I, for the two most recent parliamentary elections in 2010 and 2013, which result in strongly destabilized Czech party politics at the systemic level by changing the relative strength of parties (see Linek, 2014). As in the past, the highest levels of spatial autocorrelation of electoral support were exhibited (all the following values apply to the year 2013) by the Christian Democratic Union – Czechoslovak People's Party (KDU-

[8] Variable of Catholics (the proportion of the population adhering to Roman Catholic Church) was excluded from the analysis because of its high multi-colinearity with the variable of Moravia.

ČSL) (0.698), followed by the parliamentary newcomer from 2010 the Tradition, Responsibility, Prosperity 09 (TOP09) (0.651) and the Czech Social Democratic Party (ČSSD) (0.595). Only slightly lower levels of spatial autocorrelation were observed for the ODS and the newcomer from 2013, the Dawn (0.591 and 0.526, respectively). Like in the preceding elections, the lowest level of spatial autocorrelation of all parties with permanent parliamentary representation was enjoyed by the KSČM (0.485). However, the lowest level of regionalization of electoral support was identified for some of the new parliamentary parties: the VV (in 2010, 0.403), and the ANO2011 ("ano" means "yes" in Czech) (0.456). We may also encounter similar values in the European elections in 2014, with one exception, which is a significantly higher clustering of support for the ČSSD, associated with an overall lower success of the Social Democrats in the European elections, where their gains are more concentrated in the traditional areas of support for the party.

Table 1: Voter support, regional variability, and Moran's I scores for parties with representation and the Pirates, 2010–2014

	2010			2013			2014		
	%	*CV*	*MI*	%	*CV*	*MI*	%	*CV*	*MI*
ČSSD	22.8	17.26	0.596	20.45	16.52	0.595	14.17	25.89	0.739
ODS	20.22	17.35	0.557	7.72	26.59	0.591	7.67	22.1	0.527
KSČM	11.27	23.42	0.438	14.91	21.97	0.485	10.98	27.10	0.431
KDU-ČSL	4.39	70.67	0.724	6.78	57.59	0.698	9.95	68.50	0.728
SZ	2.44	30.51	0.403	3.19	30.9	0.426	3.77	33.44	0.416
TOP09	16.70	26.68	0.572	11.99	37.12	0.651	15.95	37.12	0.723
VV	10.88	14.30	0.454	-	-	-	0.46	0.420	0.217
ANO2011	-	-	-	18.65	13.68	0.456	16.13	18.16	0.535
Dawn	-	-	-	6.88	22.69	0.562	03.12	27.98	0.328
SSO	0.74	28.72	0.306	2.46	25.1	0.421	5.24	27.44	0.438
Pirates	**0.80**	**27.24**	**0.279**	**2.66**	**22.35**	**0.427**	**4.78**	**19.99**	**0.421**

Source: CZSO (2016); own calculation employing the program OpenGeoDa 0.9.9.14.

Should we now turn to the Pirates, we can see that a gradual increase in support is accompanied by a decrease in regional variability of voter support for the Pirates, which in comparison with other parties ranks among the lower one. On the other hand, however, this phenomenon is accompanied by an increase in a spatial clustering of voter support for the Pirates, which after the parliamentary elections in 2013 and the European elections of 2014 exceeded the value of 0.4. Even so, the regional clustering of electoral support for the Pirates in the long term ranks among the lowest, and reaches similar values as is, for instance, displayed by a global clustering of electoral support for the Green Party (SZ).

Should we attempt to explain electoral stability (uniformity) of the electorate of the Pirates (Table 2), we can conclude that the interdependence of the results of the party between pairs of consecutive elections does not rank among the strongest. Between the parliamentary elections in 2010 and 2013 it reached the values of a significant to a very strong correlation (0.625), similar to the parliamentary elections in 2013 and EP elections in 2014 (0.695); however, between the parliamentary elections in 2010 and the EP elections in 2014 it reached only a significant correlation (0.481), suggesting a considerable spatial variability of support for the party. Even lower values are reached by a clustering of support for the Pirates, which is far more stable, yet remains at the levels of low to moderate correlation.

Table 2: Uniformity and clustering of voter support for the Pirates, 2010–2014

Pearson correlation			
	PS 2010	PS 2013	EP 2014
PS 2010	1	0.625	0.481
PS 2013	0.625	1	0.695
EP 2014	0.481	0.695	1
Moran's *I* scores			
	PS 2010	PS 2013	EP 2014
PS 2010	1	0.276	0.216
PS 2013	0.276	1	0.319
EP 2014	0.216	0.319	1

Source: CZSO (2016); own calculation.

