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To my loved ones

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Introduction

Anthony Downs in his work "An Economic Theory of Democracy" introduced a whole new understanding of political processes. This seminal book opened a brand new path for public choice analysis. Using methods traditional to economics, he has shown that political choices can be analyzed in a similar way as rational consumers' choices using simple microeconomic axioms. The rational voter theory has become an useful tool in political economy.

This thesis is a compilation of four papers that analyze diverse aspects of the rational voter theory and spatial models of political competition. Three of them deal with a spatial model of parliamentary elections, whereas in the fourth one we implement the rational voter theory to analyze the impact of direct democracy on fiscal decisions.

In Chapter 1 we present a comprehensive analysis of the Polish parliamentary elections in 2007 and the subsequent formation of the coalitional government and its policy choice. On the basis of equilibrium predictions of a model of probabilistic voting with non-spatial characteristics of parties in the utility of voters, we find that for two parties the Downsian behavior is not likely. Moreover, on the basis of the rational voter theory we conclude that abstentions had an unequal effect on the election results of particular parties. The second part of the empirical study deals with the coalitional behavior, and again we non-Downsian behavior

of certain parties. Notions such as the uncovered set and the Schattschneider set are analyzed in comparison with the pension system reform conducted in 2007–2009. It turns out that theoretical predictions made with the use of cooperative game theoretical concepts correspond well to the actual policy choice. The main conclusion of this chapter is that the rational voter theory and the spatial model in general are very useful in both predicting the positions of parties in the political space, the effect of abstentions, the post-electoral coalition formation as well as the actual policy choice of a governing coalition.

In Chapter 2 we show how the choice of methodology for the estimation of party positions impacts the conclusions about equilibrium positions of parties in a spatial model. We use the same set of voters' ideal points and two different methodologies of party positions estimation. We show that, depending on the choice of the methodology, we should observe either divergence or convergence to the mean. We conclude that, in order to provide policy predictions, a researcher must choose carefully the method of implementation of the theory to actual data.

In Chapter 3 we test the impact of campaign finance regulations, introduced to decrease the influence of special interest groups on parties' platforms. We base our predictions on the spatial competition model with non-spatial characteristics of parties and use a cross-country sample of 47 countries. We find that public funding of parties leads to divergence in platforms from the mean voter. Moreover, ceilings on individual contributions might cause platforms to converge. These effects are caused by the impact of differences in the non-spatial characteristics among the parties, which are affected by the way these are being financed. We also find unexpected divergence related to a ban on corporate donations and the public disclosure of income statements. These results are based on an equilibrium theory and do not allow us to make unexceptional policy recom-

mentations. Nevertheless, are a first step towards understanding the mechanism of how financing schemes may affect platforms of parties.

The final chapter contains an analysis of local referendum on self-imposed taxation in Poland. In this chapter we use the rational voter theory and its further developments by Romer and Rosenthal (1978). The political economy literature that deals with directly-democratic decision-making typically finds that it leads to a more efficient fiscal policy as compared with the case in which decisions are made by a centralized authority. We provide a detailed description of a specific direct democracy institution, which is a referendum on self-imposed taxation in Poland. We provide an example of how the specifics of this legal institution may lead to undesired results, in particular a lack of improvement in fiscal decision-making. We find that, on the base of the high costs of initiative and the low access to information on the side of the public, such a referendum does not lead to increased voter participation in local decision-making. Moreover, we find that due to the high costs of initiative, local authorities are given a *de facto* monopoly power over the agenda-setting. As a result, the considered referendum does not lead to a more efficient provision of public service, but serves as a mean of budget expansion for bureaucrats.

Chapter 1

Spatial Analysis of the Polish Parliament 2007-2010

1.1 Introduction

Poland is a very young modern democracy. The first partially free election took place in 1989, when just 35% of the seats in the Lower House and all the seats in the Senate were assured to be freely elected. The first entirely free election was conducted in 1991. Up until 2007 only 7 parliamentary elections have taken place. Although, historical events still play a major role in determining the shape of the political competition and its differing ideologies, recent literature on has shown that Central European party systems develop similarly to Western Europe and are in many aspects such as volatility or longevity of governments comparable or even better (see, e.g. Kubat (2010)). The issue of comparison of Central European democracies with more mature democratic European countries has recently gained much attention from political science scholars.

Aim of this paper is to verify whether it is possible to apply modern economic

techniques to the case of Poland, which seems still be developing in terms of legal rules concerning election as well as in terms of the actual shape of the political scene (see Kubat (2006) for a further discussion of electoral reforms in Poland). In particular we want to explore if Poland's political structures - which are widely derived from other countries and which use imported constitutional solutions - would develop in a manner similar to other countries' historical development. Moreover, it is often argued that Polish politicians are not yet 'professional', as they don't use modern public relations research and furthermore a political culture in general is not yet fully established. Use of a Downsian approach can to some extent verify this hypothesis.

A second motivation for this research was the fact that there is little literature on this topic. Known applications of the spatial model include Great Britain, the Netherlands, Israel and Russia. A recent working paper of Schofield et al. (2010a) introduced spatial approach for the case of Poland. Authors present results of MNL models with valence applied to elections in 1997, 2001 and 2005. There are, however significant differences between their and our approach, besides the obvious fact the we analyze elections in 2007, rather than the previous ones. First of all, Schofield et al. (2010a) do not directly evaluate party positions, but use the average of the positions of the voters for each party. This fact has a major consequences on the estimated parameters, to which we shall return later on. Second of all, we provide a much deeper analysis of strategic behavior of parties, which is an important factor for LiD and PSL parties on a basis of post-electoral behavior and particularly important effect of cohabitation. Third of all, we also provide a formal argumentation for the fact that results of only a sample estimation of vote shares are insufficient for predicting electoral results in Poland, because of the unequal effect of abstentions for each of the parties.

A rare example of game-theoretical approach to modeling coalitional politics in Poland is Sosnowska (2000), which analyzes pre-election polls before 1997 parliamentary election and for each poll uses Shapley values and modified Shapley values to predict post-electoral coalition formation.

The aim of this paper is to begin to fill this gap and apply contemporary public choice research to an interesting new case. The goal of this work is to prove whether the theory of spatial competition is suitable for explaining parliamentary elections in Poland. Specifically, two major spatial competition issues and some auxiliary hypotheses are analyzed. First, we explore whether a multi-party probabilistic model can be used to model the Polish political scene, in particular to model the results of the 2007 election. We evaluate a number of models of spatial competition: a pure probabilistic model, a one, in which we additionally control for social characteristics of voters and two valence models. First we test how many spatial dimensions characterize the political competition. Two dimensions are shown to be sufficient to model Poland's political scene: a one which can be associated with economic policy and the second that captures religious concerns and world-view. The pure probabilistic model turns out to be superior in Poland's case compared to the one in which we add voters characteristics. However, neither of these models takes into account the non-spatial characteristics of the competing parties and it is argued that for at least some candidates non-spatial characteristics should be further researched. That is why we estimate spatial models with valence. On a basis of it, it is possible to check, with the use of findings of Schofield (2007) whether parties are in equilibrium positions. We conclude this section with finding that for one of the analyzed parties, namely LiD non-Downsian behavior is most probable.

In the second part of the study we address the issue of abstentions, which

are shown to play a major role in explaining discrepancy between theoretical prediction from spatial models estimated on a basis of only a sample of voters and actual vote shares of parties obtained in 2007 election. We test diverse hypothesis on reasons for abstentions and their unequal effect on actual vote shares of parties, to find support that low turnout indeed had a major influence on election results.

The third part of the empirical study concentrates on the post-election behavior of the parties, as well as on the coalitional bargaining that took place and its impact on the post-election positioning using various cooperative game-theoretical concepts. Post-election behavior is also illustrated with a case study of the pension system reform conducted in 2007-2009. By this we show that simple cooperative game-theory instruments reasonably well correspond with actually observed political behavior. It is predicted, both on a basis of pre-election and post-election policy choices that for some parties, strategic behavior may play a strong role in choosing their manifested ideal point, whereas for the other parties the pure Downsian approach adequately explains their observed position.

Section 1.2 is dedicated to empirical analysis of pre-election competition on a basis of Downsian models. In Section 1.3 we predict equilibrium behavior of parties with the use of a spatial valence model. In Section 1.4 we address the issue of unequal effect of abstentions on electoral results. Sections 1.5 and 1.6 comprise analysis of post-electoral behavior of parties exemplified with the case study of the pension system reform. Section 1.7, followed by appendices conclude the paper.

1.2 Models of Pre-Election Competition

1.2.1 Data

The data were obtained from the Public Opinion Research Center (CBOS - Centrum Badania Opinii Społecznej). The research was conducted in 2007 and includes 1385 individual observations. After excluding observations lacking data, and those for which respondents did not plan to vote in the election, the sample was reduced to 579 observations. Respondents were asked questions about their economic and political concerns, electoral preferences and their own characteristics. To map the ideological preferences of the voters, seven questions were asked, each eliciting an opinion about an important social or economic matter. Respondents were asked to place their answers on a scale between 1 and 7. The questions are reported in Table 1.1.

Answers to the above questions were then rescaled in such a way that they lie within a $(-1; 1)$ scale. On a basis of the answers, a factor analysis was conducted to find the main factors that lie behind the given answers. As expected there was a strong socio-political factor that describes the attitude of the responder towards the church. Table 1.2 presents the loadings of each answer.

It may be noted that the first factor may be associated with an economic state control vs. economic liberalism scale, with a high impact of responses to questions B, E, F and G. The second factor describes respondents world-view as conservative or liberal. In the second factor, we find a particularly high impact of responses to questions C and H, questions that described the views of the respondent on the role of church and abortion. Apart from the economic dimension, these world-view questions turned out to be, as predicted, the main

Table 1.1: Questions about political and economic issues

Question	Answers
A	1) Crime should be fought toughly, even if it hinders civil rights 7) Crime should be fought in a way that does not hinder civil rights
B	1) Unemployment is harmful to the economy and should be stopped 7) A little unemployment can be profitable for the economy
C	1) The Catholic Church should be separate from the state and should not influence politics 7) The Catholic Church should have a major influence on politics
D	1) Public figures should provide statements as to whether they collaborated with the People's Republic of Poland security apparatus 7) Public figures should not have to provide statements as to whether they collaborated with the People's Republic of Poland security apparatus
E	1) Only select public companies should be privatized 7) As many as possible public companies should be quickly privatized
F	1) The state should provide high levels of public services, such as health care and education 7) Citizens should be responsible for providing themselves with education, healthcare etc.
G	1) Richer people should pay higher fraction of their income in taxes 7) Everyone should pay the same tax rate, regardless of income.
H	1) Abortion should be absolutely forbidden 7) Abortion should be allowed without restriction.
I	1) Poland should aim towards the highest possible degree of integration into the European Union 7) Poland should keep a high degree of autonomy within the European Union

Table 1.2: Loadings of answers

	Factor 1	Factor 2
A	0.252	0.225
B	0.447	–
C	0.107	-0.614
D	0.223	0.245
E	0.409	–
F	0.579	–
G	0.478	–
H	0.224	0.459
I	-0.291	–
SS loadings	1.105	0.799
Proportion Var	0.123	0.089
Cumulative Var	0.123	0.212
χ^2 – Test	p-value=0.0517	

Table 1.3: Impact of factors on left/right self-perception.

Left/Right	Coef.	SE	t	$P > t $	95 % Conf. Interval
Factor 1**	-.358	.158	-2.26	0.024	-.669 -.047
Factor 2**	-.345	.149	-2.31	0.022	-.639 -.051
Const.***	4.745	.206	23.05	0.000	4.34 5.15
$Prob > F = 0.0084$					
Adjusted $R^2 = 0.016$					

ideological issue and the deciding factor in shaping Polish politics. χ^2 test, which null hypothesis is that two factors are enough to describe major part, shows that is hypothesis cannot be rejected. We assume thus in further study that the issue space is spanned in two dimensions. For a deeper analysis of the latter statement a regression was conducted which investigated the impact of each ideological factor on how the voters place their views on the left vs. right scale (1 denoting left-wing, 7 . right-wing outlook).

Both factors have highly significant impacts on the respondents' self-perception.

Liberal economic views cause voters to place themselves as left-wing. Similarly, approval of separating church from state, and support for abortion availability places respondents on the left side of the political spectrum.

1.2.2 Political Parties and Voters

In the 2007 election, three parties and one parliamentary group were able to gain seats in the parliament. The names, abbreviations, votes obtained and seats obtained are presented in the table 1.4¹. This paper does not include the German Minority Party which has obtained one or two seats in the parliament since 1991, and which obtains the great majority of their votes in the south-western part of Poland. As the national minority representative it is excluded from having to pass the threshold. Traditionally, the German Minority supports the government regardless of its political stance.

Table 1.4: Parties in the parliament

Name	Abbreviation	Votes in %	Seats
Platforma Obywatelska (The Civic Platform)	PO	41.51	209
Polskie Stronnictwo Ludowe (Polish People's Party)	PSL	8.91	31
Prawo i Sprawiedliwość (Law and Justice)	PIS	32.11	166
Lewica i Demokraci (Left and Democrats)	LiD	13.15	53
<i>Mniejszość Niemiecka</i> (<i>German Minority</i>)	<i>MN</i>	0.20	1

How to evaluate party positions is an important methodological concern for

¹Lewica i Demokraci consists of four social-democratic parties: Democratic Left Alliance (SLD), Social Democracy of Poland (SDPL), Labour Union (UP) and the Democratic Party (SD)

political studies. We decided to directly survey party representatives, for we believe they are experts with regards to their own party's stances. As mentioned earlier, we used the same set of questions on political and economic issues as was presented to the voters. In cases where no answer was given, the missing values were estimated on the basis of parties' manifestos, by directly comparing sentences in them with our questionnaire.

What is even more important, the actual policy choices of parties can be misunderstood by voters, and the perception of positions may differ from the actual ones. Since the perception is what voters will take into account in their electoral choices this might lead to a bias in the results. There is no reason to believe, that this bias should be in a particular direction in case of the analyzed parties. We therefore assume that, even if there exists a misperception of voters' assessment of parties' positions, it is random and on average should not affect the results as it will be fully captured by the error term in the probabilistic model.

This work only includes parties that were able to receive seats in Sejm in the election of 2007. Table 1.5 presents ideological positions of parties.

Table 1.5: Parties' positions

	PO	PSL	PIS	LiD
A	7	7	1	7
B	5	2	1	3
C	1	2	7	1
D	2	2	1	1
E	2	3	2	1
F	3	1	1	1
G	7	1	1	1
H	3	2	1	7
I	1	2	7	1

We used factors' loadings obtained from the study of voters' positions to

transform these, such that they are placed in the same issue space. These will be used in the construction of the spatial model in the next section.

Density and Spatial Placement of Parties

On a basis of factor loadings, ideological scores were obtained for each voter. These were combined to give an ideal point for each voter in two policy dimensions. We call the first dimension "Economic" and the second "Religious". The findings of our factor analysis are in line with less formal political science research on the two dimensional space of competition for Poland, as presented e.g. in Markowski (2010). The lower value of the economic dimension indicates support for a higher level of interventionism in the economy. Low levels along the religious dimension suggest support for secularism, whereas high values mean support for a high degree of involvement for Catholic values in public life. Based on location of ideal points, in order to visualize positions of electors we estimated a two-dimensional kernel density of voters' positions, with an axis-aligned bivariate normal kernel. The graph illustrating the estimated density for the two factors is presented in Figure 1.1.

The majority of voters are concentrated in the quarter of the ideological space representing left-wing economic views, therefore supporting high state control over the economy and a conservative world-view. The latter result suggests that Catholic values are widely held, and that voters expect the church to play a strong role in political life. At first glance, parties' positions presented in Table 1.5 suggest that parties fit into these popular opinions quite well. The scorings for each party serve as the ideal points for parties' positions and are used in further analysis. Figure 1.2 presents parties' positions estimated on a basis of factor analysis in comparison with the density of voters' positions.

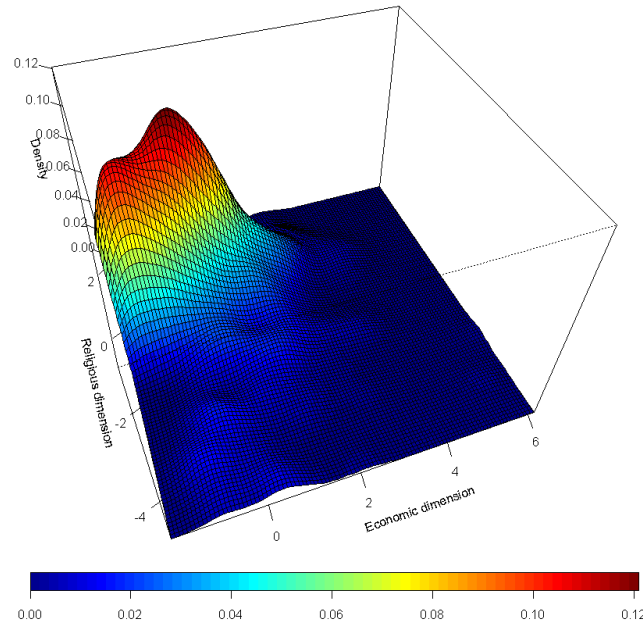


Figure 1.1: Density of voters' positions

From Figure 1.2 it can be at the first glance observed that all the parties are quite well positioned in the ideological space, and as expected all, except for LiD are in support for Catholic church values. The peak of the distribution is occupied by the PSL, which places itself in the center of the economic dimension. The party on the left of the religiosity scale is the LiD, whereas the other three competitors are placed in the more conservative part of this ideological space. The LiD need not compete with other parties for the religious left-wing oriented voters and should capture the votes of all electors located at the bottom-left corner of the distribution. The other three parties are almost collinear along the religiosity scale, and they compete primarily in one dimension – the economic one.

