A Geographical analysis of
elections in the V4 in 2010[*]

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Abstract: *This article deals with a geographical analysis of electoral results in the Czech Republic, Hungary, Poland and Slovakia in 2010. Answers are given to questions about the location of electoral support and about how similar parties in different countries obtain their support in similar conditions. The answer to the first question was found through drawing maps of electoral support. The second question was answered with the use of regression analysis with electoral results as a dependent variable and data about society (determined by Rokkan's theory of cleavages) as independent variables.*
Spatial distribution of party support differs between countries and party families. Some similarities are only between the Czech Republic and Slovakia where liberal and conservative parties win in the center and in cities and social democratic parties are the strongest outside cities. Differences are also in the nature of party systems. The Czech and Hungarian party system (in 2010) are based more on economic cleavage: whereas, Slovak and Polish parties are rather based on urban-rural cleavage.

Keywords: *Electoral Results, Electoral Geography, Party System, Visegrad Group, Linear Regression*

Introduction

Year 2010 was very extraordinary for region of Visegrad group because elections were hold in every country. This situation is valuable for comparison between these countries because it is not necessary to take into account time gap between cases of analysis. This article deals with geographical description of results and with comparison of social basement of parties' results.

There are a lot of ways to describe a party system's character but only several ways about explanation of party system's nature (see Evans, Whitefield 2000). In this point of view, Rokkan's theory of cleavages is still a very useful tool for studying relationship between party system and society. Regardless this theory serves to explain the emergency of party systems in Western Europe, it is possible to take some assumptions and use them for description and mainly for explanation of contemporary state of party systems (see Evans 2004: 42–68).

The purpose of this contribution is to bring some information about bases of party system through geographical and ecological analysis of electoral results. The analysis consists of description and explanation of electoral results in selected countries. The objects of analysis are electoral results in countries of Visegrad group in 2010. This means that all conclusions are valid only for selected cases only in certain year 2010. Generalization to wider time period can be inaccurate, because further analysis cannot deal with instantaneous influences and specifics.

The main motive is to compare countries. There is a question whether there are some differences and similarities in support for parties and origins in social stratification of this support in different countries. It is possible to translate this aim into research questions which will be answered in the following text:

> Where is electoral support of parties and candidates located?
> What indicators of social structure are important for certain parties to obtain votes and what are the differences between countries?

The answer to the first question will be found through the interpretation of drawn maps of electoral support. Electoral results by districts (spatial units corresponding with level NUTS 4) will be taken and put into the maps which show the variability of results within countries. Distribution of cases to intervals is based on quantiles[1].

For finding an answer to the second question Rokkan's theory of cleavages will be applied. There are four original cleavages: urban — rural, center — periphery, owners — employees and church — state (Lipset, Rokkan 1967: 9–23). On each of these cleavages some party could exist. These four cleavages are based on the structure of society in 19th century, when parties arose around conflicts between aims of urban a rural population, between owners and employees, between religious and secular

and between inhabitants of the center and periphery. These concrete sides of conflict changed throughout the last century but the bases are probably still the same. Some people are more motivated to vote certain parties than others because they have a different social status (Evans 2004: 42–68).

This means this analysis belongs among sociological models as a kind of electoral behavior theory. Other kinds are psychological models and issue voting. The core of psychological models is a presumption that political preferences are predicted by self-identification of voter with some party. Issue voting means that attitudes of voters to some issue have influence on their political preferences. If a voter has the same opinion about several important issues as some party, he should vote this party.

There is an indispensable danger that the composition of a party's electorate does not adequately represent the ideological profile of party. It depends on the voters' possibilities to make decisions about their vote. Their votes can be influenced by several other factors described by psychological models and by issue voting, for example: sympathies towards a certain candidate, identification with party or agreement with party attitude on some important issue. It is impossible to deal with all of these factors in one article thus the research problem is simplified only to the influence of social stratification on electoral results.

Probably, "the same" parties (or more exactly parties belonging to the same party family) obtain votes from the same social groups. The question of which social groups tend to vote parties and the question about reasons of variability of results will be answered by using regression analysis with electoral results in districts as the dependent variable and data about society — indicators of cleavages — as independent variables.