Comparing uniformity of voting patterns of the Pirates with other parties (Table 3) provides interesting information. It shows that in terms of the spatial distribution of support the Pirates clearly detach themselves from a block of left-wing parties (Communists and in particular Social Democrats), and even more substantially their regional support differs from the KDU-ČSL. By contrast, the associations of voting patterns of the Pirates and right-wing parties, but also of the Greens and ANO2011 reach mostly positive values, and especially between the parliamentary elections in 2013 and the EP elections in 2014 they fluctuated in the zone of middle to significant correlation.

However, the added value of spatial analysis lies not "only" in demonstrating the existence of spatial autocorrelation but, more importantly, in identifying areas with different patterns of spatial autocorrelation in order to say whether the distribution of electoral support is structured spatially and concentrated into specific regions. Therefore, in the following part of the text we will focus on identifying local measures of spatial clustering of voter support for the Pirates and finding the factors behind the electoral success/failure of the Pirates, or (in) stability of these factors.

Table 3: Uniformity of voter support for the parties and the Pirates, 2010–2014 *(r)*

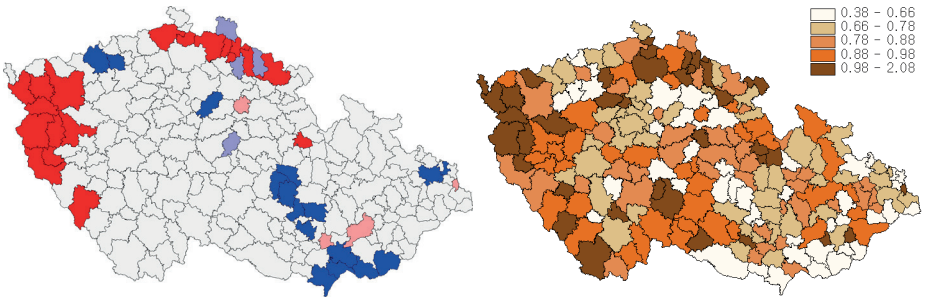
	ČSSD	ODS	KSČM	KDU-ČSL	TOP 09
Pirates (2010)	–0.219	0.111	0.019	–0.260	0.203
Pirates (2013)	–0.332	0.472	–0.209	–0.359	0.418
Pirates (2014)	–0.379	0.343	–0.128	–0.534	0.390
	SZ	ANO2011	SSO	Dawn	VV
Pirates (2010)	–0.017	-	0.130	-	0.127
Pirates (2013)	0.311	0.229	0.214	0.125	-
Pirates (2014)	0.520	0.472	0.415	–0.025	0.145

Source: CZSO (2016); own calculation.

To a certain extent in agreement with the found values of global spatial autocorrelations, LISA indicators also confirm variability (instability) of spatial clustering of support for the Pirates, which is at the same time restricted to a rather small number of regions, which – in addition – undergo great transformations between the elections. While in the parliamentary elections in 2010 the clusters of units with high support for the party appeared mainly in the west (regions

of Karlovy Vary and Pilsen) and in the northeast and in eastern Bohemia (from Děčín to Trutnov), almost always adjacent to the state border, in the parliamentary elections in 2013 this area further spread to western Bohemia, and the area in northern Bohemia was dramatically transformed and restrained to the areas of Liberec, Jablonec and Semily.

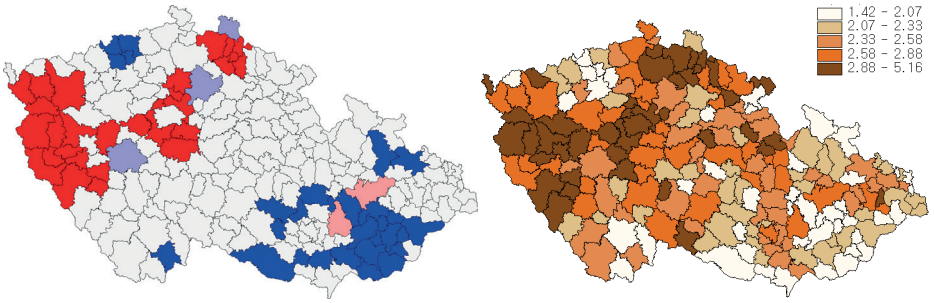
Figure 2: Moran's I cluster maps (LISA) and the distribution of support (quantiles) for the Pirates, 2010



Source: CZSO, own calculation employing the program OpenGeoDa 0.9.9.14.