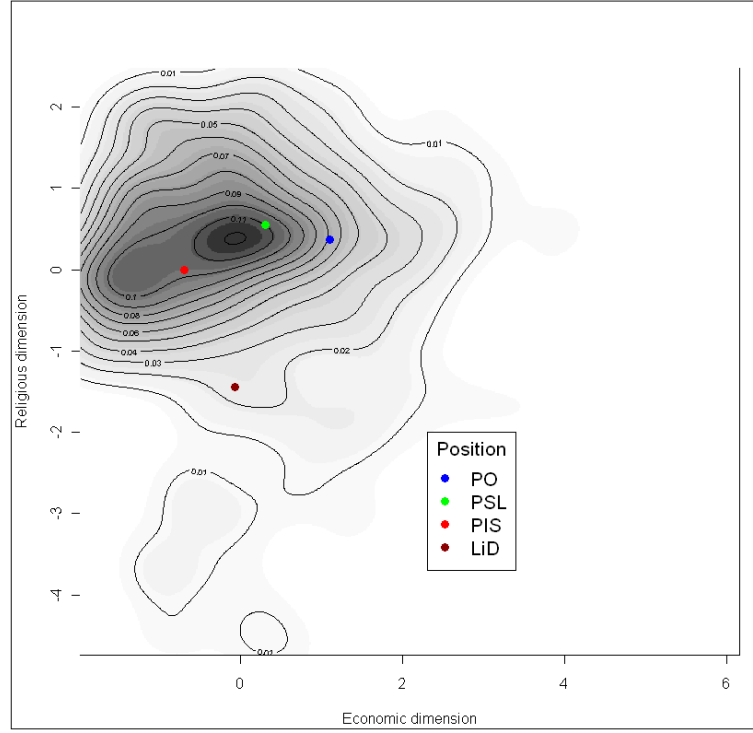


Figure 1.2: Voters' and parties' positions

1.2.3 Models Based on Spatial Theory

The profile of voters' ideal points $(x_i)_{i \in N}$ and the profile of party positions $(\phi_j)_{j \in K}$ are combined to obtain the distance (in this case a Euclidean norm was calculated) of each voter from every party, producing an array $(\delta_{ij})_{i \in N}^{j \in K}$. The voting intentions of the electors are represented with a matrix $(y_{ij})_N^K$ in which $y_{ij} = 1$ if voter i voted for party j in the 2007 election and 0 otherwise. Probability matrix representing probability that i votes for j must be calculated (the realization of which is obtained by maximum likelihood estimation).

The pure spatial model The pure spatial theory of electoral competition assumes:

$$\chi_{ij} = P(u_{ij} > u_{i1} \forall 1 \neq j) = P(\varepsilon_1 - \varepsilon_j < \beta(\delta_{i1}^2 - \delta_{ij}^2) : 1 \neq j) \quad (1.1)$$

In econometric terms, specification of two pure spatial models is

$$u_{ij} = X_{ij}\beta + \varepsilon_{ij} \quad (1.2)$$

where:

u_{ij} – utility of voter i from party j

X_{ij} - vector of characteristics specific to party j with respect to voter i

ε_{ij} – error term.

The difference between alternative specific multinomial probit and conditional logit models is the distribution of the error term. In case of the MNP model we have

$$\varepsilon_{ij} \sim N(\mu, \Sigma),$$

whereas in the MNL specification ε_{ij} is Type I Extreme Value distributed. The importance of this difference is the IIA hypothesis. Previous studies of electoral competition, such as e.g. Schofield et al. (1998) used the MNP approach as they conjectured the independence of irrelevant alternatives assumption of the logit model might influence the results if alternatives are close. However, recent study of Dow and Endersby (2004) shows that in reality the difference is insignificant for the purpose of electoral studies. We assume that concerning the fact that parties in our case are located reasonably away from each other the IIA assumption

should not play a major role. Another reason in favor of the MNL approach is that it, unlike the MNP allows for making equilibrium predictions on a basis of estimation results. In case of multinomial probit models this constitutes a highly complex computational task, for which no method has yet been found.

Voter-specific model

$$u_{ij} = a_i\varphi_j + X_{ij}\beta + \varepsilon_{ij} \quad (1.3)$$

where:

u_{ij} – utility of voter i from party j

a_i – vector of characteristics unique to voter i

X_{ij} - vector of characteristics specific to party j with respect to voter i

ε_{ij} – it can again be Type I Extreme Value distributed (MNL) or normal.

In this specification it is not only the spatial position of parties and voters decisive for electoral choice, but we assume that it may also be a function of various socio-demographical characteristics of voters. The argumentation for use of the MNP approach, although it's high computational complexity is the possibility to calculate marginal effects of both spatial and non-spatial independent variables, which provides deeper insight of behavior of parties.

Valence MNL model

$$u_{ij} = \lambda + X_{ij}\beta + \varepsilon_{ij} \quad (1.4)$$

where:

u_{ij} – utility of voter i from party j

λ – valence of a party i

X_{ij} - vector of characteristics specific to party j with respect to voter i

ε_{ij} – is Type I Extreme Value distributed.

Constant term in the third specification reflects *valence*, that is non-spatial characteristics of parties, such as the perception of the quality of the political leader, which was first introduced by Ansolabehere and Snyder (2000).

Voter-specific valence MNL model

$$u_{ij} = \lambda + a_i\varphi_j + X_{ij}\beta + \varepsilon_{ij} \quad (1.5)$$

where:

u_{ij} – utility of voter i from party j

λ – valence of a party i

a_i – vector of characteristics unique to voter i

X_{ij} - vector of characteristics specific to party j with respect to voter i

ε_{ij} – is Type I Extreme Value distributed.

This most general specification captures both valence as well as voter-specific features.

1.2.4 Estimation Results

Pure spatial model First the pure spatial model was estimated. Since some authors argue that independence of irrelevant alternatives might be problematic,

for the purpose of comparison we additionally fitted a pure multinomial probit model (MNP) using a maximum simulated likelihood (MSL) implemented by the Geweke–Hajivassiliou–Keane (GHK) algorithm in order to compute the multidimensional integral.

Results of the estimation are presented in Table 1.6. We observe that the sample vote shares fit quite well with the actual election results, except for the case of PIS, for which the actual result turned out to be much worse than in the presented sample. Possible reasons for this are analyzed in the following subsections.

Table 1.6: The pure MNL model results

Party	Choice	Coef. ^a	S.E.	z	$P > z $
	Spatial Distance	-.353***	.056	-6.29	0.000
		Predicted vote share	Sample vote share	Actual vote share	
	PO	40.86	39.64	41.51	
	PSL	9.31	8.59	8.91	
	PIS	37.59	39.14	32.11	
	LiD	12.24	12.6	13.15	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

Table 1.7: The pure MNP model results

Party	Choice	Coef. ^a	S.E.	z	$P > z $
	Spatial Distance	-.426***	.124	-3.44	0.001
		Predicted vote share	Sample vote share	Actual vote share	
	PO	40.86	39.64	41.51	
	PSL	9.31	8.59	8.91	
	PIS	37.59	39.14	32.11	
	LiD	12.24	12.6	13.15	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

Voter-specific models Table 1.8 presents description of variables used in the voter-specific model. Table 1.9 present results obtained from the MNL voter-

specific model. In addition to the spatial distance, individual characteristics such as education level, size of town of residence and disposable income act as independent variables.

Table 1.8: Voter-specific variables

Name		
<i>dist</i>	Spatial distance	
<i>Town</i>	Size of town	1 – country
	categorical variable	⋮
		6 – city over 500.000 inhabitants
<i>Education</i>	Education	1 – incomplete primary education
	categorical variable	⋮
		11 – higher education (Master’s degree)

In the first step of voter-specific variables selection we compared diverse specifications with the use of information criteria, and concluded that the two above presented should be used in the following regressions.²

Here we will not report full estimation results of the voter-specific MNP model, which do not differ substantially for the MNL estimates (they can be found in Table 1.27 in Appendix B. However, it is worthwhile to present marginal effects calculations obtained from this specification (Table 1.10).

The voter-specific model describes the shape of Polish politics well. For the two major parties the highest change in voting probability can be associated with the spatial distance and less with other characteristics. Out of all the candidates, the spatial distance coefficient is highest for these two parties. The factor that distinguishes between the electorate of the PO and the PIS is the town size and education. The electorate of the PO consists of inhabitants of bigger cities with relatively higher education in comparison with those voting for PIS. These two

²We expected religiosity to play a role in electoral decisions, but it turned out insignificant in tested specifications. Apparently, religious views are already fully captured by ideological positions of voters.

Table 1.9: The MNL voter-specific model results

Party	Choice	Coef. ^a	S.E.	z	$P > z $
PIS	Spatial Distance	-.476***	.069	-6.90	0.000
PO		(base alternative)			
	Town	.100**	.048	2.08	0.038
	Education	.056**	.026	2.15	0.032
PSL	Town	-.433***	.102	-4.23	0.000
	Education	-.010	.039	-0.27	0.786
LiD	Town	.012	.064	0.20	0.842
	Education	-.081**	.037	-2.18	0.029
		Predicted vote share	Sample vote share	Actual vote share	
	PO	40.86	39.64	41.51	
	PSL	9.31	8.59	8.91	
	PIS	37.59	39.14	32.11	
	LiD	12.24	12.6	13.15	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

factors seem to determine the opinions of voters in the analyzed dimensions, since the spatial distance term has particularly strong marginal effect for PO and PIS. Negative coefficient on the town size for PSL is associated with this party being considered agrarian.

The conclusive observation that can be made is that for the two biggest parties the marginal effect of spatial distance on voting probability is strong, whereas for the other two parties it is negligible. The latter parties, as already noted, are characterized by non-spatial issues that have a greater impact on their results than their actual spatial positions do. In this sense the "Downsian" hypothesis is not particularly important to the case of the LiD and PSL parties, since big changes in spatial positions lead to only a small loss or gain of votes. With regards to the PSL, it should be noted that the strongest marginal effect exists against the PO party, therefore the potential movements of this party in the political space at most affect the division of votes between the PSL and the PO. As for

Table 1.10: The voter-specific MNP model – marginal effects

Variable	Alternatives			
	PIS	PO	PSL	LiD
Spatial distance				
PIS	-.083	.104	.003	.030
PO	.080	-.111	.007	1.e-194
PSL	.003	.007	-.010	.001
LiD	1.2e-12	2.e-194	3.e-195	-.030
Case variables				
Town	-.010	.042	-.027	.006
Education	-.009	.008	.003	.001

the PO and the PIS, spatial movements lead to big differences in predicted vote shares. It would therefore be rational for them to position themselves as close as possible to the equilibrium positions, since losses of votes may outweigh the potential strategic gain for the purposes of further coalitional bargaining.

The two parties for which strategic behavior is probable in the context of coalitional bargaining are LiD and PSL. With regards to the PSL it must be pointed out that members of this party were members of 6 out of 12 cabinets since 1989, with both left as well as right-wing coalitional partners. In this sense, the position of this party may be considered suitable for becoming a member of diverse cabinets. Strategic behavior of the PSL party is therefore highly probable, combined with the weak marginal effect of spatial distance. We shall return to this observation in the post-election analysis.

Valence model Third model in question is the spatial valence model, as defined by Schofield (2007). Results of estimation are reported in Table 1.11.

Voter-specific MNL with valence Table 1.12 shows results of estimation of the voter-specific MNL model with valence.

On a basis of the MNL model with valence we estimated vote probabilities

Table 1.11: The MNL valence model results

Party	Choice	Coef. ^a	S.E.	z	$P > z $
	Spatial Distance	-.471***	.076	-6.18	0.000
PIS		(base alternative)			
PO	Valence	0.670***	.139	4.79	0.001
PSL	Valence	-1.08***	.163	-6.66	0.000
LiD	Valence	-.619***	.161	-3.83	0.000
		Predicted vote share	Sample vote share	Actual vote share	
	PO	40.86	39.64	41.51	
	PSL	9.31	8.59	8.91	
	PIS	37.59	39.14	32.11	
	LiD	12.24	12.6	13.15	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

for each party based on the economic views of the voters. Figures 1.3, 1.4, 1.5 and 1.6 present the vote share functions for all parties³. We may observe that the probability of voting for the Civic Platform party increases along with increasing economic liberalism, up to over 0.5 for those supporting the minimal interventionism. The vote share remains fairly constant along the second spatial dimension – religiosity – for each of the three parties: PO, PSL and PIS. In fact, these three candidate parties are almost collinear in this dimension. The religious dimension should influence the probability of votes going to LiD, which is also clear from inspection of Figure 1.6. We shall elaborate on the impact of each policy dimension later on.

In the case of the Law and Justice party (PIS) the probability of voting increases along with support for state control up to the maximal value of over 0.5. A possible reason for this is that the PIS is considered a populist party, and

³Smoothed vote share functions on a basis of predicted probabilities. Smoothing with the use of thin spline regression with diverse smoothing parameters λ for clarity of presentation. Note that the vote share figure for LiD is rotated, in order to better visualize change in vote share along the religious dimension.

Table 1.12: The voter specific MNL with valence results

Party	Choice	Coef. ^a	S.E.	z	$P > z $
	Spatial Distance	-.453***	.077	-5.82	0.000
PIS		(base alternative)			
PO					
	Town	.109**	.053	2.04	0.042
	Education	.064**	.035	1.84	0.066
	Valence	-.098	.297	-0.33	0.740
PSL					
	Town	-.452***	.116	-3.90	0.000
	Education	-.020	.055	-0.36	0.716
	Valence	.063	.387	0.16	0.870
LiD					
	Town	.144*	.075	1.92	0.055
	Education	.038	.049	0.78	0.434
	Valence	-1.32***	.383	-3.46	0.001
		Predicted vote share	Sample vote share	Actual vote share	
	PO	40.86	39.64	41.51	
	PSL	9.31	8.59	8.91	
	PIS	37.59	39.14	32.11	
	LiD	12.24	12.6	13.15	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

therefore aims to be perceived as providing a high amount of social benefits. The probability of voting for the Democratic Left Alliance party (LiD) also slightly increases in the economic dimension; therefore left-wing oriented voters would typically vote for this party. Most clear is the effect of support for secular values on the vote share function for this party. The specificity of the Polish political scene causes a lack of competition between PIS and LiD. LiD is perceived as post-communist, no matter what their actual values are, whereas the PIS is typically associated with traditional values and conservatism. The two parties are placed on far opposite ends of the religiosity scale. However, what is particularly important for the case of LiD is that their probability reaches a local maximum on the liberal end of the economic scale. The latter fact may be associated with the misperception of the party position described in more detail in the appendix.

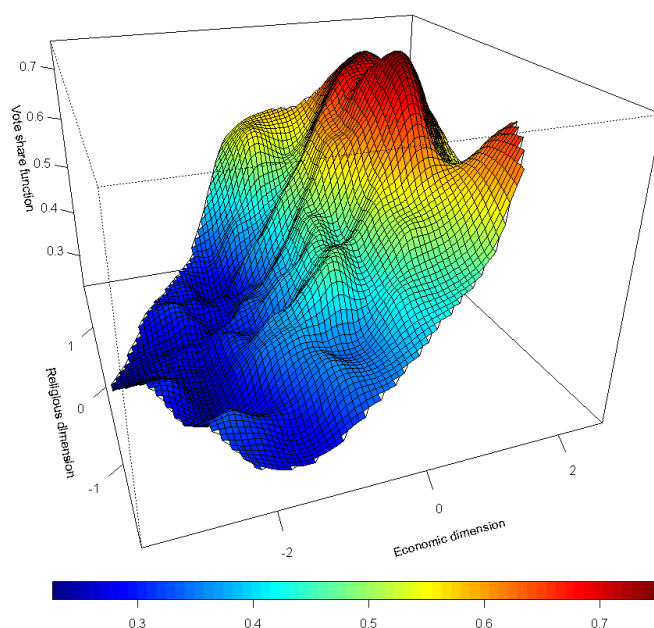


Figure 1.3: Estimates of vote shares for the Civic Platform party (PO)

The major problem in predicting vote shares of parties with the use of a small sample of voters who actually took part in the 2007 election, is that it does not account for unequal effect of abstention for electoral results. In case of our sample, it is clear that vote share, obtained only on a basis of voters who went to the polls is overestimated for PIS. A major argument one that can help explain the result is that the 2007 election was a pre-term election after two years of a coalition formed by the PIS and two minor parties (which did not receive seats in the parliament after 2007) that eventually resigned as a result of not being able to successfully govern. The strong impression of disappointment associated with the PIS after this may have resulted in far lower result than that suggested by the spatial position of the party, which actually seem to be best fitted to the ideal points of the voters. We conjecture that voters whose ideologies were well represented by this party decided to abstain, because they were dissatisfied with

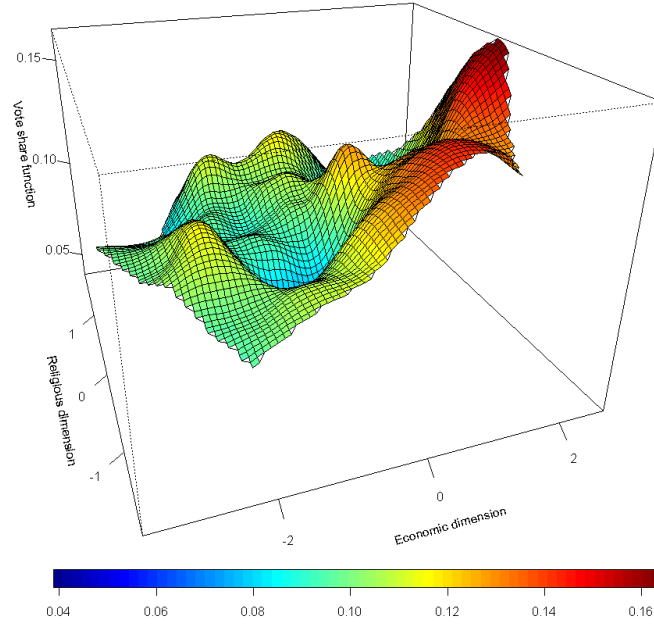


Figure 1.4: Estimates of vote shares for the Polish People's Party (PSL)

it's past performance. We associate this result with potentially uneven effect of abstentions between the two major parties, and we shall turn back to a more formal analysis of this effect later on.