The most important results of regression are (adjusted) R square and Beta coefficients. Adjusted R square shows how much variability in the dependent variable is explained by variability in independent variables (Field 2009: 206–207) and indicated how good the model is. The Beta coefficient shows the explanatory power of independent variables. Higher numbers mean higher dependence of the dependent variable on certain independent variables. There is no need for inferential statistics because of a calculation with the whole population of regional units (see Soukup, Rabušic 2007).

The comparison will be based on the discussion of results of regression analysis. Focus will be put on information whether the parties from the same family in different countries obtain their support under similar conditions.

Basic Information About Party Systems and Electoral Systems

There are several methodological problems with incomparableness in electoral systems as well as in party systems. The most difficult situation is connected with the Polish presidential elections because it runs off according to rules of a two-round majority system (see Wybory 2010) whereas other elections (Czech Republic, Slovakia) use a proportional system or have at least a proportional part of a mixed system (Hungary). This is a huge limitation for comparison, because the conditions of majority system are fairly different then in proportional system. Especially, there are strong incentives for strategic voting. Above all the position of small parties is totally different, because there is almost no sense to vote for them in majority system (see Abramson, et al. 2010). The presidential election can be linked to ideological issues in different ways than in parliamentary elections. Behavior, as well as the statements of the parties within the presidential election, might be significantly different in comparison with their behavior and statements linked to parliamentary elections.

Regardless of these problems Poland stays a part of this analysis, but it is necessary to be aware of these possible limitations. In the case of Hungary only results from the proportional part will be analyzed.

Questions related to party systems are important because the nature of a party's system creates possibilities for voters. From our perspective the different structure of party systems could result in different bases of electoral support for parties.

The party systems of all countries are relatively close. All party systems are pluralistic in respect of the number of parties and moderate in respect of type according to Sartori's classification. The only exception is the Czech system, which is assumed to be semi-polarized. Individual systems differ mainly in the number of relevant parties. There are four parties in Poland and Hungary, five parties in the Czech Republic and six parties in Slovakia. In the case of Poland the number of parties is given by results of the general elections.

For a comparative aim is very useful to put parties into groups containing the most similar cases. For this purpose Bayme's concept of families of political parties is suitable (Bayme 1985) or Lewis's modification for Central-Eastern Europe (Lewis 2000). There are some critical voices about ineligibility of both classifications in a post-communist context (see Fiala, Strmiska 2004: 13–25). They criticize static, genetic and West-centric nature of the original theory. However they do not offer an alternative solution. Thus parties will be classified according to Bayme's theory with addition of an "others" category (see Table 1).

Table 1: Parties According to Bayme's Classification in Countries of the Visegrad Group in 2010

	Communists	Social-Democrats	Green	Liberal	Conservative	Christian-Dem	Extreme Right	Other	Minorities
Czech Rep.	KSCM	CSSD		TOP09	ODS			VV	
Hungary		MSZP	LMP		Fidesz		Jobbik		
Poland		SDL		PO	PiS	PSL			
Slovakia		Smer		SaS	SDKÚ	KDH	SNS		Híd, MDK

Source: Czech Statistical Office: Volby.cz, Statistical Office of Slovakian Republic: Voľby do NR SR 2010, National Election Office: 2010 Parliamentary elections 2010, Wybory 2009, Strmiska et al. (2005)

There are about 20 relevant parties according Sartori's rules in at least 9 categories. But only two party families have their member in every country. These families are Social Democrats and Conservatives. Also liberal parties will be objects of analysis, because it is very difficult to classify Central European parties to these categories. Lewis (2000) (in a lot of points not useful classification) suggests a common category for conservative and liberal parties. There is another argument why these parties cannot be missed in this analysis. It is nearly impossible to be sure whether these parties, especially TOP 09, are rather liberal or conservative and whether they are more liberal than parties classified as "conservative." For these reasons results of TOP 09, PO and SaS will be analyzed, although there is no member of this family in Hungary.

The Social Democratic Party won the elections in Slovakia and the Czech Republic and was the second party in Hungary and a candidate of Social Democrats was the third in polish presidential elections. Fidesz won elections in Hungary; whereas' all other conservative parties were the second in their electoral competitions. A candidate of liberal PO became the new president of Poland. Both SaS and TOP 09 were the third party in Slovakian Czech general elections respectively. In all countries these three parties won more than 50 % of votes. The smallest share obtained in the Czech Republic, on the contrary the largest in Poland with more than 90 %. Because this analysis deals with important sums of votes, its results can be relevant (see Table 2).