At the same time there emerged a new area around Prague, following on the cluster of units in western Bohemia and implying a direction for connection to the area around Liberec. Finally, the EP elections in 2014 witnessed a near disappearance of the area of continual high level of support for the Pirates in western Bohemia, while there emerges a new continual area linking the area around Prague (now also including the capital city) and heading further in north-easterly direction over Mladá Boleslav to northeastern Bohemia (area around Liberec). In contrast, the clusters of adjacent units with low support for the Pirates did face transformation, but they largely concentrated in the southeast Moravia (areas of Vsetín, Zlín), joined by the areas of Bruntál and Opava in North Moravia, several units north of Brno and the area of Znojmo in South Moravia. A similar pattern, albeit more compact and expanding to the area of Ostrava, and including the Jeseník area, can be found in the EP elections of 2014 as well.

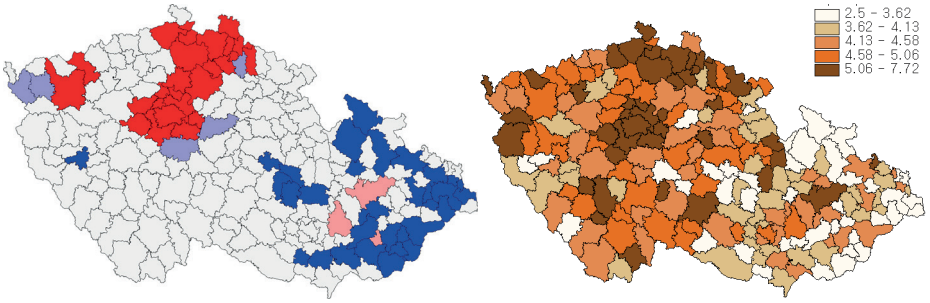
Figure 3: Moran's *I* cluster maps (LISA) and the distribution of support (quantiles) for the Pirates, 2013



Source: CZSO (2016), own calculation employing the program OpenGeoDa 0.9.9.14.

Overall, it may be asserted that the above-mentioned areas, identifying the clusters of units with high voter success of the Pirates, largely copy the areas, which previous studies of the spatial patterns of socioeconomic differentiation identified as areas with the high development potential (e.g., Blažek and Netrdová, 2009; Novák and Netrdová, 2011). In this context, the results of the Pirates show that the party ranks, with regard to its territorial support, rather among more traditional (right-wing) parties. Historically, in case of most political parties with long-term parliamentary representation, areas of high development potential (especially the axis connecting Prague with the regional capitals of western Bohemia, Pilsen, and north-eastern Bohemia, Liberec) largely overlapped with the regions of high support for the right (ODS, TOP09) and low support for the left (ČSSD, KSČM); the industrial agglomeration of Ostrava/Karviná/Frýdek-Místek was an exception, and vice versa – left-wing parties (especially KSČM) were preferred in the regions with low development potential.

Figure 4: Moran's *I* cluster maps (LISA) and the distribution of support (quantiles) for the Pirates, 2014



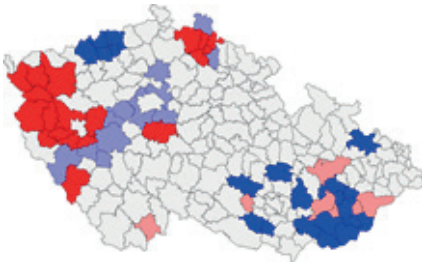
Source: CZSO (2016), own calculation employing the program OpenGeoDa 0.9.9.14.

Similarly, the map portrayal of LISA bivariate indicators between individual pairs of elections demonstrates only a limited linkage of the areas where the units with a high or low support for the Pirates congregate. The areas with high gains of the Pirates in the parliamentary elections in 2010 and 2013 were limited only to a smaller part of western, and even to a lesser extent, north-eastern Bohemia, while the clusters of low support for the party rather concentrated in southeast Moravia. In contrast, comparison between the parliamentary elections in 2010 and the EP elections in 2014 confirms a persisting weak electoral base of the Pirates in both elections in southeastern Moravia, newly expanding to the part of northern Moravia. By contrast, a cluster of high support for the Pirates on one hand significantly grew in northeast Bohemia (from Děčín in the Ústí region, through the areas of Liberec and Jilemnice on the border with the Hradec Králové region, and Mnichovo Hradiště in the north of the Central Bohemian region), but on the other hand it significantly declined in western Bohemia.