Table 1.13: Information criteria

	LL	AIC	BIC
Pure spatial MNL model	-784.541	1571.084	1576.833
Pure spatial MNP model	-692.892	1397.785	1432.281
Voter-specific MNL model	-666.4099	1346.82	1387.065
Valence MNL model	-681.8814	1371.763	1394.76
Voter-specific valence MNL model	-658.6313	1337.263	1394.756

On a basis of the AIC information criterion we choose the voter-specific MNL model for the purpose of further analysis. Value of the Schwarz criterion is slightly higher, for it punishes the voter-specific valence model for low increase in likelihood compared to voter-specific pure model and at the same time substantial

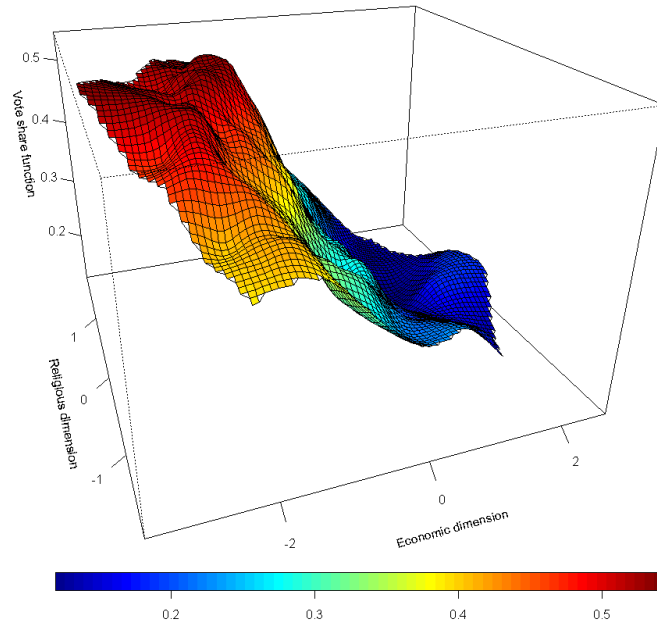


Figure 1.5: Estimates of vote shares for the Law and Justice party (PIS)

loss in degrees of freedom. Including valence allows us to make use of findings of Lin et al. (1999) and Schofield (2007) to make predictions about equilibrium positions. Moreover it seems to be a more valid description for the analyzed case, because of already mentioned negative popular image of the PIS party and post-communist view associated with LiD (described in more detail in Appendix 1)

As noted already in the introduction, Schofield et al. (2010a) uses mean electoral preferences as estimates of parties' positions. By doing so, the study *a priori* underestimates the importance of the error term in the regressions. As a result, the estimated β coefficient will be biased upwards, that is in the direction of a more deterministic model. What can be found by comparison of this work and results of Schofield et al. (2010a), obtained β coefficient differ substantially. Higher β coefficient will result in equilibrium predictions biased towards

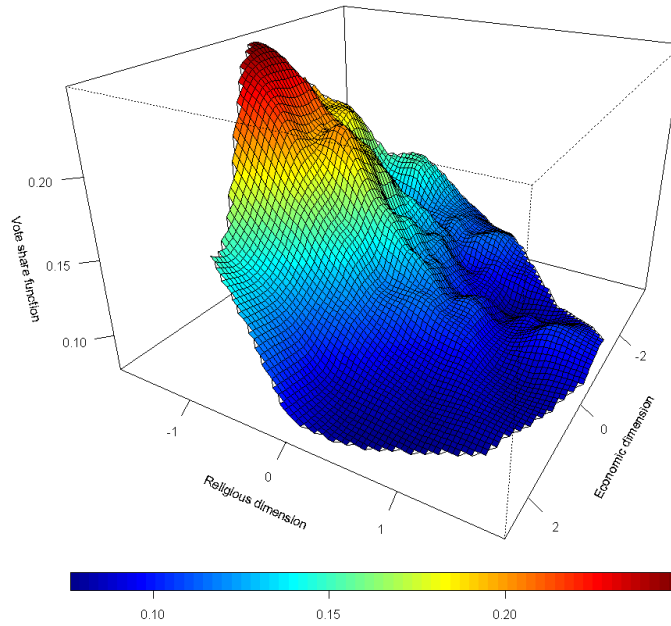


Figure 1.6: Estimates of vote shares for the Left and Democrats (LiD)

the more divergent results. We shall visualize the problem with the use of Figures 1.7 and 1.8, in which we compare actual party positions with means of electoral preferences from our sample.

First, it is clear from inspection of Figure 1.8 that mean electoral preferences do not correspond well to parties' positions used in our study. A particularly striking observation is the mean preference as well as the shape of empirical distribution ideologies (as presented in figure 1.7 of voters of LiD. Mean preference in the religious dimension is located far away from what the party officials state about their preferences. Non-spatial characteristics of parties seem to play a major role. This is also intuitively clear from high dispersion of ideal points of voters for each party (as seen in Figure 1.7). We conclude, on a basis of obtained coefficients, which are much lower than predictions of Schofield et al. (1998) that the importance of ideological distance is in reality far lower than predicted

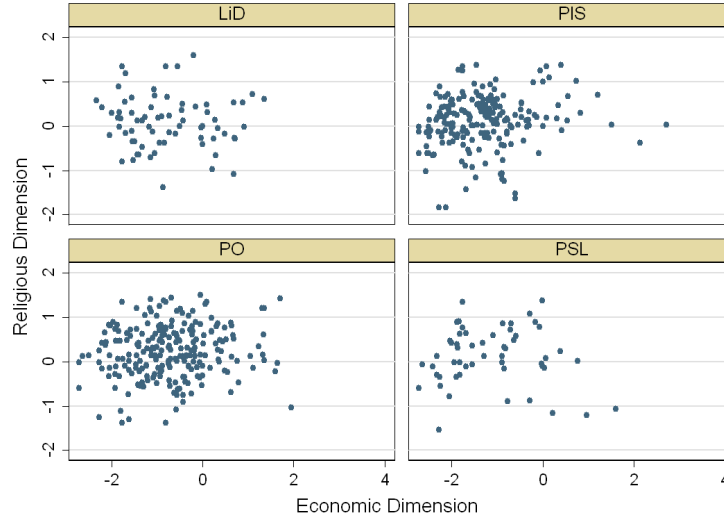


Figure 1.7: Voters ideologies by electoral choice

by Schofield et al. (2010a), under the assumption that voters' ideologies in the dimensions have not changed dramatically in the period between two elections.

1.3 Predictions from the Valence Model

Our choice to concentrate on the valence model is motivated by the possibility of application of results of Schofield (2007) to find a theoretical equilibrium of the model. Let us briefly restate the assumptions and findings of Schofield (2007). Each of the parties, in the set $P = \{1, \dots, j, \dots, p\}$ chooses a policy, $z_j \in X$, to declare to the electorate prior to the election, where X is an open convex subset of Euclidean space, R^w , with w finite. Formally, the utility of voter i is given by

$$u_{ij} = \lambda_j - \beta ||x_i - z_j||^2 + \varepsilon_{ij}, \quad (1.6)$$

where λ_j is the valence of party j , x_i is the ideal point of the voter, z_j is the party policy (declared before the election takes place) and ε_{ij} is the stochastic

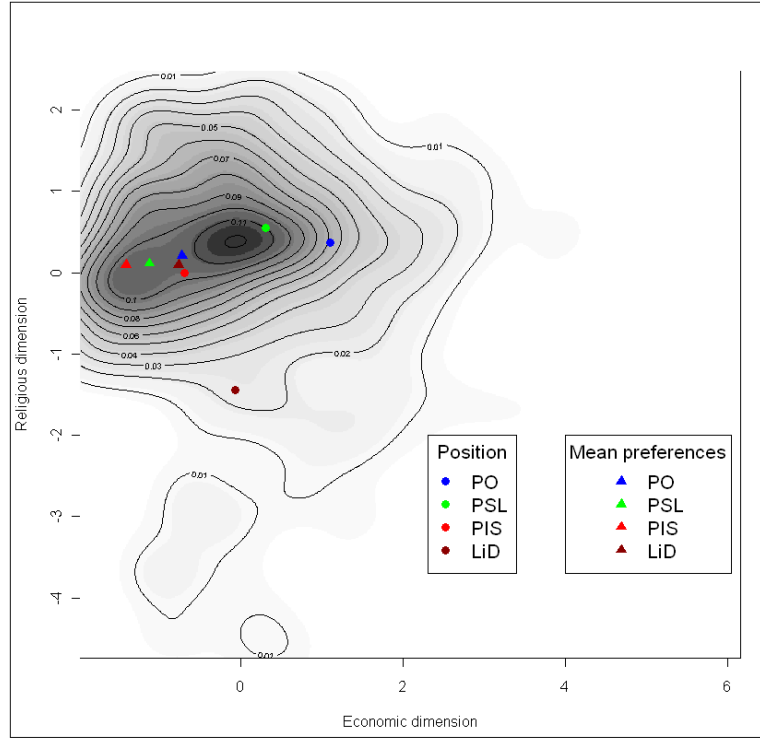


Figure 1.8: Actual positions and mean preferences of respective electors

error. It is assumed that valences are exogenous and can be ranked, so that $\lambda_p > \lambda_{p-1} > \dots > \lambda_1$. The cumulative distribution of the error terms is assumed to be C^2 -differentiable, so that the individual probability functions ρ_{ij} will also be C^2 -differentiable in the strategies z_j and the vote shares V_j defined as

$$V_j(z) = \frac{1}{n} \sum_{i \in N} \rho_{ij}(z) \quad (1.7)$$

are also C^2 -differentiable, in which n denotes the cardinality of the set of voters N . The mean voter theorem of Lin et al. (1999) shows that the joint mean vector $\mathbf{z}^* = (x^*, \dots, x^*)$ is a Nash equilibrium in the situation of zero valence. This result relies on the assumption of the concavity of vote share functions, which cannot in general be assured. Schofield (2007) defines a weaker equilibrium concept – a

local Nash equilibrium (LSNE) defined below.

Definition 1 *A strategy vector $\mathbf{z}^*$ is a Local Strict Nash Equilibrium iff, for each agent $j \in P$, there exists a neighborhood X_j of z_j^* in X such that*

$$V_j(z_1^*, \dots, z_j^*, \dots, z_p^*) > V_j(z_1^*, \dots, z_j, \dots, z_p^*) \quad \text{for all } z_j \in X_j - \{z_j^*\}. \quad (1.8)$$

It can be already seen that this definition does not rely on the global concavity of voters' probabilities functions, but the LSNE is defined as local maximum of the vote function given positions of all other parties. In a similar manner a local Nash equilibrium (LNE) is defined:

Definition 2 *A strategy vector $\mathbf{z}^*$ is a Local Nash Equilibrium iff, for each agent $j \in P$, there exists a neighborhood X_j of z_j^* in X such that*

$$V_j(z_1^*, \dots, z_j^*, \dots, z_p^*) \geq V_j(z_1^*, \dots, z_j, \dots, z_p^*) \quad \text{for all } z_j \in X_j. \quad (1.9)$$

Obviously by definitions 1 and 2 if $\mathbf{z}^*$ is a LSNE, it is also a LNE. We will further assume that the joint distribution of the error term is the Type I extreme value distribution.

The definition of a LNE as given in 2 does not rely on the global concavity of voters' probabilities functions, but the LNE is defined as a local maximum of the vote share function, given positions of all other parties. The following definitions are needed to present the main theorem of Schofield (2007)⁴.

Definition 3 *The electoral covariance matrix.*

⁴Additional minor assumptions are necessary to prove the following theorem. Please refer to Schofield (2007) for details.

1 The electoral covariance matrix is $\nabla^* = \frac{1}{n}\nabla$, where ∇ is $[(\xi_s, \xi_t)]_{w \times w}$ and $\xi_t = (x_{1t}, x_{2t}, \dots, x_{nt}) \in R^N$ is the vector of the t -th coordinates of the set of n voter ideal points and $(\cdot)$ denotes a scalar product.

2 The total electoral variance is

$$v^2 \equiv \sum_{r=1}^w v_r^2 = \text{tr}(\nabla^*), \quad (1.10)$$

where w is the dimensionality of the issue space.

Definition 4 The convergence coefficient of the valence model.

1 Define

$$\rho_j \equiv \left[1 + \sum_{k \neq j} \exp(\lambda_k - \lambda_j) \right]^{-1}. \quad (1.11)$$

2 The coefficient A_j for party j is

$$A_j = \beta(1 - 2\rho_j). \quad (1.12)$$

3 The characteristic matrix for party j is

$$C_j = [2A_j \nabla^* - I_{w \times w}]. \quad (1.13)$$

4 The convergence coefficient of the model is

$$c = 2\beta(1 - 2\rho_1)v^2 = 2A_1v^2, \quad (1.14)$$

where valence is ranked, so that $j = 1$ denotes the party with the lowest valence.

For the joint origin to be a LNE the following conditions, as given by Theorem 1, must be met.

Theorem 1 (*Schofield, 2007*) *The joint origin satisfies the first-order necessary condition to be an LNE for the valence model. The further second-order necessary condition for the joint origin to be an LNE is that every eigenvalue of the characteristic matrix $C_1 = [2A_1\nabla^* - I]$ is negative.*

In the case that X is w -dimensional then the necessary condition for the joint origin to be a LNE for the valence model is that $c < w$.

A first-order necessary condition for the joint origin to be a LNE, which it is always fulfilled whenever valence is determined exogenously is provided in Schofield (2006). Intuitively an LNE at the joint origin is less likely, the greater are parameters β , since than the model becomes more 'deterministic', v^2 and $\lambda_p - \lambda_1$.

Corollary 1 *In the two-dimensional case, a sufficient condition for the joint origin to be an LNE for the valence model is that $c < 1$.*

In the two dimensional case, an interesting case is when voters' ideologies are weakly correlated in the issues, and so the electoral covariance (v_1, v_2) is 0 or close to 0 and the two dimensions can be treated separately. In this case we have two necessary conditions, one for each dimension:

$$2\beta(1 - \rho_1)v_t^2 \leq 1 \tag{1.15}$$

for $t = 1, 2$ for z_0^* to be an LNE.

Previous formal analyses of the stochastic vote model Banks and Duggan (2005) and McKelvey and Patty (2006) have focused on conditions sufficient for

the mean vector to be a Nash equilibrium. As already noted this has involved assuming that the vote share functions are concave. Obviously, if the necessary condition given in Theorem 1 fails at the joint origin, then so must concavity. This casts doubt on the existence of Nash equilibria in these vote models. The natural question is whether there can be multiple local strict Nash equilibria, but no Nash equilibria. Schofield (2001) shows generic existence of LSNE as long as a certain boundary condition is satisfied. This suggests that, in general, there will exist many different, non-convergent LSNE.

We now turn to the empirical analysis of above quoted findings for the case of Polish parliament 2007-2010. Referring back to table 1.12 we find that the lowest valence party is LiD and that the β coefficient equals 0.453. Covariance matrix of voters' position is given in (1.3).

$$\nabla_0^* = \begin{bmatrix} 0.983 & 0.071 \\ 0.071 & 0.351 \end{bmatrix}$$

The characteristic matrix for the LiD party is

$$\rho_{LiD} = \frac{1}{1 + \exp(1.32) + \exp(1.32 + 0.098) + \exp(1.32 - 0.063)} \simeq 0.08$$

and

$$C_{LiD} = (2 \cdot 0.453 \cdot (1 - 2 \cdot 0.08)) \begin{bmatrix} 0.983 & 0.071 \\ 0.071 & 0.351 \end{bmatrix} - I = \begin{bmatrix} -0.255 & -0.053 \\ -0.053 & -0.734 \end{bmatrix}.$$

The eigenvalues of the C_{LiD} matrix are equal -0.249 and -0.740 for the economic and religious dimension respectively. The corresponding eigenvectors

are $\begin{pmatrix} -0.994 \\ -0.109 \end{pmatrix}$ and $\begin{pmatrix} -0.109 \\ 0.994 \end{pmatrix}$. The positions of voters and parties, as visualized in figures, are presented after a varimax rotation of the factor loadings, thus it is not surprising that the eigenvectors are almost parallel to the economic and religious dimension axes.