Table 2: Results of General Elections in the Czech Republic, Hungary and Slovakia and Presidential Elections in Poland in 2010

country	Social democrats	% of votes	Conservatives	% of votes	Liberals	% of votes	others
Czech rep.	ČSSD	22,08	ODS	20,22	TOP09	16,7	41
Slovakia	Smer	34,79	SDKÚ	15,42	SaS	12,14	37,65
Hungary	MSZP	19,29	Fidesz	52,72			27,99
Poland	Napieralski	13,68	Kaczyński	36,46	Komorowski	41,54	8,32

Source: Czech Statistical Office: Volby.cz, Statistical Office of Slovakian Republic: Voľby do NR SR 2010, ISPO: CODER, Wybory 2010

Data

The data for this analysis are from the two sources. The first one is electoral results from electoral commissions of individual countries and the second one is census data from 2001.

Independent variables are selected as indicators of cleavages according Rokkan's theory. Proportion of self-employed and unemployment rate are indicators of economic cleavage. These variables describe a traditional sense of this cleavage — distinction between owners and employers, although there are some innovations in the way how to define this cleavage, for example conflict is assumed between employers in public and private sector (Evans 2004: 48). Unemployment rate is a variable which described economic conditions in a certain place.

The characteristics of rural areas are the proportion of workers in agriculture and urbanization rate. The proportion of agricultural workers is given as a fraction of farmers to all economically active in the population. Urbanization rate is computed as a proportion of population in municipalities and cities with more than 5000 of total population. There is a certain problem with the different specification of municipalities in different countries. Hungarian and Polish municipalities are much bigger on average than municipalities in the Czech Republic and Slovakia. But it does not matter, because municipalities over 5000 have the same functions in all countries.

Cleavage center periphery can have a lot of meanings. This article uses ethnic division of society as the division between the center and periphery although it can be defined in economic, geographical or social terms. It is defined by the proportion of major nationality of state in the whole population. Cleavage between church and state is defined by proportion of persons with Roman Catholic denomination.

All independent variables have some relationship with some cleavage. Proportion of self-employed and unemployment rate are indicators of economic (originally

owners-employees) cleavage. Assumed relationship is that regions with a higher proportion of self-employed and lower unemployment rate are connected with higher support for liberal parties (in themes of economy) and with lower support for social democrats. The urban-rural cleavage is defined by the proportion of agricultural workers and rate of urbanization. All selected parties should be based on economic cleavage so there is a theoretical assumption about no relationship between urbanization and party support and between party support and indicators of cleavages center — periphery (indicated by proportion of ethnic minorities) and church — state (indicated by proportion of Roman Catholics).

All the data are connected with regional units of level NUTS 4 with the exception of Hungary. These units are called *ORP* [2] in the Czech Republic, *okres* in Slovakia and *powiat* in Poland. Results of Hungarian general elections were available only for electoral districts, whereas census data were available for different census regions. Data for analysis was calculated for overlapping areas.