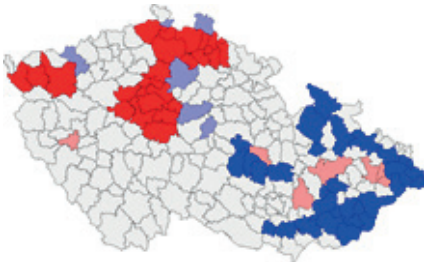
Finally, the last two elections underlined the above described transformation in voter patterns of regional support for the Pirates, in the direction of copying the units with high potential for development. The result then was that the units with high support for the Pirates in the parliamentary elections in 2013 and the European elections in 2014 created a compact cluster heading from Central Bohemia and Prague through the area of Mladá Boleslav up to the Liberec area (again from Děčín through the areas of Liberec and Jilemnice), supplemented by a smaller cluster of units in west Bohemia. Similarly, the areas with identically low electoral base remained in Moravia only, but even there was an increase in the compactness of this territory, including both southeast as well as North

Moravia, complemented by a few units on the border of the Pardubice and South Moravia regions.

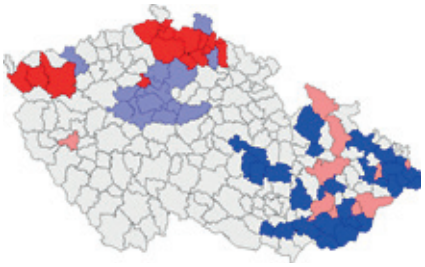
Figure 5: Moran's *I* cluster maps (bivariate LISA) for the Pirates between elections, 2010–2014



Chamber of Deputies 2010 / 2013



Chamber of Deputies 2013 / EP 2014



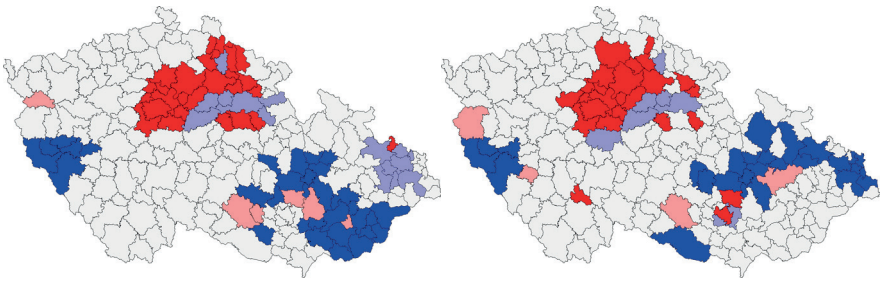
Chamber of Deputies 2010 / EP 2014

Source: CZSO (2016), own calculation employing the program OpenGeoDa 0.9.9.14.

Finally, interesting findings are offered by the maps comparing the areas where there occurs a mutual aggregation of high or low support for the Pirates and other parties (given the limited scope of the text, in this case we will only focus on the EP elections in 2014). In this case it is once again confirmed that the Pirates rank among a group of parties (mainly right-wing oriented) whose electoral base is, with a few exceptions, mainly concentrated in Bohemia. Should we address the right-wing parties, where already the values of mutual uniformity of voter patterns identified substantial congruency of their voter patterns with an electorate of the Pirates, then we can see that when comparing support for the Pirates and ODS there arises a relatively continual area of high gains of both parties, starting in Prague and its surroundings and running through Central Bohemia to northeastern and eastern Bohemia (however, it does not include the regional centers Liberec or Hradec Králové). Similarly, there is congruency in

the regions where the Pirates and ODS have weak electoral base; this includes southeast Moravia and continues to the edge of the Pardubice region, but on the other hand, both parties diverge in the Ostrava area and in the part of aforementioned Hradec Králové region, where ODS is much stronger than the Pirates. The map illustrating the units of high support for the Pirates and Party of Free Citizens (SSO) exhibits a very similar pattern of support as in the case of ODS.