We first tested for whether a covariance matrix is diagonal. $\chi^2(1)$ test value of 34.58 shows that the diagonality hypothesis has to be rejected at 1% level. For this case as noted by Schofield (2007) by a transformation of coordinates, we can choose respective variances in each dimension to be the eigenvalues of the Hessian matrix for agent with the smallest valence, and let these be the new 'principal components' of the electoral covariance matrix. We shall call the principal electoral axis, the eigenspace corresponding to the eigenvalue with higher absolute value, so in other words with higher variance of the transformed issue space, whereas the perpendicular axis will be called a minor electoral axis. In order to visualize these results, we present in Figure 1.9 density of voters positions, positions of parties and electoral axes crossing the mean of the distribution of preferences. The blue line corresponds to the main electoral axis along the economic dimension and red is the orthogonal minor axis. Both eigenvalues are negative which means that, if all other parties stay at the electoral origin, than the joint origin fulfills the necessary condition to be a LSNE for the analyzed model. In order to check the sufficient condition we calculate the total electoral variance and the convergence coefficient as follows:

$$c = 2\beta(1 - 2\rho_1)v^2 = 2\beta(1 - 2\rho_1)\text{trace}(\nabla^*) = 2 * 0.38 * 1.33 = 1.01 > 1$$

Value of the convergence coefficient is slightly over 1, indicating that the sufficient condition for convergence is not fulfilled, though this might be a result of computational inaccuracy. It is related to high variance of preferences in the economic dimension, and what follows only a very weakly concave vote share function (the eigenvalue equals -0.249). Although this fact does not *sensu stricto* preclude convergence to the joint origin, when we recall vote share functions shape, we must conclude that it is unlikely along the axis associated with the economic dimension.

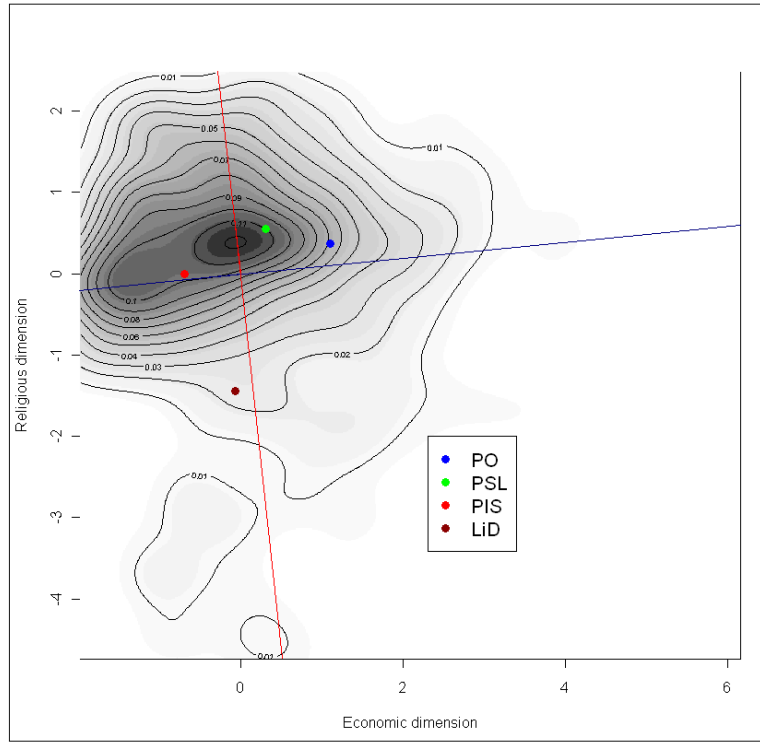


Figure 1.9: Density of voters' positions, parties locations and electoral axes

Along both axes the gradient of parties' probability functions points towards the joint origin. However, as can be already inferred from the shape of the distribution of preferences, which are more dispersed in the economic dimension, and also from the absolute values of eigenvalues of the characteristic matrix,

along the blue axis the convergence is weaker. High concavity of the vote share functions aligned with the minor axis implies that parties should be located close to or at the major electoral axis. This is the case for three parties – PO, PSL and PIS, whereas the lowest valence party – LiD is located far away from the major axis. What can be inferred from the conditions provided by Schofield (2007), we should have that the lowest valence party in the local equilibrium is located closest to the origin and higher valence parties move further away from the joint origin.

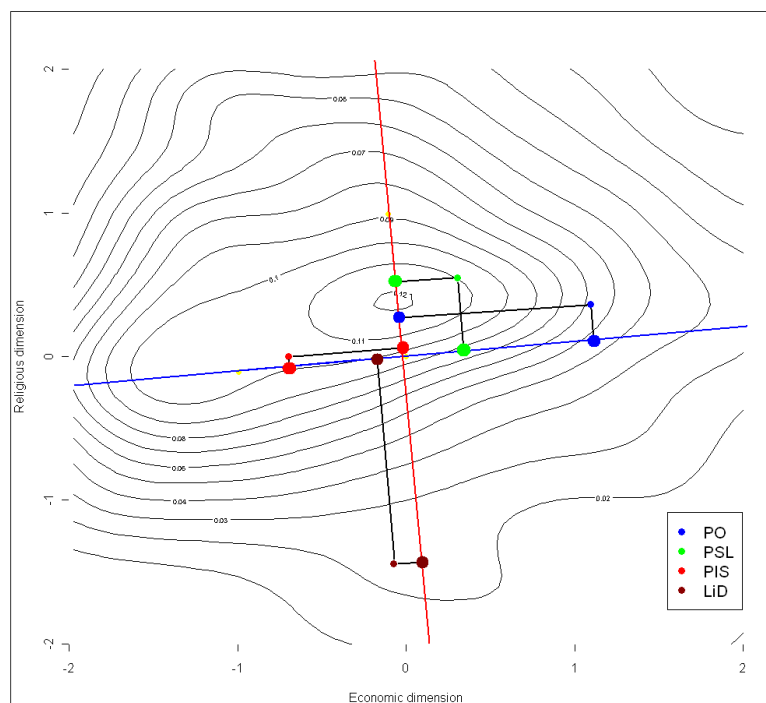


Figure 1.10: Density of voters' positions, parties locations and electoral axes – close-up and projections

Figure 1.10 presents a projection of parties' positions on the electoral axes. LiD (dark red), as expected remains close to the joint origin along the major electoral axis. Other parties' valences are almost equal (for PO and PSL these were not significantly different from zero) so in the local equilibrium they should

be located in more or less equal distances from the joint origin. Along the second electoral axis convergence is strong for three parties: PSL, PIS and PO, who place themselves very close to the position of the mean religious ideology. The case of LiD, considering the historical context (presented in more detail in Section 1.2 and appendix 1) is not surprising. The lack of convergence in the religious dimension is an understandable consequence of being policy-oriented in this dimension. This result (together with the analysis of post-electoral behavior in Section 1.5) leads us to the conclusion that LiD is not a vote-maximizing party in the religious dimension of competition.

1.4 The Problem of Abstentions

Voter turn-out in the election of 2007 barely exceeded 50% (53.88%).

There are three potential explanations for the low turnout directly arising from the original spatial voting theory. These are alienation, indifference and differences in the cost of voting among groups of voters. The fourth hypothesis is the impact of non-spatial characteristics of the parties, which is not directly included in the pure spatial model. We shall test each of these hypotheses in turn, noting that they are not necessarily contradictory.

We test hypotheses of non-spatial characteristics of the parties and the impact of the cost of voting on turnout in one specification. As already noted, we observe the electoral choices only for individuals that planned to take part in the upcoming election. The ideological positions are, however observed for the whole sample. To solve this problem, we proceed in the following way. On a basis of a valence voter-specific spatial model we make probability predictions for the out-of-sample observations. If we assume that the voter-specific valence model

generates the electoral choices of voters in the whole population, these out-of-sample predictions will be unbiased. Table 1.14 presents summary statistics of the vote shares in the two groups.

Table 1.14: Vote shares for voters and abstainers

	Voters	Abstainers	Equality of means t-Test
PIS	39.71	44.73	-4.68 ^a
PO	39.00	32.28	3.54 ^b
PSL	8.85	11.14	-4.18 ^c
LiD	12.43	11.83	1.80
No. Obs.	579	259	

^aRejection at 1% level against the alternative that more voters of PIS are in the abstainers group

^bRejection at 1% level against the alternative that more voters of PO are in the voters group

^cRejection at 1% level against the alternative that more voters of PSL are in the abstainers group

The main problem connected with voter abstention is how it actually influences the results of the election. We observed that the probability obtained from the spatial model for the Law and Justice party differs substantially from their actual result. If abstentions had on average the same effect for every party, this would not cause the results to differ between the whole population and the sample that actually voted and this was not true in the 2007 election.

According to the CBOS report on identification (CBOS Report BS/34/2007) the PO party is perceived by 40% of voters, and the PIS party by 39% of voters, as "best representing their (voter) interests" These two parties are the only ones that are more often than not perceived as well representing the opinions of voters. However, PO is characterized with a positive average of grades, whereas PIS has a negative average, meaning that for the case of PO we may state that the strength of their support is higher than that of their opponents, whereas in the case of PIS the relation is the opposite. Therefore, we may predict that among the 50% of people who actually go and place their ballot, the fraction of PO-supporters

would be higher. Moreover the fraction of PIS opponents has increased by 12 percentage points since 2005, again supporting the hypothesis that this party has disappointed the public with their poor performance in the governing coalition during the 2 years prior to the election. These voters may have augmented the group that refused to take part in the election. This fact may contribute to understanding the lack of correspondence between predicted probabilities and the actual ones.

We shall now test this hypothesis in a formal way. As expected, the t-Test results presented in Table 1.14 show that the hypothesis of equal vote shares for PO, PIS and PSL between voters and abstainers has to be rejected. For LiD the difference is not statistically significant.

In the second step we run a logit regression of the abstention decision with the probabilities, which we obtained in the first step as explanatory variables. Since voting for particular parties has been also related to the size of town, we add interaction terms between the probabilities and each level of town size (we report the full results in appendix 2). In the same specification we also include various turnout determinants arising from the rational voter hypothesis and the subsequent literature. The average level of income as well as the level of education has been found to affect turnout at the polls. Aldrich (1997) states that better educated and wealthier citizens are more likely to vote since they pay more attention to local as well as national politics and this decreases their cost of gathering information about positions of parties. In this, internet access should also affect the cost of information, so we add a dummy equaling 1 whenever an individual declared she is using internet resources. The impact of age on the probability of going to the polls is a well-established fact in the political science literature (see, e.g. Topf (1995)), and that the relationship is non-linear,

reaching a peak for middle-aged individuals. We control for this by adding age and age squared variables to the regression. Moreover, we add potential effects of sex, religiosity and labor union membership as conjectured in various studies of turnout to impact the voting behavior. Individuals in the analyzed survey have also answered two questions directly related to turnout:

- 1 How would you describe your general level of interest in politics? (in a 1–7 scale, where 1 denotes high interest for politics)
- 2 Does it make sense to go voting for influencing political outcomes? (1–7 scale; 1 – Voting does not make sense because it does not change anything, 7 – How people vote has a big impact on whether situation of country will change for the better)

These variables together with a dummy variable indicating whether an individual took part in 2005 elections shall reflect the general level of interest in politics. Full estimation results are presented in Table 1.20, which can be found in Appendix B. The most interesting variable for the unequal effect of abstentions is the one which identifies voter as a potential elector of PIS. Being classified as the elector of the Law and Justice party significantly decreases the probability of going to the polls. Table 1.15 shows the marginal effect and the elasticity for this variable.

Table 1.15: Average marginal effect and elasticity – electors of PIS

	Coeff.	Std. Err.	z.Stat.
dy/dx	-1.5785**	0.732	(-2.15)
$d(\log(y))/d(\log(x))$	-1.2436**	0.591	(-2.10)

Increase in probability of voting for PIS by 1% is associated with decrease in the probability of going to the polls by 1.58%. The level of education, associated

in the literature with decreasing cost of voting, positively affects (at 5% level) the probability of voting. Age and squared age have respectively positive and negative signs, what confirms the inverted U-relationship between age and voting found in turnout studies. Among other significant variables we found that the voting probability is higher for male population and that the general interest in politics and fact that a voter took part in the 2005 elections also positively affect turnout. The Effect of the town size, which could also be associated with the cost of voting disappeared when we added interaction terms between probabilities of voting for a particular party and the town size. From this fact we conclude that town size effect is not associated with the cost of voting. On the other hand we identified a significant positive effect of education level on turnout. This confirms that there are indeed differences in the cost of voting among analyzed voters.

Alienation occurs when voters find that no party satisfies their ideological beliefs. In formal terms, individuals vote only if

$$|U_i(P^*) - U_i(P_j)| < \delta_i, \quad (1.16)$$

where δ_i is a voter-specific positive constant. In other words, voter decides to abstain if there exists no party which ideal point would lie close enough to his own preferences. If we assume that other characteristics of voters and parties are random, that is are on average equally distributed along the analyzed sample, alienation should be reflected by the average distance of voters' bliss points to parties' ideals. More precisely if the average distance to the closest party is higher for abstainers than for those who voted, it will be an indication of the alienation hypothesis. Graphically this should be indicated by abstainers' ideal points lying in the outer regions of the preferences' distribution. Figure 1.11 presents location

of voters and abstainers in the issue space. Visual inspection of the graph suggests that abstainers are located unevenly, but there is no visual evidence for them to be located far from the center of the distribution.

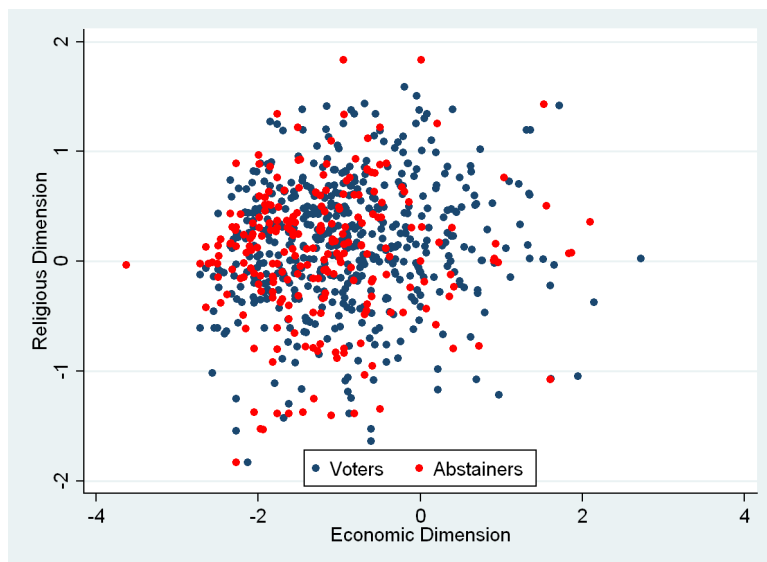


Figure 1.11: Distribution of ideal points of voters and abstainers

According to a 2007 CBOS study, only 33% of Poles believe that among the competing parties there is one that represents their opinions well (CBOS Report BS/73/2007). The first impression that strikes one is that, according to the estimated voter positions (seen in Figure 1.2) three of the parties, that is the PO, the PSL and the PIS, place themselves in good positions that cover the area with the highest density of voters, so that one might think that this would preclude voter abstention.

We now turn to more formal test of the alienation hypothesis. We test whether on average voters in the abstainers group are those located farther away from locations of parties. The variable, which is being tested is the mean distance of the voter's ideal point to the spatial location of the party closest to him. We shall test the differences in distance separately for voters in each education group,

due to the differences in the cost of voting as identified in the results above. Full results are reported in Appendix B. In Table 1.16 we focus on the most important findings.

Table 1.16: Average distance to the closest party – t-Test Results

Group	No. Obs	Hypothesis
Education=1,2 and 3	151	H_0^a
Education=4	208	H_1^{**bc}
Education=5 and 6	91	H_0
Education=7	201	H_0
Education= 8 and 9	49	H_0
Education=10	42	H_1^{**}
Education=11	96	H_1^*

^aNull hypothesis of equality of means

^bAlternative hypothesis in favor of alienation

^cSignificance: *** 1 percent, ** 5 percent, * 10 percent

Results reported in Table 1.16 are not in favor of the alienation hypothesis for the whole sample of voters. The hypothesis of equality of means in the two groups is rejected for voters in three education groups, among which in two groups at 5% level in favor of the alternative that the mean distance to the closest party is higher in the abstainers group. Alienation is significant for the group of voters with low education level (group 4), who constitute a big share of the tested voters, and these individuals are also associated with higher probability of voting for PIS, as predicted by the spatial model. This result confirms the cited findings of CBOS report, that electors of PIS feel more alienated.