Conservative Parties

The first map represents the electoral results of conservative parties. There is not one central tendency of spatial localization of party support. The Czech ODS and Slovak SDKU are more successful in central areas and in districts with cities, before all around capitals Prague and Bratislava. The situation in Poland and Hungary is inversed. Both Fidesz and PiS, namely its candidate Kaczyńsky, obtained more votes in rather peripheral districts and outside cities. In the case of Kaczyńsky, distinction between traditional and modern Poland (see Wade 1995: 422) is obvious (see Map 1).
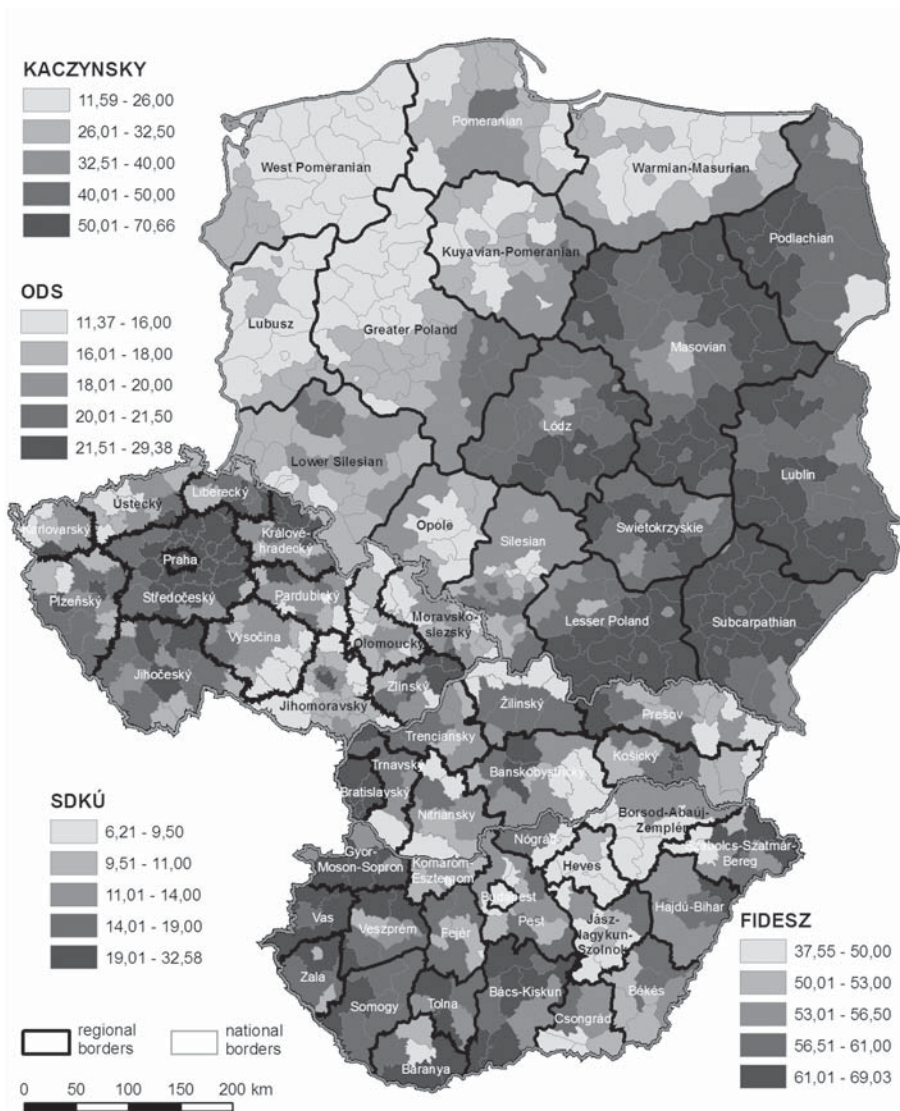
There are some significant differences in results of the regression model for different parties of the conservative family. In all countries a regression model can explain a high proportion of variability. Only the Hungarian Conservative Party, Fidesz, is an exception, the model can explain only 34 % of its variability whereas it can explain from 50 to 60 % of variability of other parties' results (see Tab 3). It means that Fidesz is less dependent on conditions described by independent variables than other conservative parties.

More differences can be found in view of values of beta coefficients, which mean that there is different relationship between intensity of party support and propor-

tions of social groups. All parties won more votes in regions with low unemployment but in other characteristics they differ. ODS obtained higher support in regions with higher proportion of self-employed whereas Fidesz and Kaczynsky lost here. On the contrary the ODS lost support in rural areas with a higher proportion of agricultural workers whereas it is a good condition for Fidesz and especially for Kaczynsky. Only one party profits from high urbanization: SDKU (see Tab 3). Proportion of minorities (ethnic) and Catholics is not an important variable for all of these parties. It is possible to interpret these results in a way that parties are not based on cleavages center — periphery and church — state, but mainly on economic cleavage (ODS, Fidesz and SDKU) and urban — rural (Kaczyńsky, SDKU).

These relationships between proportions of social groups and electoral result do not mean that people from these groups really vote for a related party. The real relationship can be the opposite to what leads to some kind of ecological mistake (see Freedman 1999: 1). In an effort to avoid this problem, the meaning of independent variables is interpreted as indicators that described the social conditions of regions.