Figure 6: Moran's *I* cluster maps (bivariate LISA) for the Pirates and other parties, 2014

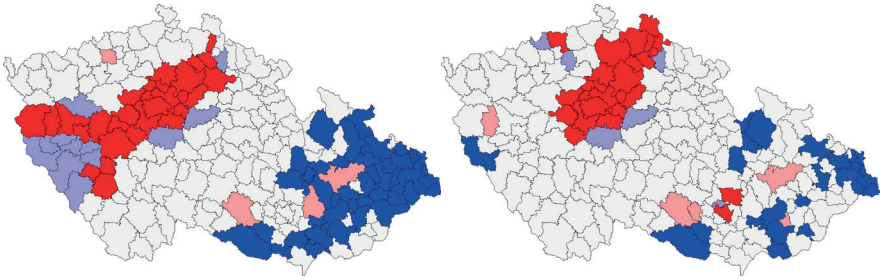


Pirates / ODS Pirates / SSO

Source: CZSO, own calculation employing the program OpenGeoDa 0.9.9.14.

A similar pattern is also displayed by the map illustrating the units with a congruently high support for the Pirates and the Greens, that once again runs from Prague and Central Bohemia to the Liberec area, but unlike the maps indicating congruency of electoral base of the Pirates with ODS and TOP09, it covers almost all the entire Liberec area. A similar claim also applies to the territorial stratification of mutual clusters of high support for the Pirates and TOP09, with one important difference, though. Specifically the fact that a large cluster of support for the Pirates TOP09 already starts in western Bohemia (on the border with Germany) and runs through Pilsen and Prague to northeast Bohemia and thus almost ideally copies the units with the greatest development potential. However, there are significant differences in the regions with low support for both entities, or in those where their gains significantly diverge, while in the case of the Greens there is only a limited congruency with several units scattered (almost exclusively) in the space of Moravia.

Figure 7: Moran's I cluster maps (bivariate LISA) for the Pirates and other parties, 2014

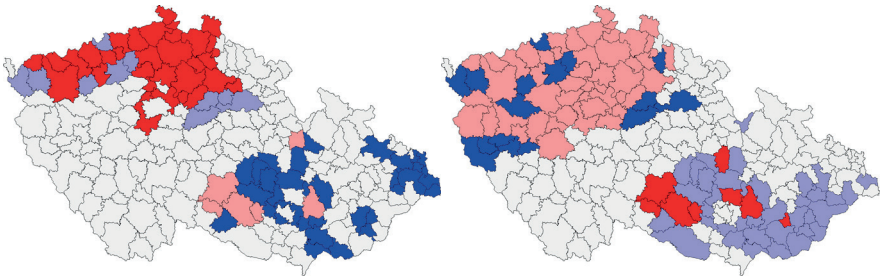


Pirates / SZ Pirates / TOP09

Source: CZSO, own calculation employing the program OpenGeoDa 0.9.9.14.

The last of the parties where it was possible to find larger clusters of mutually high support with the Pirates, was ANO2011. Also in this case the detected pattern partly copies the clusters of support found with right-wing parties. Congruent areas with high support for the Pirates and ANO2011 are located in Central Bohemia (especially to the north of Prague, and also without the capital) and continue to eastern and north-eastern Bohemia. However, unlike other right-wing parties this continual cluster of high support for the Pirates and ANO2011 continues alongside the border with Germany and also across northwestern Bohemia (via Ústí area) and partly stretches to Karlovy Vary area (Kraslice, Ostrov, Karlovy Vary).

Figure 8: Moran's *I* cluster maps (bivariate LISA) for the Pirates and other parties, 2014

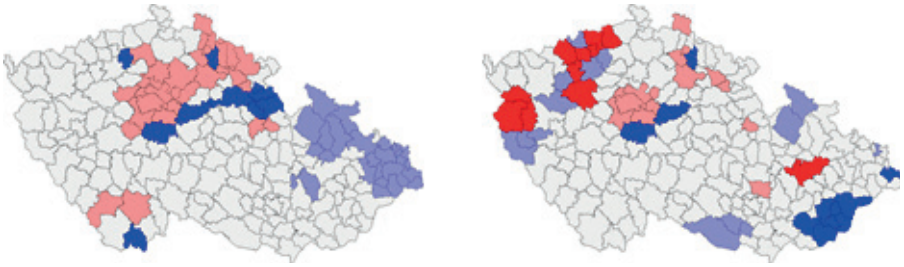


Pirates / ANO2011 Pirates / KDU-ČSL

Source: CZSO, own calculation employing the program OpenGeoDa 0.9.9.14.