Indifference means that parties are so close in terms of the ideology, so that the utility gain of having a most desired outcome over the alternatives does not exceed the cost of voting. In formal terms in a multiparty setting, a voter will abstain if

$$|U_i(P^{max}) - U_i(P^{min})| < e_i, \quad (1.17)$$

where by P^{max} we denote the closest alternative, P^{min} is the worst possible outcome and e_i is a positive constant. In this case, abstention should be on a part of voters positioned in the center of distribution, with relatively equal distances to each of the competing party. We shall obtain a confirmation of the indifference hypothesis if the difference between the utility from the closest and the farthest alternative is smaller for abstainers. In terms of education level as determining the cost of voting we proceed similarly to the case of alienation hypothesis. We report the results of the mean comparison test in Table 1.17.

Table 1.17: Indifference hypothesis – t-Test Results

Group	No. Obs	Hypothesis
Education=1	6	H_0^a
Education=2	136	H_1^{1***bc}
Education=3	9	H_0
Education=4	208	H_0
Education=5 and 6	91	H_0
Education=7	201	H_1^{**}
Education= 8 and 9	49	H_0
Education=10	42	H_1^{2***d}
Education=11	96	H_0

^aNull hypothesis of equality of means

^bSignificance: *** 1 percent, ** 5 percent, * 10 percent

^cAlternative against the indifference hypothesis.

^dAlternative in favor of indifference hypothesis

Only in one group of voters we found support for the indifference hypothesis. For all the other levels of education, we find no evidence for difference in means. In some groups, the difference in utility is *higher* for the abstainers group.

As a conclusion we state that the observed differences in utilities connected with alienation and indifference might have substantial effect on turnout in the group of well-educated voters, who are at the same time not in favor of PIS. We found evidence for alienation in education level 4 (thus, worse educated individ-

uals, who constitute a big fraction of our sample), which is fully consistent with the fact that these are by major part electors of PIS and with the cited study of compatibility of political representation with voters' preferences. These two empirical studies are a strong confirmation of the alienation hypothesis associated particularly strongly with the Law and Justice party, as having a substantial impact on the unequal effect of abstentions for the major parties.

1.5 Coalitional Behavior

In September 2005 after the parliamentary election was held the previous government resigned. The 2005 election was won by the Law and Justice party (PIS), which had a slight advantage over Civic Platform (PO) Results of the election in 2005, the number of seats at the beginning and the end of their term of office and the 2007 results are presented in Table 1.18. Kazimierz Marcinkiewicz from the PIS was designated Prime Minister and was expected to form a government within two weeks after the election. His goal was to form a grand coalition of the PIS and PO, but he did not succeed and until May 2006 his cabinet remained a minority government.

In May 2006 a coalition of the PIS, SO and LPR parties was formed and Jaroslaw Kaczynski – the leader of the PIS – became the prime minister. The SO or Self-Defense party is a left-wing populist party with agrarian roots that maintains a skeptical attitude towards the European Union. The LPR or League of Polish Families party is a nationalist ultra-conservative party, which is often virulently anti-Semitic and associated with neo-Nazi values represented by the "All-Polish Youth" (an ultra-nationalist youth organization whose former leader later became the leader of the LPR party). The only link connecting the three

Table 1.18: Results of the election in 2005, the number of seats at the beginning and the end of term of office and the results of the 2007 election.

Name	Abbreviation	Seats 2005 - start	Seats - end	Seats 2007
Platforma Obywatelska (The Civic Platform)	PO	133	131	209
Polskie Stronnictwo Ludowe (Polish People's Party)	PSL	25	27	31
Prawo i Sprawiedliwość (Law and Justice)	PIS	155	150	166
Samobrona RP (Self-Defense of the Republic of Poland)	SO	56	41	0
Liga Polskich Rodzin (League of Polish Families)	LPR	34	29	0
Sojusz Lewicy Demokratycznej (Democratic Left Alliance) - 2005, Lewica i Demokraci (Left and Democrats) - 2007	SLD, LiD	55	55	53
<i>Mniejszość Niemiecka</i> (German Minority) ^a	MN	2	2	1

^aThe German Minority party obtains most of their votes in the south-eastern part of the country and as a minority party it is not obliged to pass the 5% threshold. Traditionally, it supports the government regardless of its political stance.

parties' ideologies was their shared skepticism towards the EU and their mutual inability to make an alliance with any other political force. After a substantial number of members of these three governing parties left to become un-associated members or to join other parliamentary parties, the coalition lost its majority (to a sum of 220), was disbanded in 2007 and new election was held. After the two lesser coalition parties failed to obtain seats in the current parliament, the PIS tried to benefit from this fact and moved further along the ideological scale towards conservative values and a left-wing market view.

In Table 1.19 the sum of seats in April 2010 equals 444 due to the recent death of 14 deputies. Their mandates are to be replaced with candidates who received second-largest number of votes in respective lists. Two additional elected deputies declined to vow affirmation. Poland Plus is a party formed in January 2010 from deputies who crossed the floor from PIS.

Table 1.19: The number of seats in 2007 and 2010

Name	Abbreviation	Seats – 2007	Seats – April 2010
Platforma Obywatelska (The Civic Platform)	PO	209	203
Polskie Stronnictwo Ludowe (Polish People’s Party)	PSL	31	28
Prawo i Sprawiedliwość (Law and Justice)	PIS	166	150
Lewica i Demokraci (Left and Democrats)	LiD	53	-
Lewica (The Left)	Lew	-	40
Socjaldemokracja Polska (Social Democracy of Poland)	SDPL	-	4
Stronnictwo Demokratyczne (Democratic Party)	SD	-	3
Polska Plus (Poland Plus)	PP	-	8
Independents	-	-	9
<i>Mniejszość Niemiecka</i> (German Minority)	MN	1	1

1.5.1 The Political Heart in 2007

Figure 1.12 presents the location of the heart, the uncovered set, the yolk, winset of the status quo located at the yolk as well as Shapley–Owen power indices of parties (under simple majority rule). The heart is the triangular-shaped area bounded by median lines connecting ideal points of PSL, PO and LiD, marked in the figure with dark-red lines. A green cross-shaped point is the center of the yolk. Yolk, as defined in McKelvey (1986) is the smallest ball in R^n that intersects all median hyperplanes. A formal definition of the uncovered set can be found in McKelvey (1986). Loosely speaking, it can be said that given points x and y in an issue space and some distribution of ideal points, the point x covers y if and only if x defeats y , x defeats every point y defeats, and x defeats or ties every point y ties. The uncovered set consists of all points that are not covered by any other point. McKelvey (1986) also shows that a circle, centered on the yolk, but with a radius 4 times larger, bounds the uncovered set. Moreover, if the core

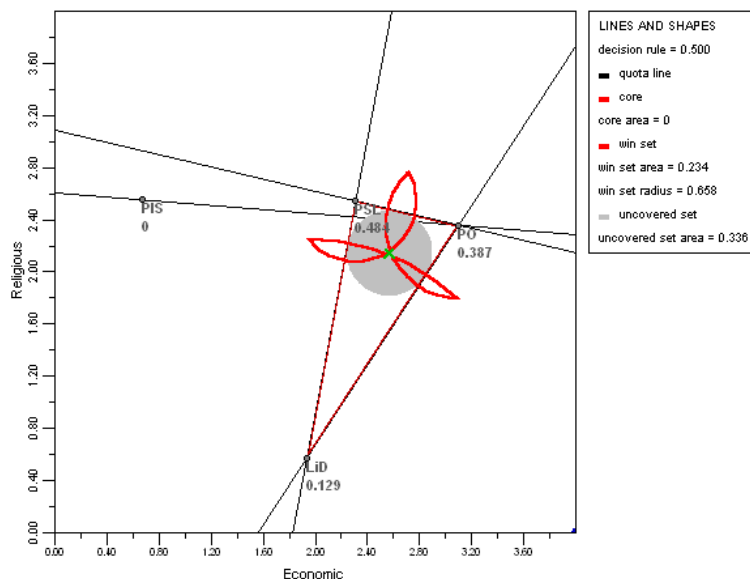


Figure 1.12: The Polish Parliament in 2007 – the uncovered set, the yolk and the heart

exists in a particular game it coincides with the uncovered set. Boundaries of the uncovered set are presented with a gray-shaded area in Figure 1.12. Winsset of a status-quo located at the center of the yolk consists of three elliptic-shaped areas, marked with thick red lines. We may already observe that winsset of the center of the yolk expands beyond boundaries given by median lines, thus it also covers part of the issue space not located within the heart.

A formal definition of Shapley–Owen power indices can be found in Feld and Grofman (1990). Here it is enough to say, that Shapley–Owen value of a particular party is the probability of randomly selecting a line, such that when all other parties are projected on to the line, the party is a median one. High Shapley–Owen power index indicates that a particular party remains close to the political center e.g. defined as a yolk of the coalitional game. Shapley–Owen values indicate a much higher power of PSL than suggested solely by their electoral result. This is due to the central location of their ideal point. Given

their position in both dimensions, PIS does not have any power in parliamentary voting. Finally, we observe that the core of the game is empty.

In the case of Poland we observe that the heart is the area within the three median lines crossing the ideal points of the PO, PSL and LiD. We may predict that the government that forms shall include at least one of these parties. Traditionally the party that obtains the highest number of seats is designated to form a coalition, therefore we predict that either a PO/SLD or PO/PSL coalition will form. Of the two, the PO/PSL coalition is the minimum winning coalition. In fact it is also the minimal connected winning coalition along the economic dimension.

The PO and PSL form the actual coalition that has governed Poland since 2007 and this government was able to gain a vote of confidence by a simple majority. It is the one predicted by all the theories cited. However, due to political situation within years 2007-2010 a simple majority was insufficient to pass bills vetoed by the president (a more detailed description of constitutional provisions regarding voting in the parliament is to be found in the appendix), so that in fact a $3/5$ majority was needed. The party that turned out to support the governing coalition is the LiD (with whose votes 289 over the necessary 276 votes can be obtained). Though not formally in the coalition, LiD has turned out to play a pivotal role when it comes to passing acts, since the presidential veto for new bills was almost always assured. Therefore, we may predict that political outcomes that lie not only at the median line for PO and PSL but also in other parts of the heart shall occur. Figure 1.13 presents 20 randomly drawn proposals (marked with red crosses), assuming that PO is the agenda setter (which is justified assumption given that the spokesman of the Sejm is a member of this party) based solely on positions of parties and power indices. More precisely, we start

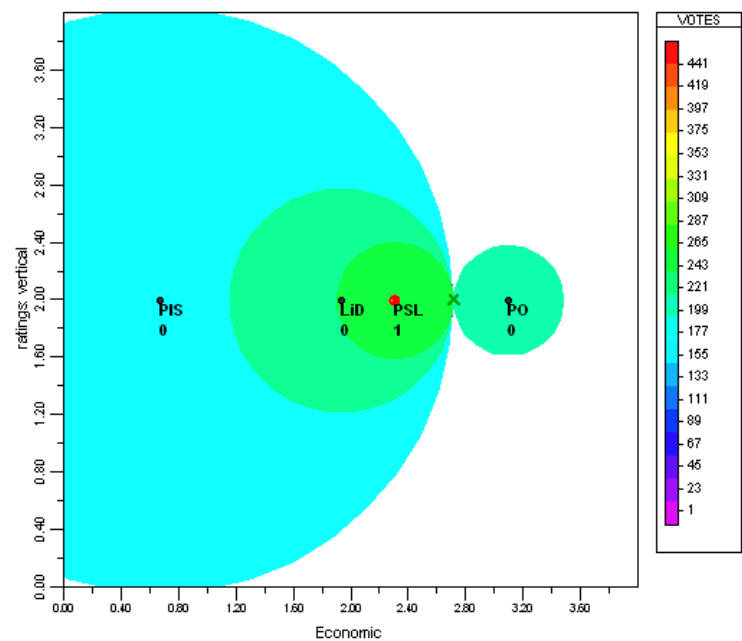


Figure 1.14: Voting in the economic dimension

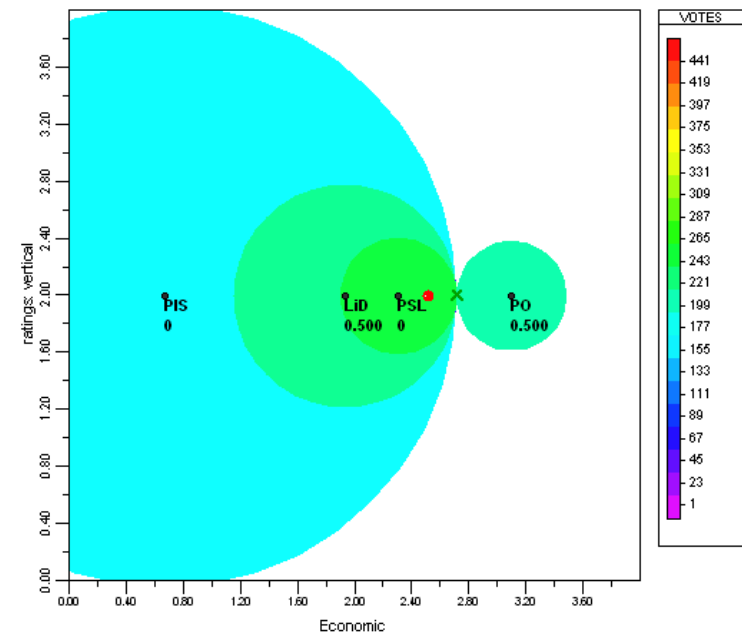


Figure 1.15: Voting in the economic dimension – 3/5 majority

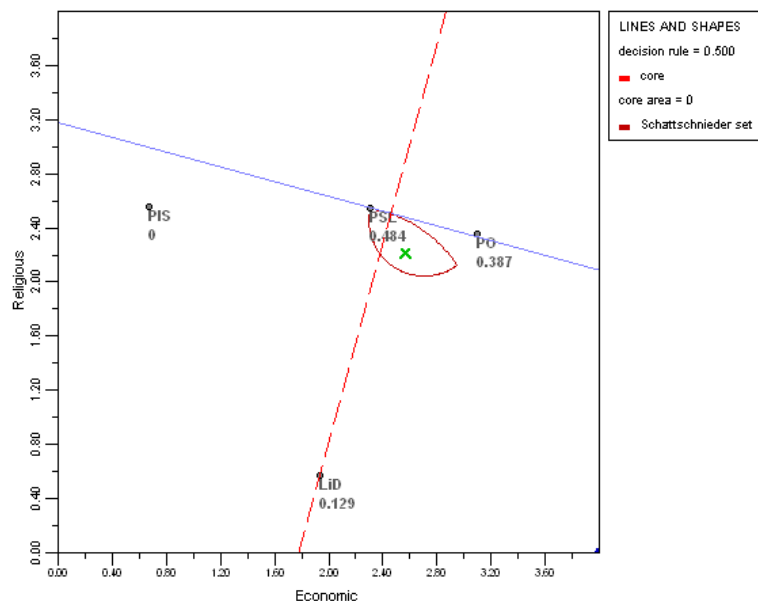


Figure 1.16: The Schattschneider set

ner (Copeland (1951)), which is a point in the area space with the smallest winset (or in other words Copeland's method is a Condorcet method in which the winner is determined by finding the candidate with the most pairwise victories), is marked with a red point. It can be easily calculated as the weighted average of parties' ideal points with weights being Shapley–Owen values. We conclude that under simple majority rule the Copeland winner along the economic dimension is located exactly at the ideal point of the PSL party which gives it a very strong voting power (in terms of the Shapley–Owen index). Whenever the simply majority is insufficient for passing a bill, and a $3/5$ majority is needed (i.e. as a result of a presidential veto) the Copeland winner is located more to the right of the economic dimension and voting power is split equally between LiD and PO 1.15. This again confirms the previously mentioned power of the LiD party to override the veto.

Voting in both dimensions Figure 1.16 shows the size and location of the Schattschneider set. A well-known solution concept, which is a dimension-by-dimension median, has a major drawback, that it is not invariant to linear transformation of voters' ideal points (see, Shepsle (1979) and Marakulin and Zakharov (2009)). This means that the outcome of voting on each issue separately may depend on the voting agenda. This also means, that how one rescales (e.g. by means of rotating the issues space) the factors used to construct ideal points of parties, could result in different predictions. Instead of the dimension-by-dimension median, Feld and Grofman (1988) proposed a solution concept, the Schattschneider set, which consists of all policies that can in some rotation of the issue space represent the median in both dimensions. Moreover, Marakulin and Zakharov (2009) show that a generalized version of the Schattschneider set (formal definition of can be found in Austen-Smith and Banks (2005)), which allows for any non-degenerate linear transformations of voters' ideal points for the two-dimensional case coincides with the locally uncovered set of the issue space. We expect the Schattschneider set to be a solution concept, which in a reliable way describes the possible outcome of voting when bills are proposed by both coalitional partners and in both dimensions, since it takes into account the fact that a minor coalitional partner is located centrally, and has a strong impact on proposed policies, and this strength cannot be easily altered by the agenda-setter. Figure 1.16 shows that the Schattschneider set is located close to the PSL's ideal point, so we expect the bills to be under strong influence of the minor coalitional partner.