Table 3: Results of Regression Analysis for Conservative Parties

|	ODS	Fidesz	Kazcynsky	SDKU
Adjusted R Square	0.53	0.34	0.50	0.62
Ethnic	0.08	-0.14	0.25	0.11
Catholics	-0.13	-0.15	0.09	-0.17
Self-employed	0.40	-0.22	-0.31	-0.08
Urbanization	-0.11	-0.28	-0.12	0.50
Agriculture	-0.26	0.24	0.63	0.03
Unemployment	-0.43	-0.47	-0.34	-0.37

Source: Calculations by author

Liberal Parties

A family of liberal parties has its members only in the Czech Republic (TOP 09), Slovakia (SaS) and in Poland (PO). Distribution of support for the Czech TOP 09 is very similar to the distribution of support for the ODS, but it is higher in central districts of regions. Almost the same situation is in the case of support the SaS, which is very similar to support for the SDKÚ. On the contrary, support for Komorowski — candidate of the PO — in Poland is totally opposite to support for Kaczyńsky. It corresponds with the division of Poland mentioned above. Komorowski won more

votes in cities and in the North-Western part of Poland, whereas Kazcyńsky was more successful in districts outside cities in the South-Eastern part (see Map 2).

Map 2: Electoral Results of Conservative Parties
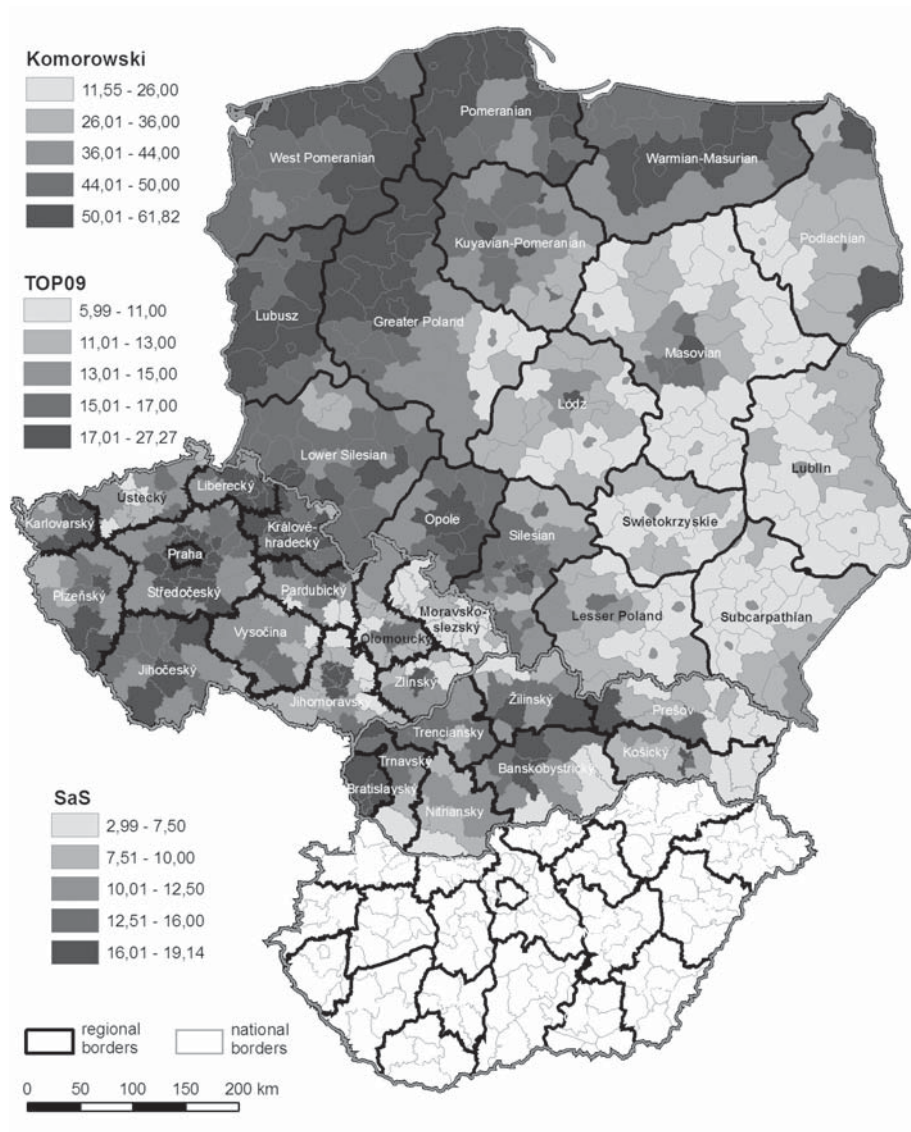
Results for the segment of liberal parties are a little bit different then for the group of conservative parties. Total results given by adjusted R square are almost the same in each case — approximately 0.65 (see Tab 4). However different variables have different strengths in models for different countries.