In contrast, in the case of left-wing parties, but also KDU-ČSL, only a limited congruency of the areas with high support for these entities and the Pirates can be found. In case of the Social Democrats there appears no such unit, but on the contrary we can see that where the Pirates enjoy high support (the area heading from Prague in the direction of northeast and east), the Social Democrats are very weak. Conversely, North Moravia (stronghold of Social Democrats) is an area with a limited electoral base of the Pirates. Partly a similar claim applies for congruency with the regions with high or low support for KDU-ČSL. In this case, de facto the whole Bohemia north of Prague is the area where the Pirates have high and KDU-ČSL low support, while the opposite is true for a large part of Moravia (with the exception of northern Moravia). In the case of KSČM there exists a limited number of units with a high level of support for the Pirates as well as KSČM in the north and west Bohemia (Ústí nad Labem, Teplice, Bílina, Most, Chomutov, Žatec), extending into Central Bohemia (Rakovník). Similarly, only to a limited extent we find the areas with congruently low support for both entities, almost exclusively in southeast Moravia (from Uherský Brod, or Uherské Hradiště, via Zlín all the way to Vsetín). These units are then complemented by the units with opposite electoral base of both entities, especially in Prague and its immediate surroundings, where the Pirates are strong and communists weak, and the parts of northwest, west Bohemia and north and south Moravia, where the opposite is true.

Figure 8: Moran's *I* cluster maps (bivariate LISA) for the Pirates and other parties, 2014



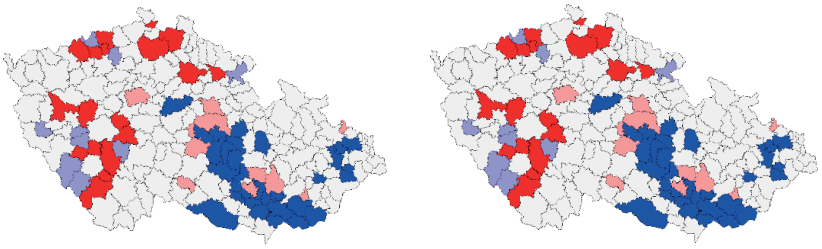
Pirates / ČSSD Pirates / KSČM

Source: CZSO, own calculation employing the program OpenGeoDa 0.9.9.14.

As in the case of left-wing parties, there is only a limited congruency in territorial support for the Pirates and populist parties, which is also confirmed by the above stated values of electoral uniformity of these parties and the Pirates. Especially when

comparing voter patterns of the Pirates and the Dawn in the EP elections in 2014, we encounter only a minimum number of clusters of mutually high and low support for both parties. In this regard the most important is the cluster that exhibits a high support for the Pirates originating in Prague and moving to the south, which matches very low gains of the Dawn in this area. In case of congruency of regional support for the Pirates and VV, the number of clusters is more pronounced (in general, the units with high support for the parties are rather found in Bohemia, whereas low in Moravia); nonetheless, in this case it is necessary to approach interpretation of the findings very carefully, considering a very weak result of VV in the elections.

Figure 9: Moran's *I* cluster maps (bivariate LISA) for the Pirates and other parties, 2014



Pirates / Dawn Pirates / VV

Source: CZSO, own calculation employing the program OpenGeoDa 0.9.9.14.

2.2 Determinants of voter support for the Pirates

LISA indicators are particularly important for descriptive analysis of the observed phenomenon. On the other hand, detection of spatial autocorrelation in the values of the observed variable can cause problems in the statistical analysis of data. Therefore, in order to analyze the relationship between support for the Pirates and selected independent variables spatial regression will be employed and its results will be compared with the results of a classic method of the least squares (OLS). The so-called spatial lag model will be used, as spatially diagnostic tests indicated its better parameters when compared to spatial error model.

The basic comparison of the models shows (due to the scope only the results of spatial regression are presented) that the spatial lag model bears greater explanatory power than the OLS model. On the other hand, as pointed out by Anselin (2005, p. 218), the output of spatial regression is not the real R^2 but the so-called pseudo-R^2, which is not fully comparable with the outputs of OLS and, therefore, it is necessary to check the suitability of spatial lag model using other

statistics (Anselin, 2005, p. 175); namely, the Log-likelihood statistic, Akaike information criterion (AIC) and the Bayesian Schwarz information criterion (BIC).[9] It generally applies that the higher explanatory power of spatial lag model when compared with OLS model is implied by a higher value of the Log-likelihood statistics and, conversely, lower values of AIC and BIC. Comparison of the resulting values then showed that all spatial lag models meet these criteria and thus the applied spatial lag model emerges as a more reliable tool to verify the examined relationships than the traditional method of OLS.