1.6 Analysis of the Pension System Reform 2007–2009

1.6.1 Description of the Legislative Process

To compare the findings of the public choice theory as given in Section 1.5 with the actual policy choices we conducted a case-study of the pension system reform. It has been so far the most controversial and one of the most important bills enacted by the current government. Shortly after the election in 2007, the government started working on the new law, which would modify the rules by which individuals employed in certain industries and types of occupations are allowed to go to early retirement. These occupations include especially difficult and health harming working conditions (such as in heavy industries) and other types of occupations, described in the portrayed act as "of special nature" (air traffic supervisors, emergency and rescue officers etc.). The early retirement bill in force in 2007 enclosed a very broad definition of special working conditions and an extended list of occupations which were entitled to early retirement. The number of workers entitled summed up to roughly 1.2 million (out of total 9.5 million employed).

The key part of the parliamentary debate as well as the public consultation was the list of eligible occupations. The government took a position that the list shall be very restricted, to retrench budgetary spending on this issue. The most controversial point of the debate has been abridging most school teachers of the right to go into early retirement. Both opposition parties opted for retaining this right. This as well as other moot points of the described act were subject to the public discussion during sittings of the Trilateral Commission for Economic and

Social Issues consisting of representatives of the government, labor unions and employers' associations.

The government proposal of the first draft of the amended bill published in May 2008 included a list of 50 occupations eligible for early retirement. The estimated number of entitled individuals was 170,000 employees (Rzeczpospolita (2008)). During the next months, the list has been elongated and the final draft accepted on 30th of September 2008 (www.premier.gov.pl (2008)) included the list of occupations, which did not however contain demands of labor unions stipulated during sittings of the Trilateral Commission, which ended in a fiasco. The number of workers entitled rose, however to about 270,000 due to changes in definitions of certain terms and broadening of age qualification (PAP (2008c)).

A still unresolved problem was the issue of an early retirement possibility for school-teachers. It has been the most controversial aspect of the proposed bill. Moreover, it has been particularly important, since by the time the draft was brought up for parliamentary discussion it was clear that Lewica⁵ will oppose it unless it contained more privileges for school-teachers (PAP (2008b)). In a case of a presidential veto, which was almost assured, coalitional government would have to comply with the postulates of the Lewica party to ensure support for the discussed bill.

An additional complication was caused by the fact that the act in force by the end of 2008 would become void at the beginning of 2009, thus in case a new law had not been passed all those eligible for early retirement on the basis of the previous law would have lost their privileges, so the government acted under huge pressure to complete the preparation of the new act by the end of 2008.

⁵A direct successor of the LiD, which was disbanded in April 2008, therefore by the time the analyzed law has been prepared.

Nevertheless, the prime minister decided to postpone voting on the the law until the very end of the year, so that if the president had vetoed the new act, political responsibility for a discontinuity of the law would fell on him.

First reading of the new act was held in the parliament on the 17th of October 2008 with an immediate motion to dismiss it put forward by Lewica and PIS. According to the press reports on the 20th of October (PAP (2008a)), Lewica would oppose the presidential veto provided the government agrees to add school-teachers to the list of occupations, which was however unacceptable for the governing coalition. After the second reading on the 28th of October a total of 71 amendments were proposed. 44 of these were proposed by Lewica party, 21 of which concerned adding additional occupations to the list of eligible for early retirement. Out of these 21 amendments only 3 were accepted by votes of the governing coalition.

Crucial amendments that were added to the bill after negotiations with Lewica concerned school-teachers. The government and the opposition party Lewica agreed to compensate teachers for the lost early retirement entitlement in a form of raising the initial capital level used to calculate the level of pension (Sejm (2008a)). The exact formula to calculate the level of the compensation is provided in the cited document, and it could be estimated as equalling roughly 80% of what would have been provided in case teachers had been entitled to early retirement under the new law. Roughly 180,000 employees were qualified for the compensation payment (out of around 400,000 who had been eligible for early retirement under the previous act). The bill passed in the Sejm on the 6th of November, however opposition, including Lewica voted against it (Sejm (2008b)). Several days later the higher chamber of the Polish Parliament also accepted the new law, without additional amendments.

On the 15th of December, the president decided to veto the bill. At first Lewica stated that it would vote to support the veto, so it became clear that definite shape of the bill is still subject to negotiations. Lewica again demanded early retirement for school-teachers and further expanding the catalogue of occupations eligible. It also threatened the coalition with bringing the bill before the Constitutional Court, which would further delay the legislative process. Finally, the coalition gave consent to a proposal of raising the compensation for school-teachers to a value of 100% the prospective early pension, without adding any new occupations to the list. In other words, it in practice agreed to provide school-teachers with pensions of the same amount as scheduled under the early retirement scheme. The presidential veto was overruled on the 20th of December 2008, by votes of PO, PSL and Lewica (a total of 285 over required 267 votes) and on the 18th of March 2009 the Sejm unanimously accepted the amendment concerning compensation scheme for school-teachers.

It is not possible to precisely determine the ideal points of each coalitional partner in the particular case of the early retirement bill, however it is clear that at least a part of PSL members of parliament opted for enclosing school-teachers in the list of occupations entitled for early retirement. Minister of Labor and Social Policy, Jolanta Fedak, a member of PSL announced on the 18th of November 2008, that she will propound a draft of an early retirement bill, which would include school-teachers. This draft would be proposed as a legislative initiative of a group of deputies and not of the government. According to announcement of PO (PO (2008)), government did not take into consideration enclosing school-teachers in the bill, and that the Prime Minister is "taken-aback" with this initiative. These facts let us conclude that PSL's ideal point on the issue was located closer to demands of Lewica and labor unions than to its coalitional

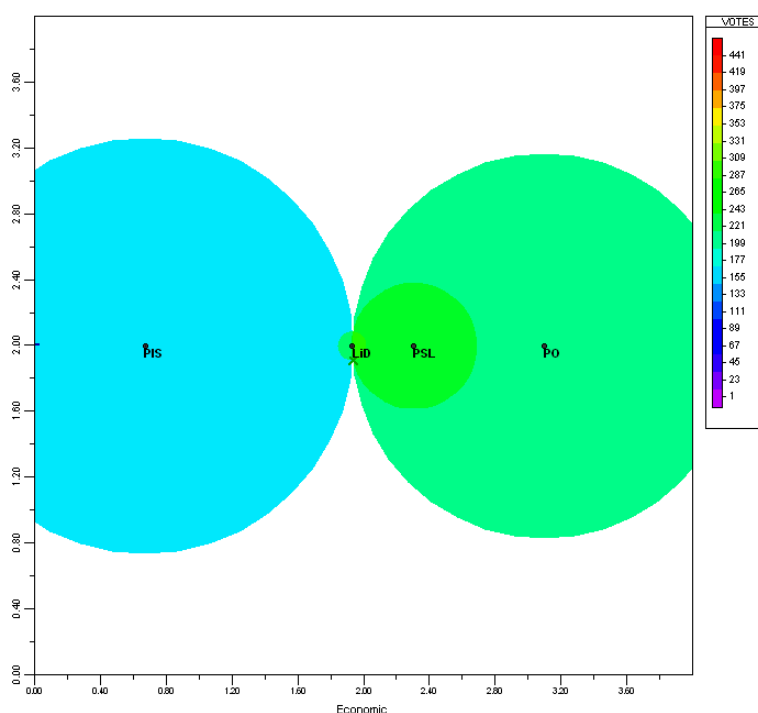


Figure 1.17: Voting on a proposal located at the Lewica's ideal point

partner bliss point.

1.6.2 Theoretical Predictions and the Actual Policy

As can be observed in Figure 1.14 any economic proposal located between the point equally distant from PO's and PSL's ideal points and the ideal point of Lewica should receive support of roughly 243-265 votes, which is enough to pass the proposed bill under the simple majority rule (in case all MPs were present), but not under the qualified majority of 3/5, under which assuming the presence of all members, 276 votes are needed.

It can be seen in Figures 1.17 and 1.18 that for a proposal to gain the majority required to overrule presidential veto it is necessary that it lies in a close proximity of the LiD's ideal point. The process of enactment of the early retirement bill clearly shows that this theoretical prediction coincide with the actual policy choice. The

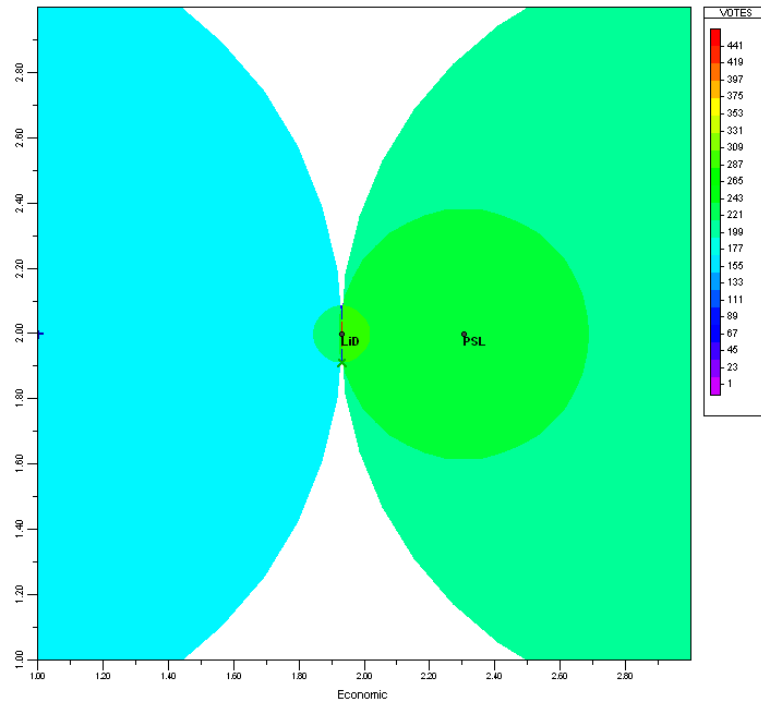


Figure 1.18: Voting on a proposal located at the Lewica's ideal point – close-up

first draft of the discussed law was a joint work of both coalitional partners and discussants in the Trilateral Commission, but it is clear that it represented the view of the larger party, which at first was reluctant to back down its view of the shape of the new law. Moreover, as discussed before the Minister of Labor and Social Policy from PSL tried to "push through" her version of the early retirement bill despite objections expressed in official statements of the government.

The final version of the law, includes a list of amendments proposed by both PSL and Lewica, and most importantly it encloses compensation schemes for school-teachers, size of which equals what this professional group would get, if it had been included in the discussed legal act. In this, the early retirement bill almost completely meets demands of Lewica and the labor unions that it represented. The three important features of the current political situation in Poland shape process of bills enactment, so that it well reflects theoretical predictions on

a basis of spatial theory. They are

- a *cohabitation*, which forces the coalitional government to seek support from one of the opposition parties,
- b central location of Lewica's ideal point along the economic dimension, and
- c distribution of seats in the parliament.

A major conclusion from this section is that non-Downsian behavior observed for LiD in Section 1.3 is again confirmed by its post-electoral impact on policy choice.

1.7 Conclusions

According to Lin et al. (1999) for "Downsian" parties, if each expected vote function is concave in each policy dimension, then a strong convergence to the mean of preferences should be observed. This means that all parties will adopt the same position, minimizing the distance between their position and voters' ideal points. However, Lin et al. (1999) also note that if variances are small, concavity conditions may fail and different Nash equilibriums can be found where parties will adopt different policy positions.

On the other hand, a study by Adams (1999) examined the effect of the β coefficient in an equation determining the utility on the basis of a spatial distance on Nash equilibrium under vote maximization. His study shows that for values of β that are close to zero, the Nash equilibrium is strongly convergent and located at the mean of the voter distribution. For $\beta \rightarrow \infty$ (the greater the value of β , the more "deterministic" the model becomes) a Nash equilibrium may not be possible in a more than one-dimensional policy space. In between there are

values of the spatial parameter for which a non-convergent equilibrium exists. Subsequent theorem of Schofield (2007) finds necessary and sufficient conditions for existence of local Nash equilibria, even if global concavity does not hold.

This paper aimed to determine whether spatial competition models – assuming Downsian behavior of participating political parties – are useful for describing the positions of political parties in Poland in the period preceding election in 2007 and whether theoretical prediction of spatial theory and cooperative game theory help predict formation of cabinet and policy choices during the period 2007–2010. The results are somewhat ambiguous.

We estimated a number of diverse specifications and found a common problem. Predicted probabilities correspond quite well with the actual results for the two smaller parties, but the model fails to predict vote shares for the PO and PIS parties. Observation of marginal effects suggests that pure spatial models lack some important non-spatial characteristics of Polish political parties. These may include the afore-mentioned impact of corruption scandals in the case of the LiD party or, as another example, the public perception of the PSL as a solely an agrarian party. However, it is very difficult to accurately portray these characteristics.

The estimated β coefficient for the MNP model equals .426 for the pure spatial model. Since theory for models with normal errors does not predict what exactly a small value of the coefficient means it is useful to compare this result with other studies that estimated pure spatial models. The study by Schofield and Sened (2005) for Israel predicts a value of coefficient equaling 1.739. For this value, the authors find two different non-convergent Nash equilibria. However, one must note that while these equilibria were found with the use of coefficient obtained from MNP model, the simulation was then conducted with the conditional logit

assumption, which assumes an independence property (IIA). In the case of close alternatives this may give incorrect results, but it is much easier to calculate. Schofield et al. (1998) conducted a study for Germany and the Netherlands using a multinomial probit. For Germany the estimated coefficient equals 0.239 and for the Netherlands it is 0.456. In case of both countries, the authors found that behavior is non-convergent.

A major advantage of using the MNP approach is that it allows for calculation of marginal effects of particular explanatory variables used in the regressions, which is not possible for the conditional logit. This gives us a deeper insight in the potential for strategic behavior of the analyzed parties, and we found confirmation of it for LiD and PSL.

Further on, we estimated valence models with conditional logit to be able to compare our empirical findings with theorems of Schofield (2007). We argue that because of high variance of errors in voters' behavior and what follows small value of the β coefficient convergence should be relatively strong, and stronger than predicted by Schofield et al. (2010a). Again we find confirmation for a non-Downsian placement of the LiD party. As for LiD, it is observed that its position is very distant from the electoral axis along the religious dimension. Since no reasonable alternatives exist in the secular part of the political space, it would be rational for the LiD to move towards the center in order to try to catch votes of liberal-democratic oriented voters, at least if it did not fear alienation. On the other hand, the LiD is the party that had the most to gain from coalitional bargaining. It was clear even before the election that if the PO and the PSL parties did not obtain at least 3/5 of votes in total, they would need another partner in order to overrule the presidential veto. The LiD party, who may have predicted their potentially pivotal role in the forthcoming parliament, could take

advantage of this position of power. Strategically, this would mean moving away from the political center in order to increase the size of the heart and to include in it policy points close to the ideal point of the LiD.

These primary findings are illustrated with the post-electoral coalitional findings and the case study of act on early retirement. Analysis of the actual policy choice as compared to game-theoretical predictions of locations of the heart, Copeland winner and Schattschneider sets, shows that strategic behavior of LiD is most probable. The analysis also confirms that because of the *cohabitation* situation in which coalition is forced to seek additional support from Lewica, the actual policy chosen lies very close to Lewica's ideal point, as predicted by theoretical concepts and what explains non-Downsian positioning that was found.

As already noted, spatial models are not entirely useful in predicting actual electoral results, because of the low turnout. In order to address this issue we conducted a formal analysis of turnout determinants to find that potential voters of PIS did not take part in the 2007 election. In this, we conclude that a strong sense of disappointment associated with this party could have resulted in lower valence for PIS, if these electors were included in the analyzed sample.

1.8 Appendix A

The constitutional system in Poland

Poland is ruled by a parliamentary system of government. The basic formulation of this type of governing system was first introduced by the French Third Republic constitution in 1875. The basics of the system in which the executive branch is designated by the head of state and at the same time must be supported by the parliament are present, but the Polish parliamentary system reveals some particular characteristics which make it a bit different from the standard model and are well worth describing. Poland's history and its parliamentarianism have both played a role in shaping these characteristics.

The current governing system in Poland was formed by the constitution of 1997. This replaced the temporary amendments put into place in 1992, which were designed to transform Poland from a single- to a multi-party system and from socialism into a free market economy. It is based on a bicameral parliament . the National Assembly, whose term of office equals 4 years. The lower chamber is called the Sejm, whereas the upper chamber is the Senate. The constitution stipulates the possibilities for extending a term of office in case of an emergency state, and also details the possibilities for shortening it in certain specific situations. One such situation is if two-thirds of the Sejm elect to dissolve parliament (if this happens, then Senate is automatically disbanded). A second situation that can lead to parliamentary dissolution arises if parliament does not submit the Budgetary Act for approval by the president within a particular time. The last enumerated situation is the most important for the purposes of this work. Parliament may be disbanded if it is unable to form a government or to give a vote

of confidence to the government proposed by the President. In the latter case, the constitution foresees and does not permit the possibility of endless coalition bargaining that could prevent a government from ever forming.