Table 4: Results of Regression Analysis for Liberal Parties

|	TOP 09	Komorowski	SAS
Adjusted R Square	0.65	0.64	0.63
Ethnic	0.01	-0.27	0.41
Catholics	-0.20	-0.11	-0.15
Self-employed	0.52	0.28	-0.13
Urbanization	0.01	0.12	0.37
Agriculture	-0.19	-0.74	0.13
Unemployment	-0.61	0.29	-0.36

Source: Calculations by author

The Czech Conservative Party, TOP 09, has similar results as the ODS, yet it is more dependent on a high proportion of self-employed and on a low unemployment rate. Also results for the SAS are very similar to the results for the SDKU. The SAS is more a "Slovakian" party because its support is more dependent on a proportion of Slovaks. The SaS seems to be more nationalistic than the liberal party according to values of Beta coefficient. These results are influenced by the composition of the Slovakian party system where Most-Híd is a concurrent party to the SaS and it had strong support in areas with districts with high proportion of the Hungarian minority (Voľby do NR SR 2010). Values of Beta coefficients for Komorowski are the inverse of these for Kaczynsky, he won in less agricultural areas. Only TOP 09 is strongly based on economic cleavage, whereas Komorovski and the SaS are involved only partially. The PO is a more urban party and the SaS is a party of the center. Again, no one party is based on the cleavage church — state.

Social-Democratic Parties

As well as right-wing parties, social democratic parties do not have the same pattern of support in all countries. Czech and Slovak Social democratic parties are strong in districts without big cities across the whole country. The support of Napieralsky is similar. Polish social democrats, the SLD obtain more votes in rather rural districts in the North-Western part of Poland. The Hungarian MSZP has the opposite pattern of electoral support, it wins more votes in Budapest and other cities (see Map 3).

Map 3: Electoral Results of Social-Democratic Parties
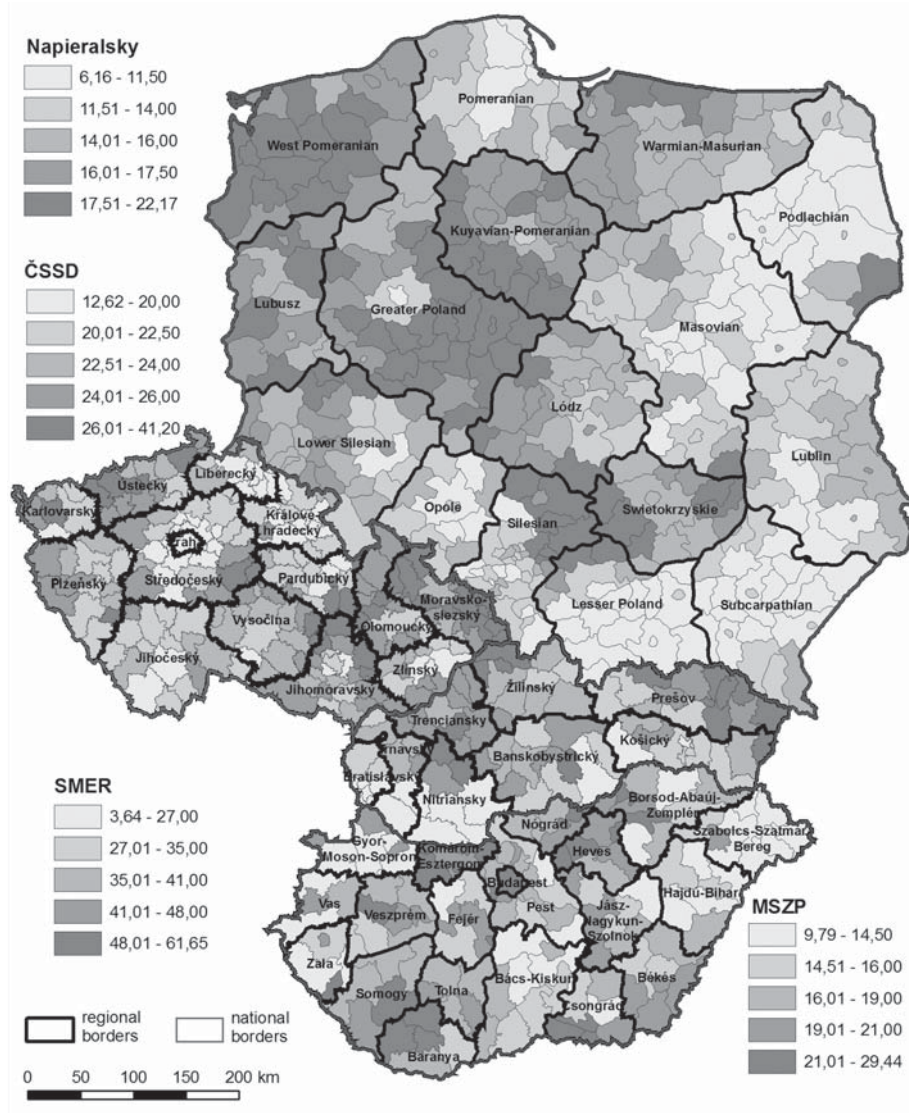
Among social democrat parties, the exception of Poland is evident. The model can explain only 10 % of variability of Napieralski's results whereas it can explain 40 % for MSZMP, 50 % for SMER and 60 % for the CSSD (see Table 5). This means that there is almost no relationship between the independent variables and Napieralski's support, more precisely that all independent variables together have almost no influence on support for candidates of social democrats.