When in the first step we focus on analyzing the impact of spatial variables, we may conclude that their impact confirms the previous findings that identified the independent impact of the macro-region of the Sudetenland in the parliamentary elections of 1992–2006 (Kouba, 2007), i.e. the difference between the regions falling under the Sudetenland, which was inhabited mainly by German-speaking population before the end of the Second World War, and the rest of the Czech territory. Simultaneously, a substantial variation in the power of this variable over time was identified. While in 2010, when running for the first time, the Pirates gained in the Sudeten areas in the parliamentary elections on average only by 0.07% of the votes more in comparison to the rest of the country, in 2013 it was already 0.12% and in the EP elections in 2014 even 0.84% of the votes. Even greater effect was exhibited by a variable of Moravia. While in 2010 the support for the Pirates in Moravia was lower on average by only 0.05% and in 2013 by 0.14%, in the European elections their losses in this area rose on average to 0.52%. Both of the aforementioned examples raise the question whether, or to what extent, the rise, or drop in the support for the Pirates in 2014 was due to the effect of second-order elections (Reif and Schmitt, 1980), when voters more frequently vote by the "their heart" (the so-called sincere voting) because they do not fear to waste their votes, compared with parliamentary elections, which rather features a typical strategic voting, or a much lower voter turnout (see below).

Support for the Pirates, however, is not affected by spatial modes only. When excluding the impact of contextual factors, nonspatial characteristics of populations of the monitored units display a certain level of influence, although it is important to assert that the influence of the majority of used predictors is relatively low. Logic and combination of variables is in most cases quite easily explainable and interpretable. At the same time, the power of individual predictors of support for the Pirates exhibits a high degree of stability. If we undertook to generalize our findings, it can be stated that a positive influence on the choice of the Pirates was exercised by growing urbanization and conversely

[9] These statistics are based on the assumption of multi-dimensional normality and corresponding function of likelihood of a standard regressive model.

the negative impact by aging population. This confirms the fact that the Czech Pirates find their support in more urbanized rather than rural environment and among the younger generation. In addition, the Pirates enjoyed higher support amidst entrepreneurs and conversely lower amidst the unemployed, the influence of both variables was relatively constant, although relatively low.

Table 4: Effects on voting for the Pirates, 2010–2014 (spatial lag model)

	PS 2010	PS 2013	EP 2014
Self-employment	0.002 (0.001)	0.005 (0.003)	0.008 (0.005)
Unemployment	–0.008 (0.007)	–0.032 (0.015)	–0.004 (0.023)
Higher education	–0.016 (0.008)	–0.006 (0.018)	0.035 (0.028)
Retirement	–0.008 (0.012)	–0.012 (0.025)	–0.048 (0.039)
Urbanization	0.001 (0.001)	0.004 (0.002)	0.007 (0.003)
Moravia	–0.052 (0.041)	–0.144 (0.091)	–0.521 (0.149)
Sudetenland	0.074 (0.040)	0.116 (0.085)	0.261 (0.134)
Constant	0.455 (0.244)	1.113 (0.537)	2.227 (0.892)
Log-likelihood	37.886	–122.645	–212.453
AIC	–57.772	263.290	442.906
BIC	–27.281	293.241	472.857
N	206	206	206
R-squared	0.235	0.430	0.424

Note: non-standardized regressive coefficients, standard errors in parentheses.

In contrast, the impact of the variable of college graduates appeared not entirely clear, which – however – is in accordance with the above presented findings from the previous studies. While in both examined parliamentary elections (2010 and 2013) a growing share of university educated population decreased the gains of the Pirates, in the EP elections in 2014 the direction of the impact of this variable reversed. We can deliver only two possible working hypotheses regarding this different effect of college students on the support for the Pirates that in the next stage would be advisable to confront with individual data. The first one relates to the possibility that part of the voters of the Pirates who voted for the Pirates in 2010 and 2013 subsequently completed their university education, and this showed in a reversed direction of the variable. Moreover, a

gradual change of power of the coefficients attests to it. While in 2013 the value of coefficient was –0.016, in 2013 it decreased to –0.006, and within a year it moved into the positive value of 0.035. The other possible explanation is linked to the European dimension of the elections, which according to the findings by Linek (2004, p. 28-29) may rather attract university educated population, which to some extent is confirmed when comparing the parliamentary elections in 2002 and the European elections in 2004, when the variable of college students (and also unemployment) had a much stronger influence on the (non)participation in the European elections (cf. Linek, 2004, p. 26-33). Thus, a working hypothesis can be presented that a higher number of college students at the European elections was reflected in the increase of influence of this variable on the gains of the Pirates.