The elections to Sejm can be described by five characteristics: they are universal suffrage, proportional, equal, direct and anonymous (that is, they are conducted by a secret ballot). Deputies are elected in 41 electoral districts, 7 to 19 members from a closed list in each. The total number of members equals 460. A d'Hondt formula is currently used to divide the seats. In 1991 the Hare–Niemeyer formula was used, and in 2001 the modified Saint–Lague method. The latter way of transforming the number of votes into seats is more proportional and it allows for a close ratio of votes to seats received, whereas the d'Hondt method encourages larger parties to obtain more seats. Furthermore, the system sets a particularly high threshold of votes needed for seats: 5% for parties and 8% for coalitions. One reason for this set-up might be the fragmentation of the Polish political scene ⁶, which though diminishing still appears to determine the shape of Polish governments. This particular characteristic of Polish parliamentarianism seems to have a big influence on election results. In the upper chamber, senators are chosen in universal suffrage, direct and proportional elections under relative majority rule in 40 electoral districts, up to a total of 100 members. It should be noted that although the parliament is bicameral, the rights of the Senate are very weak. Among the entitlements relevant to this paper, one needs to only to note that the Senate may reject or amend the bills passed by the Sejm but any rejection or amendment may still be overruled by an absolute majority vote in the Sejm. In this sense, the role of the Senate in forming legislative acts is minor

⁶In the first free election in 1991, 29 different parties received seats. 11 of these parties received just one seat.

and focuses mainly on correcting mistakes in bills enacted by the lower chamber.

The president of Poland is elected in a universal suffrage, direct, equal and anonymous election. This gives the president an unusually strong mandate not often encountered in other parliamentary systems across Europe. Among the entitlements of the president, one may distinguish between prerogatives and actions that require a countersign of a competent minister. Among the presidential prerogatives it is important to cite both the right of legal initiative and the right to veto bills proposed by the parliament, which can be overruled by a $\frac{3}{5}$ majority of Sejm members. The president's strong public mandate and veto ability can and does lead to situations where a simple or even absolute majority may be insufficient to pass a bill, especially in a cohabitation situation, in which the president (though formally s/he cannot be a member of any party) for all intents and purposes represents the views of the opposition. The president may also convene a referendum after obtaining the assent of the Senate. One must bear these presidential entitlements in mind in order to properly analyze coalition bargaining in Poland.

The president designates the executive in a form of a cabinet, but the cabinet must enjoy the confidence of the Sejm. One constitutional exception to this rule is when the Sejm chooses ministers, and the members are afterwards appointed by the president. The latter situation occurs if the Prime Minister designated by the president is unable to form a government that would receive a vote of confidence from the Sejm by absolute majority in the presence of at least half of the representatives. If the second procedure also fails, the right of the indication of a Prime Minister goes back to the president, and the first step is repeated; however, a simple majority of votes is sufficient to achieve a vote of confidence. If after this procedure it is still impossible to form a cabinet, new elections must

be convened. The coalitional bargaining process has been thus restricted in order to ensure a continuity of governance. Among its rights the cabinet also holds the right of initiative.

Formation of the Political Scene in Poland

Before further analysis, it is important to understand how certain historical events have impacted specific aspects of Polish politics. Trade unions had a crucial historical influence on governance, especially with regards to the Solidarity movement in Poland's transition from a single-party authoritarian regime to a democratic system. This situation, improper from a democratic point of view, is now overruled by the constitution, which says (Art. 100 §1) that "Candidates for Deputies and Senators may be nominated by political parties or voters", a contrario not by the trade unions.

Another important feature of Polish politics is a distinction between the left and the right. Left-wing parties are for the most part against the involvement of the Catholic Church in Polish politics, and they do not question the accomplishments of the People's Republic of Poland (this was the official name of the country from 1952 to 1989, when it was ruled by the communist Polish United Workers Party). On the other hand, the right-wing parties, usually connected with the Solidarity movement, refer to national traditions, support the Catholic Church's involvement in politics, and discard the accomplishments of the previous regime. Though the described division has become weaker, it still more or less dictates the shape of Polish politics. However, in the 2007 and 2005 elections the political competition focused on two right-wing, post-Solidarity parties and the left or post-communists played a rather minor role.

Major Political Parties in Poland

Four of the political parties in contemporary Poland were able to obtain seats in the current parliament:

The Civic Platform (Platforma Obywatelska) - The Civic Platform was founded in 2001. It mainly consists of liberal ex-members of the Solidarity Electoral Action party (Akcja Wyborcza Solidarność) and Union for Freedom party (Unia Wolności) which from 1997 to 2001. The Civic Platform is a Christian-democratic and liberal-conservative political party, combining liberal stances on the economy with conservative stances on social and ethical issues, including opposition to abortion, gay marriage and euthanasia. Among their main proposals flat tax, fast privatization, decentralization and labor law liberalization shall be cited in this study. The party's attitude towards the European Union is moderately enthusiastic. In the European Parliament this party is part of the European People's Party.

The Polish People's Party (Polskie Stronnictwo Ludowe) - Founded in 1990, it is considered an agrarian centrist party. The name of the party has a century-old history and it was one of the most important parties in the 1920–1939 period. However, these days the members of the new Polish People's Party come mainly from the ex-communist United People's Party which was strongly associated with the old regime. Because of this, prior to 2003 its program was rather left-wing with a focus on agricultural issues. However, after quitting their coalition with the Democratic Left Alliance Party they have moved towards the center of the political scene. It cannot be forgotten that rural areas are one of the main beneficiaries of Poland's accession to the European Union. In the European Parliament this party

is a member of the European People's Party.

Law and Justice (Prawo i Sprawiedliwość) – This party was established in 2001 by the Kaczyński brothers; Lech, the President of Poland who died recently, and Jarosław, the current party president. Most of the present party members were associated with the conservative and socialist parts of the Solidarity Electoral Action Party. It has built its political strength mostly through leading a "crusade" against political corruption. (Previously, Lech Kaczyński was the Chairmen of the National Control Chamber as well as the Minister of Justice). The party is considered to be social-national-conservative. Their platform includes support for state intervention in the economy, centralization, restricting monetary policy independence, enforcing stronger penalties for criminals, and finally constitutional reform in order to strengthen the role of the President. It's attitude to the European Union is rather skeptical. In the European Parliament they are a member of the European Conservatives and Reformists.

Democratic Left Alliance (Sojusz Lewicy Demokratycznej) - The biggest party of those forming a parliamentary group Left and Democrats (Lewica i Demokraci; under name Lewica since 2008) consisting also of: Social Democracy of Poland (SDPL), Labour Union (UP) and the Democratic Party (PD). A social democratic party. Initially it was a direct descendant of the communist Polish United Workers. Party - the ruling party from 1948 to 1989. The name was used for a coalition of left-wing parties from 1991 to 1999. It was formally established as a single party on April 15, 1999. In late 2006, it joined the Left and Democratic Parties, an alliance of center-left social liberal parties. In the early 90's they abandoned their

back-to-communism message and switched to supporting social democracy. This party represents a modern social-democratic program modeled on the Labour Party or SDP. In 2001–2003 the then-governing Prime Minister along with the party's chairman Leszek Miller implemented market-oriented reforms which together with numerous corruption scandals ruined the party's popular image. However, it has a staunch group of supporters which can be estimated as comprising 10% of eligible voters. The party is enthusiastic about the European Union. In the European Parliament this party is a member of the Progressive Alliance of Socialists and Democrats.

1.9 Appendix B

Table 1.20: The logit model of turnout – results

Dependent variable	Voting	
	Coefficient ^a	z-Stat.
Sense	0.03	(0.47)
Town	-.91	(-0.41)
Education	.12	(2.04)**
Interest	.21	(1.52)
Internet	0.11	(0.37)
MALE = 1	.39	(1.84)**
Age	.09	(2.49)**
Age ²	-.01	(-1.98)**
Vote 2005 = 1	1.38	(5.68)***
Prob LiD	-9.57	(-1.36)
Prob PIS	-6.42	(-2.28)**
Prob PO	-1.99	(-0.37)
Prob PSL	2.00	(0.19)
Labor Union	-.05	(-0.14)
Income	.00	(0.18)
Wald χ^2 p-value	0.00	
No. of observations	587	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

Table 1.21: Alienation hypothesis – t-Test Results

Education = 1		
	Mean	Std. Dev.
Abstainers	1.503	.073
Voters	1.443	.148
Combined	1.473	.075
Difference	.059	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.63$ $P(T > t) = 0.73$ $P(T > t) = 0.36$		
Education = 2		
	Mean	Std. Dev.
Abstainers	.844	.063
Voters	.923	.041
Combined	.895	.034
Difference	-.078	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.14$ $P(T > t) = 0.28$ $P(T > t) = 0.85$		
Education = 3		
	Mean	Std. Dev.
Abstainers	.758	.090
Voters	.613	.145
Combined	.694	.080
Difference	.145	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.79$ $P(T > t) = 0.40$ $P(T > t) = 0.20$		
Education = 4		
	Mean	Std. Dev.
Abstainers	.932	.050
Voters	.803	.035
Combined	.849	.029
Difference	.128	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.98$ $P(T > t) = 0.03$ $P(T > t) = 0.01$		

Table 1.22: Alienation hypothesis – t-Test Results

Education = 5		
	Mean	Std. Dev.
Abstainers	.637	.188
Voters	.544	.124
Combined	.585	.102
Difference	.093	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.66$ $P(T > t) = 0.67$ $P(T > t) = 0.33$		
Education = 6		
	Mean	Std. Dev.
Abstainers	.774	.058
Voters	.762	.058
Combined	.766	.044
Difference	.011	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.54$ $P(T > t) = 0.90$ $P(T > t) = 0.45$		
Education = 7		
	Mean	Std. Dev.
Abstainers	.698	.049
Voters	.703	.028
Combined	.702	.024
Difference	-.005	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.45$ $P(T > t) = 0.91$ $P(T > t) = 0.54$		
Education = 8		
	Mean	Std. Dev.
Abstainers	.792	.088
Voters	.847	.089
Combined	.834	.070
Difference	-.055	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.37$ $P(T > t) = 0.74$ $P(T > t) = 0.62$		

Table 1.23: Alienation hypothesis – t-Test Results cont'd

Education = 9		
	Mean	Std. Dev.
Abstainers	.800	.131
Voters	.694	.089
Combined	.721	.073
Difference	.105	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.72$ $P(T > t) = 0.55$ $P(T > t) = 0.27$		
Education = 10		
	Mean	Std. Dev.
Abstainers	.970	.101
Voters	.693	.063
Combined	.752	.056
Difference	.276	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.97$ $P(T > t) = 0.04$ $P(T > t) = 0.02$		
Education = 11		
	Mean	Std. Dev.
Abstainers	.789	.055
Voters	.682	.038
Combined	.703	.033
Difference	.107	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.90$ $P(T > t) = 0.19$ $P(T > t) = 0.09$		

Table 1.24: Indifference hypothesis – t-Test Results

Education = 1		
	Mean	Std. Dev.
Abstainers	2.075	.190
Voters	2.164	.083
Combined	2.119	.095
Difference	-.089	
H_a : Difference < 0 H_a : Difference $\neq 0$ H_a : Difference > 0 $P(T < t) = 0.34$ $P(T > t) = 0.69$ $P(T > t) = 0.65$		
Education = 2		
	Mean	Std. Dev.
Abstainers	2.035	.058
Voters	1.819	.055
Combined	1.895	.042
Difference	.215	
H_a : Difference < 0 H_a : Difference $\neq 0$ H_a : Difference > 0 $P(T < t) = 0.99$ $P(T > t) = 0.01$ $P(T > t) = 0.00$		
Education = 3		
	Mean	Std. Dev.
Abstainers	1.425	.296
Voters	1.677	.382
Combined	1.537	.225
Difference	-.251	
H_a : Difference < 0 H_a : Difference $\neq 0$ H_a : Difference > 0 $P(T < t) = 0.30$ $P(T > t) = 0.61$ $P(T > t) = 0.69$		
Education = 4		
	Mean	Std. Dev.
Abstainers	1.924	.056
Voters	1.851	.047
Combined	1.877	.036
Difference	.072	
H_a : Difference < 0 H_a : Difference $\neq 0$ H_a : Difference > 0 $P(T < t) = 0.82$ $P(T > t) = 0.34$ $P(T > t) = 0.17$		

Table 1.25: Indifference hypothesis – t-Test Results

Education = 5		
	Mean	Std. Dev.
Abstainers	1.844	.275
Voters	1.966	.141
Combined	1.912	.136
Difference	-.121	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.34$ $P(T > t) = 0.68$ $P(T > t) = 0.65$		
Education = 6		
	Mean	Std. Dev.
Abstainers	1.811	.112
Voters	1.828	.064
Combined	1.823	.056
Difference	-.017	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.44$ $P(T > t) = 0.88$ $P(T > t) = 0.55$		
Education = 7		
	Mean	Std. Dev.
Abstainers	1.924	.057
Voters	1.779	.045
Combined	1.822	.036
Difference	.144	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.96$ $P(T > t) = 0.07$ $P(T > t) = 0.03$		
Education = 8		
	Mean	Std. Dev.
Abstainers	1.782	.216
Voters	1.790	.097
Combined	1.788	.088
Difference	-.008	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.48$ $P(T > t) = 0.96$ $P(T > t) = 0.51$		

Table 1.26: Indifference hypothesis – t-Test Results cont'd

Education = 9		
	Mean	Std. Dev.
Abstainers	2.041	.265
Voters	1.665	.150
Combined	1.759	.132
Difference	.375	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.88$ $P(T > t) = 0.23$ $P(T > t) = 0.11$		
Education = 10		
	Mean	Std. Dev.
Abstainers	1.264	.189
Voters	1.748	.092
Combined	1.644	.087
Difference	-.483	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.01$ $P(T > t) = 0.02$ $P(T > t) = 0.98$		
Education = 11		
	Mean	Std. Dev.
Abstainers	1.764	.101
Voters	1.673	.052
Combined	1.691	.046
Difference	.090	
H_a : Difference < 0 H_a : Difference $\neq$ 0 H_a : Difference > 0 $P(T < t) = 0.77$ $P(T > t) = 0.44$ $P(T > t) = 0.22$		

Table 1.27: The MNP voter-specific model results

Party	Choice	Coef.	S.E.	z	$P > z $	95% Conf. Interval
	distance	-.403***	.028	-14.17	0.000	-.459 -.347
PIS		(base alternative)				
PO	Town	.091***	.012	7.86	0.000	.068 .113
	Education	.037***	.008	4.41	0.000	.020 .053
PSL	Town	-1.02***	.313	-3.26	0.001	-1.63 -.406
	Education	.151	.160	0.94	0.347	-.164 .465
LiD	Town	-.070***	.016	4.38	0.000	.039 .101
	Education	.016	.010	1.56	0.118	-.004 .037
		Wald $\chi^2 = 818.99$				
		$P > \chi^2 = 0.000$				

Chapter 2

Estimation of Party Positions: A Comment on Schofield and Zakharov (2010)

2.1 Introduction

Schofield and Zakharov (2010) in their recent publication present results of the application of the mean voter theorem (Schofield (2007)) to the Russian Duma elections of 2007. Using valence estimates from the multinomial logit model, Schofield and Zakharov (2010) predict local Nash equilibrium (LNE) positions of the parties. To construct such an empirical model a researcher needs to have knowledge about the ideological positions of both voters and parties. Ascertaining the ideological positions of parties and in particular how these platforms are perceived by the voters, is a vast methodological problem. Several approaches have been proposed in the literature. Benoit and Laver (2006) suggest the use of expert surveys, while other studies make use of party manifestos (Gabel and

Huber (2000), Budge et al. (2001)) or their own expert judgement.

Schofield and Zakharov (2010) assume that parties' positions reflect the mean preferences of their respective electorates. In this comment we show that the latter approach is misleading. In particular, we show that the choice of a method of measuring ideological positions of parties influences the estimates of equilibrium positions and other conclusions drawn from the model. Using the same dataset of voters' ideal points and electoral decisions, we find that estimation with declared positions leads to a conclusion of a likely convergence whereas estimation with mean preferences of the electorate as a proxy for parties' positions results in strong evidence for divergence. We argue that the latter approach is inappropriate in the probabilistic voting set-up.

2.2 The Model

Let us briefly restate the assumptions and findings of Schofield (2007). Each of the parties, in the set $P = \{1, \dots, j, \dots, p\}$ chooses a policy, $z_j \in X$, to declare to the electorate prior to the election, where X is an open convex subset of Euclidean space, R^w , with w finite. Formally, the utility of voter i is given by

$$u_{ij} = \lambda_j - \beta \|x_i - z_j\|^2 + \varepsilon_{ij}, \quad (2.1)$$

where λ_j is the valence of party j , x_i is the ideal point of the voter, z_j is the party policy (declared before the election takes place) and ε_{ij} is the stochastic error. This error term captures the uncertainty about voters' decisions on the side of the parties. $\{x_i \in X\}_{i \in N}$ is the set of voter ideal points for the members of the electorate, N , of size n . It is assumed that valences are exogenous and can

be ranked, so that $\lambda_p > \lambda_{p-1} > \dots > \lambda_1$. The cumulative distribution of the error terms is assumed to be C^2 -differentiable, so that the individual probability functions ρ_{ij} will also be C^2 -differentiable in the strategies z_j and the vote shares defined as

$$V_j(z) = \frac{1}{n} \sum_{i \in N} \rho_{ij}(z) \quad (2.2)$$

are also C^2 -differentiable. It is further assumed that the joint distribution of the error term is the Type I extreme value distribution.