Table 5: Results of Regression Analysis for Liberal Parties

	CSSD	MSZMP	Napieralski	Směr
Adjusted R Square	0.62	0.38	0.11	0.53
Ethnic	-0.29	0.01	0.05	0.68
Catholics	0.09	0.41	0.02	-0.16
Self-employed	-0.38	0.26	0.16	0.12
Urbanization	0.03	0.36	0.05	-0.36
Agriculture	0.05	-0.18	-0.11	-0.15
Unemployment	0.34	0.20	0.35	0.19

Source: Calculations by author

All social democratic parties (including Napieralski) are dependent on unemployment. Where the unemployment rate is higher than in other regions there is higher support for Social Democrats. Other variables have different effects in different countries. The Hungarian Socialist Party is more successful in regions with a high proportion of Roman Catholics and in urban areas, whereas the Slovak SMER has higher support in rural areas and in more ethnically homogenous districts. On the contrary the Czech Social Democrat Party has a converse relationship with ethnic structure when it takes more votes in areas with a higher proportion of ethnic minorities. The CSSD is also more connected with "economic" cleavage whenever it obtains support in areas with a small proportion of self-employed. Results for the MSZMP are very strange, they are nearly opposite to results for other social democratic parties and are similar rather to liberal parties especially in Poland.

Conclusion

Regardless of the fact that there were a few limitations caused by data and methods, the questions mentioned in the introduction were answered and some interesting results were found.

Spatial distribution of party support differs between countries and party families. Some similarities are only between The Czech Republic and Slovakia where liberal and conservative parties win in the centre and in cities and social democratic parties are the strongest outside cities. In Poland (as well as in Hungary) conservatives are more based in rural areas whereas liberal — and in the case of Hungary, social-democratic parties are more successful in cities.

Results of analysis indicate different bases of party systems in countries of Visegrad group. Only parties with the highest share of votes in one election are analyzed, thus it is not possible to formulate general conclusions about the nature of party systems but it does not mean that further conclusions are not relevant. Differences in the base of the most important parties of selected countries were found.

The Czech party system is more based on cleavage owners — employers while Slovak and Polish parties are rather based on cleavage urban-rural. In the case of Poland important variable is the rurality of regions. Kazcynsky won in regions with high proportion of agricultural workers whereas Komorowski won in areas without them. Distinctions between Hungarian main parties are given by relationship with unemployment, which shows influence of economical cleavage, but religion and urbanization are also significant. A possible answer can be that Fidesz and MSZP represents not only sides of economical conflict but also sides of other conflicts, but this is only a hypothesis which needs more research.

Notes

[1] The same number of cases is distributed to every interval by this method. It is a useful tool to study differences in spatial distribution.
[2] Municipality with extended powers.
[3] Base map: diva-gis.org (Poland, Slovakia), ArcCR (Czech Republic) and own edits on base of diva-gis.org (Hungary).
Own visualization.