CONCLUSIONS

The paper herein has aimed to analyze the (in)stability of influence of geographic (spatial) patterns of voter support for the Pirates, applying spatially econometric techniques. The conducted analysis of spatial clustering of voter support has shown that, unlike most Czech political parties, electoral gains of the Pirates have long exhibited rather a small regionalization, even though the increase in support for the party in the parliamentary elections in 2013 and the European elections in 2014 showed a slight increase in the clustering of voter support for the Pirates.

The subsequent spatial analysis allowed a more detailed insight into the territorial differentiation of voter support for the Pirates. It was found that rather a lower global measure of spatial autocorrelation (compared to other Czech parties) found its reflection also in the local clusters of voter support for the Pirates. On one hand the number of local clusters of support for the Pirates was not too high, and neither were these clusters too stable.

Over time, however, there occurred a shift in electoral base of the Pirates into a continual cluster of units commencing in Prague and Central Bohemia and then continuing in a northeasterly direction all the way to the north-eastern Bohemia (areas of Liberec, Jablonec, but also Česká Lípa and the related, also limited, parts of the Ústí region). We may thus conclude that the electoral base of the Pirates largely replicates the areas of high support for right-wing parties (to a varying degree) and at the same time the areas characterized by high development potential, while the opposite is true for the support for the Pirates and left-wing parties and KDU-ČSL, where only with a few sporadic exceptions there are no overlaps of high support for the Pirates and these parties.

As in the case of territorial distribution of support for the Pirates, also the factors explaining the success of the party in individual parts of the Czech Republic (with one exception) confirmed a high stability of individual indicators. An important outcome of the analysis is confirmation of independent impact of macro-regions of the Sudetenland and Moravia on the success of the Pirates, which ranked among the strongest predictors of support for the party, in a positive direction in case of the Sudetenland and negative in the case of Moravia.[10]

Besides spatial variables, interregional support for the Pirates was also influenced by other non-spatial characteristics. Here, the logic and the combination of variables was relatively easy to explain and interpret, yet the power of their influence was relatively weak. Successful environment for the Pirates were particularly the units with greater urbanization and a larger number of entrepreneurs, while the negative impact on the gains of the Pirates was exercised by a lack of jobs and older age structure, i.e. the signs that in the socio-economic, or socio-ecological sense define peripheral areas. Ambiguous influence was shown by college graduates; it decreased the gains of the Pirates in the parliamentary elections in 2010 and 2013 (in 2013 more slightly), while in the EP elections in 2014 there occurred a change of direction into a positive relationship. In this case, we have implied two working hypotheses about the unstable effect of the variable of college graduates on the gains of the Pirates. The first one is associated with the possibility that the part of the voters of the Pirates who voted for the Pirates in 2010 and 2013, then completed their university education, and this resulted in a changed direction of the variable. The second possible explanation is linked to the European dimension of the elections that may be more attractive for university educated population, and the growth in college graduates in the ranks of voters of the Pirates reaffirms the reason for the changed direction in the variable of college graduates and its positive impact on the gains of the Pirates.

In general terms, the paper herein has sought to highlight the importance of space, i.e. the influence of spatial distribution of units on the outcomes of analysis. In this approach the impact of an area is not a mere source of the error, or an additive (optional) phenomenon, but instead it is treated as a phenomenon that differently contextualizes variables and relationships in different parts of the space. In this regard, the theme for a future research is the question of whether the relations assumed (and found) by us have identical character in all the parts of the observed space. When examining this influence, it is necessary to work with the concept of extent and nature of spatial nonstationarity of the observed

[10] On the other hand, it can be assumed that the influence of variable of the Sudetenland is currently rather due to a series of other structural factors active in this area than by a separate contextual influence of this variable (Bernard, 2014, p. 138).

phenomena, as commonly used statistical methods fail to reveal how the model works in individual parts of the analyzed territory, or how the significance of individual variables changes within this whole.

Finally, attention of any further research should also be devoted to the aforementioned territorial similarity of voter support for the Pirates and other (mostly) right-wing parties, which shows that the electoral base of the Pirates is located mainly in the areas of traditional support for the right, even though, as we have stated in the introduction, many authors speak of the pirate parties rather as of social-liberal or left-libertarian parties. It would also be interesting to analyze the influence of party ideology, or so-called issue voting on the support for the Pirates. The answers to these questions, however, are beyond the scope of the paper herein and any endeavor to answer them will require working with individual data from sample surveys that are able to more adequately contribute to the explanations of individual behavior of voters.

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