References

Electoral results

National Election Office (2010) 'Parliamentary elections 2010'. Available at: http://www.valasztas.hu/en/parval2010/index.html (Accessed on 30 November 2010).

ISPO 'CODER'. Available at: http://ispo.fss.muni.cz/modules/elections/index.php?act=form&page=3&dir=next&election_order=&year=&period=period_last (Accessed on 30 November 2010).

ČSÚ (2010) 'Volby do Poslanecké sněmovny Parlamentu České republiky konané ve dnech 28. 05.–29. 05. 2010'. Available at: http://www.volby.cz/pls/ps2010/ps (Accessed on 30 November 2010).

Štatistický úrad Slovenskej republiky 'Voľby do NR SR 2010'. Available at: http://app.statistics.sk/nrsr_2010/menu/indexD.jsp?lang=sk (Accessed on 30 November 2010).

Krajowe biuro wyborcze 'Wybory Prezydenta Rzeczypospolitej Polskiej 2010'. Available at: http://prezydent2010.pkw.gov.pl/PZT1/PL/WYN/W/index.htm (Accessed on 30 November 2010).

Data

Štatistický úrad Slovenskej republiky 'RegDat. Databáza regionalnej štatistiky'. Available at: http://px-web. statistics.sk/PXWebSlovak/index.htm (Accessed on 30 November 2010).

ČSÚ 'Regiony, města, obce'. Available at: http://czso.cz/csu/redakce.nsf/i/regiony_mesta_obce_souhrn (Accessed on 30 November 2010).

Główny Urząd Statystyczny 'Statystyka Regionalna'. Available at: http://www.stat.gov.pl/gus/5840_5956_PLK_ HTML.htm (Accessed on 30 November 2010).

Központi Statisztikai Hivatal 'Tájékoztatási adatbázis'. Available at: http://statinfo.ksh.hu/Statinfo/themeSelect or.jsp (Accessed on 30 November 2010).

Diva GIS 'Download data by country'. Available at http://www.diva-gis.org/gdata (Accessed on 30 November 2010).

ESRI: ArcCR500.

Literature

Abramson, Paul R., et al (2010) 'Comparing Strategic Voting under FPTP and PR'. Available at http://works. bepress.com/cgi/viewcontent.cgi?article=1007&context=renan (Accessed on 30 November 2010).

Evans, Geoffrey and Whitefield, Stephen (2000) '*Explaining the formation of electoral cleavages in post–communist democracies*' in Klingemann, Hans-Dieter, Mochman, Ekkehard and Newton, Kenneth (eds) '*Elections in Central and Eastern Europe: The First Wave*' Berlin: Sigma.

Evans, Jocelyn, A. J. (2004) *Voters* & *Voting: An Introduction.* London: Sage Publications.

Fiala, Petr and Strmiska, Maxmilián (2004) 'Ideově-politické rodiny a politické strany v postkomunistických zemích střední a východní Evropy', in Fiala, Petr et al. (eds) *Politické strany ve střední a východní Evropě*. Brno: Masarykova univerzita.

Field, Andy (2009) *Discovering Statistics Using SPSS (Introducing Statistical Methods)*. London: Sage Publications.

Freedman, David A. (1999) 'Ecological Inference and the Ecological Fallacy'. Available at http://www.stanford. edu/class/ed260/freedman549.pdf (Accessed on 30 November 2010).

Hendl, Jan (2006) *Přehled statistických metod zpracování dat. Analýza a metaanalýza dat*. Praha: Portál.

Lewis, Paul G. (2000) *Political parties in post-communist eastern Europe*. London: Routlege.

Lipset, Saymour and Rokkan, Stein (1967) *Party systems and voter alignments: cross-national perspectives*. New York: Free press.

Soukup, Petr and Rabušic, Ladislav (2007) 'Několik poznámek k jedné obsesi českých sociálních věd, statistické významnosti', *Sociologický časopis* 43, 2: 379–395.

Strmiska, Maxmilián et al. (2005) *Politické strany moderní Evropy.* Praha: Portál.

Von Beyme, Klaus (1985) *Political Parties in Western Democracies.* Aldershot: Gower Press.

Wade, Larry L. et al. (1995) 'Searching for Voting Patterns in Post-communist Poland's Sejm Elections', *Communist and Post-communist Studies* 28, 4: 411–425.