Schofield (2007) defines an equilibrium concept – a Local Nash Equilibrium (LNE) as below.

Definition 5 *A strategy vector $\mathbf{z}^*$ is a local Nash equilibrium iff, for each party $j \in P$, there exists a neighborhood X_j of z_j^* in X such that*

$$V_j(z_1^*, \dots, z_j^*, \dots, z_p^*) \geq V_j(z_1^*, \dots, z_j, \dots, z_p^*) \quad \text{for all } z_j \in X_j. \quad (2.3)$$

This definition does not rely on the global concavity of voters' probabilities functions, but the LNE is defined as a local maximum of the vote share function, given the positions of all other parties. The following definitions are needed to present the main theorem of Schofield (2007)¹.

Definition 6 *The electoral covariance matrix.*

- 1 *The electoral covariance matrix is $\nabla^* = \frac{1}{n} \nabla$, where $\nabla = [(\xi_s, \xi_t)]_{w \times w}$ and $\xi_t = (x_{1t}, x_{2t}, \dots, x_{nt}) \in R^n$ is the vector of the t -th coordinates of the set of the n voters' ideal points and $(\cdot)$ denotes a scalar product.*

¹Additional minor assumptions are necessary to prove the following theorem. Please refer to Schofield (2007) for details.

2 The total electoral variance is

$$v^2 \equiv \sum_{r=1}^w v_r^2 = \text{tr}(\nabla^*), \quad (2.4)$$

where w is the dimensionality of the issue space.

Definition 7 The convergence coefficient of the valence model.

1 Define

$$\rho_j \equiv \left[1 + \sum_{k \neq j} \exp(\lambda_k - \lambda_j) \right]^{-1}. \quad (2.5)$$

2 The coefficient A_j for party j is

$$A_j = \beta(1 - 2\rho_j). \quad (2.6)$$

3 The characteristic matrix for party j is

$$C_j = [2A_j \nabla^* - I_{w \times w}]. \quad (2.7)$$

4 The convergence coefficient of the model is

$$c = 2\beta(1 - 2\rho_1)v^2 = 2A_1v^2, \quad (2.8)$$

where valence is ranked, so that $j = 1$ denotes the party with the lowest valence.

For the joint origin² to be a LNE the following conditions, as given by Theorem 2, must be met.

²We first transform coordinates so that in the new coordinates, $x^* = 0$. We shall refer to $z_0^* = (0, \dots, 0)$ as the joint origin in this new coordinate system.

Theorem 2 (*Schofield, 2007*) *The joint origin satisfies the first-order necessary condition for a LNE for the valence model. The second-order necessary condition for the joint origin to be a LNE is that every eigenvalue of the characteristic matrix $C_1 = [2A_1\nabla^* - I]$ is negative.*

The first-order necessary condition for the joint origin to be a LNE (which is always fulfilled whenever valence is determined exogenously) is provided in Schofield (2006). Intuitively a LNE at the joint origin is less likely, the greater are parameters β , v^2 and $\lambda_p - \lambda_1$.

Corollary 2 *In the two-dimensional case, a sufficient condition for the joint origin to be a LNE for the valence model is that $c < 1$.*

The intuition behind Theorem 2 is easy to follow. The second-order necessary condition simply states that the local Nash equilibrium at the joint origin is possible, if it is a local maximum of the vote share function. The value of the β parameter has a straightforward interpretation: the higher it is, the more 'deterministic' the behavior of voters is. In other words, for higher β , the spatial distance is a more important component of the utility. As shown already by Adams (1999), for low values of β , policies are more convergent and an equilibrium located at the mean of the preferences' distribution is expected. If β is sufficiently high, we can no longer hope for a global Nash equilibrium, but a divergent Local Nash Equilibrium can be found.

If voters are uninformed and unable to assess the parties' positions correctly, or they misperceive them on a basis of e.g. previous experiences³, this will be

³In Chapter 1, we show that market-oriented reforms introduced in years 2001-2003 by the social-democrat party SLD in Poland, still affected perception of this party's economic stance in the 2007 elections.

reflected by the increased error component of the empirically estimated utility function and will negatively impact the value of β .

The crucial part of the estimation is the choice of observations for z_j . Schofield and Zakharov (2010) assume that the parties are located at the mean preferences of their respective electorates. This implies a high degree of certainty in parties' inference of voters' ideal points as it contains an implicit supposition that the parties almost certainly know who will vote in their favor *before* the election takes place. Formally, the assumption of Schofield and Zakharov (2010) about the position of party j is

$$z_j = \frac{1}{n_j} \sum_{i \in N_j} x_i, \quad (2.9)$$

where $\{x_i \in X\}_{i \in N_j}$ is the set of voter ideal points for the members of the electorate, N_j of party j , of size n_j . To adopt such a platform, a party j should know the set of indices N_j before the election takes place. In other words, such a perfect positioning is only possible if the error term incorporated in the utility of voters is negligible i.e. the model is (almost) deterministic. Thus, this operational assumption of certainty about the future undermines the conceptual premises about uncertainty built into the theory of probabilistic voting itself (see, e.g. Budge (1994) for a further discussion of uncertainty in spatial models).

As we show in the next section, the choice of method for measuring party positions has a major influence on the predictions drawn from the model. In particular, we show that the methodology chosen by Schofield and Zakharov (2010) leads to predictions suggesting divergence from the joint origin, which is understandable in light of the above arguments.

2.3 Results

In order to show the severity of the impact of using mean preferences as a proxy for parties' platforms, we compare the results of two valence models estimates using data on the Polish parliamentary elections of 2007. As 'declared positions' we use information obtained directly from parties' spokespersons, whom we asked to answer questions about their party's stance on key economic and social issues. A detailed description of the issues and the procedure of factor analysis that identified two dimensions of policy can be found in Chapter 1. In cases where no data were obtained directly, we used information published in parties' manifestos. Figure 2.1 and Table 2.1 present a comparison of the declared positions of the parties and the positions calculated as the mean preferences of the respective electorates.

Table 2.1: Declared Positions vs Mean Electorate Preference

Party	Positions		Mean Electorate	
	Economic	Religious	Economic	Religious
PIS	-1.32	0.36	-1.42	0.09
PO	1.09	0.53	-0.73	0.21
PSL	0.30	0.54	-1.13	0.11
LiD	-0.07	-1.44	-0.77	0.09

There is a striking discrepancy between the presented values, especially in the religious dimension⁴. This result suggests that either voters make a substantial error in the perception of parties' positions or that the impact of ideology on their electoral decisions is low. In both cases, the effect of using mean preference proxies as party positions will result in an upward bias of the β parameter. In

⁴Equal stance on social issues of the PIS and LiD parties seems particularly problematic as these two, according to political studies of Polish politics, represent far opposite views on key social issues. See e.g. Benoit and Laver (2006) for expert survey estimates of these parties' positions in 2004.

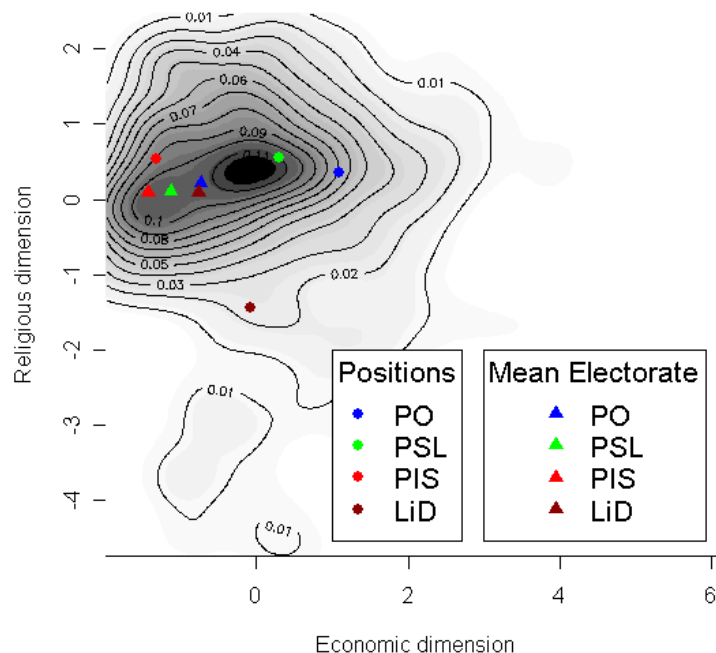


Figure 2.1: Actual positions and mean preferences of respective electors

Table 2.2 we show estimates of the spatial distance parameter (β) and valences, calculated using party declarations, as compared to mean electorate preferences.

As expected, the estimate of β obtained using mean preferences is much higher, indicating that the model is much more 'deterministic'. Thus, using this estimate further on to calculate characteristic matrices and making predictions about equilibrium positions will imply a bias towards divergence. Comparison of log likelihoods for the two models, does not give any insight about which should be considered superior. Referring back to the first column of Table 2.2, we find that the lowest valence party is the PSL and that the β coefficient equals 0.470. The covariance matrix of voters' positions is

Table 2.2: The MNL valence model results - comparison

Party	Choice	Positions		Mean Electorate	
		Coef. ^a	z-Stat.	Coef.	z-Stat.
	Spatial Distance (β)	.470***	(6.18)	1.389***	(7.74)
PIS		(base)		(base)	
PO	Valence (λ_{PO})	0.665***	(4.75)	.126	(1.27)
PSL	Valence (λ_{PSL})	-1.088***	(-6.66)	-1.371***	(-8.96)
LiD	Valence (λ_{LiD})	-.619***	(-3.83)	-1.070***	(7.63)
Log likelihood		-681.05		-669.33	
No. of obs.		579			

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

$$\nabla_0^* = \begin{bmatrix} 0.983 & 0.071 \\ 0.071 & 0.351 \end{bmatrix}$$

and the characteristic matrix for the PSL party is

$$\rho_{PSL} \simeq \frac{1}{1 + \exp(1.088) + \exp(1.088 + 0.665) + \exp(1.088 - 0.619)} \simeq 0.096$$

$$C_{PSL} = (2 \cdot 0.470 \cdot (1 - 2 \cdot 0.096)) \begin{bmatrix} 0.983 & 0.071 \\ 0.071 & 0.351 \end{bmatrix} - I = \begin{bmatrix} -0.253 & 0.054 \\ 0.054 & -0.734 \end{bmatrix}$$

The eigenvalues of the C_{PSL} matrix are -0.247 and -0.740 for the economic and religious dimension respectively. The corresponding eigenvectors are

$\begin{pmatrix} -0.994 \\ -0.110 \end{pmatrix}$ and $\begin{pmatrix} -0.110 \\ 0.994 \end{pmatrix}$. The overall convergence coefficient is

$$c = 2\beta(1 - 2\rho_{PSL})\text{trace}(\nabla^*) = 2 \cdot 0.380 \cdot (0.983 + 0.351) = 1.014.$$

Both eigenvalues of the characteristic matrix are negative, indicating that the vote share functions are concave at the joint origin, and it follows that the necessary condition of Schofield (2007) is fulfilled. The sufficient condition is not fulfilled, as the value of c is slightly larger than 1. This might be the result of computational inaccuracy and suggests that convergence is still highly likely. The corresponding eigenvectors represent the axes along which the eigenvalues show the direction of movement. In the case above, we note that along both axes the gradient points towards the joint origin.

Let us now compare the above findings with the results obtained from the model in which we used the mean preferences of the respective electorates as approximations of the ideological positions of the parties (denoted with asterisk). The estimate of β^* is 1.389, which is, as expected, much higher than in the first model. The respective coefficients' values are

$$\rho_{PSL}^* \simeq 0.102$$

$$C_{PSL}^* = \begin{bmatrix} 2.174 & 0.157 \\ 0.157 & 0.776 \end{bmatrix}$$

The eigenvalues of this characteristic matrix are 1.1914 and -0.2414 . The overall convergence coefficient equals

$$c^* = 2\beta^*(1 - 2\rho_{PSL}^*)\text{trace}(\nabla^*) = 2 \cdot 1.106 \cdot (0.983 + 0.351) = 2.950 > 1.$$

Comparing with theorem 2, we see that the necessary condition fails, since the first eigenvalue is positive, which means that the joint origin is a saddle-point. Along the main electoral axis i.e. the first eigenvector (corresponding to the economic dimension), the gradient points outwards and we should observe divergence from the joint origin. The sufficient condition also fails, as the value of the convergence coefficient is higher than 1.

2.4 Conclusions

We have shown that the choice of method of measuring the party positions may be a crucial factor which determines the conclusions drawn from the model. The choice of mean preferences as a proxy implies a high degree of certainty on the part of voters about the ideologies of parties and vice-versa. We argue that this assumption contradicts the idea of probabilistic voting and moreover does not seem to be realistic. Hence we conclude that the estimates of equilibrium positions derived from the results of Schofield and Zakharov (2010) are not credible.

Chapter 3

Campaign Finance Regulations and Policy Convergence: The Role of Interest Groups and Valence

3.1 Introduction

In an ideal democracy, public policy is guided by the will of the people and the "one man, one vote" principle. In reality, policies are diverted away from the will of electors towards representing interests of only certain groups of the society. Parties need to spend large amounts of money for campaign activities and the incentive to gain financial means from various sources is increasing. The main aim of campaign finance regulation is to make income and expenditure of parties more transparent for both the regulatory authorities and the public and to decrease the incentive to seek financial sources that could distort their political

agenda. As argued by Grossman and Helpman (2001), preventing parties from distorting their policy choices can raise aggregate welfare.

In this paper we make a first attempt to test empirically the impact of diverse campaign financing institutions on placement of parties in a spatial model of competition. Anticipating our results, we state that the limit on individual contributions is associated with convergence of platforms, whereas other commonly found institutions, such as direct public funding, the public disclosure of income statements as well as ban on corporate donations lead to adoption of more radical positions.

In this work, we link diverse strands of literature: theoretical predictions about party positions, literature on diverse campaign finance regulations and empirical work, which established that campaign expenditure does have effect on increasing vote shares. The link is established by the term 'valence', which loosely speaking comprises all the non-spatial characteristics of parties. The fact that, there exists no empirical work linking campaign finance provisions and policy positions constitutes the main motivation for this study.

We base our analysis of policy convergence on theoretical predictions of Schofield (2007) and Ashworth and Bueno de Mesquita (2009), who find that bigger differences in valence among competing parties should result in more divergent positions in the issue space as well as on the broad literature analyzing the impact of special interests on parties' platforms.

The theoretical literature on different campaign finance institutions is broad. With regard to public funding, it is usually argued that replacing "tainted money" from interest groups with tax-financed "clean money" leads to voters' welfare improvement while it dampens incentives to offer non-policy favors to contributors. Moreover, it encourages better representation of voters' preferences, unlike the

private funding system in which parties need to satisfy ideological preferences of only certain groups of the society (see e.g. Coate (2004a), Ashworth (2006)). However, it might be the case, that public financing serves as a device to freeze party competition and exclude new competitors, whereas these could improve on preferences representation or be of better quality (see, Scarrow (2006), Coate (2004b)). The above statements are intuitive, but have yet not been tested in a formal way.

Most of the theoretical work assessing the impact of campaign expenditure has stressed the informational aspect of campaigning (see, e.g. Coate (2004b)). For the purpose of this study important theoretical insights have been provided by Coate (2004a) who finds that evaluations of the candidates are influenced by voters' beliefs about the sources of income at politicians' disposal. More precisely, a rational voter would evaluate the quality of a candidate (or a party) as lower if he expects that he (it) is involved in bargaining with interest groups. These findings have also been confirmed by recent experimental results of Houser and Stratmann (2008).

There exists also a well-established empirical literature, on how diverse campaign financing rules affect election outcomes. Stratmann (2006a) analyzes the role of contribution limits on closeness of elections, to find that limits on contributions narrow the margin of victory. Moreover, Stratmann (2006b) tests whether campaign expenditures by state House candidates are more productive in increasing vote shares when candidates run in states that limit contributions. The results show that campaign expenditures are more productive when candidates run in states with campaign contribution limits, which suggests a positive impact of the transparency of income sources on valence creation. Furthermore, in states with contribution limits, incumbent and challenger spending are equally productive,

and spending by both candidates is quantitatively important in increasing their vote shares.

The number of empirical studies regarding positions of parties dependent on their valences is limited. Recent work of Stone and Simas (2010) finds that incumbents with a valence advantage place themselves closer to their district medians, while disadvantaged challengers take the more extreme policy positions. This is consistent with the theoretical findings of Schofield (2007). Clouse (2007) analyzes the 2004 US presidential primaries and similarly finds that there is a negative relationship between valences of candidates and their ideological proximity on the key political issues. We are not aware of any empirical work of this kind for multiparty systems.

In the next section we briefly describe findings of Schofield (2006) and Schofield (2007). In Section 3.3 we describe sources of data and the methodology, in particular concentrating on the practical aspects of campaign finance law. In addition, on the basis of the theoretical predictions we formulate hypotheses on the impact of diverse campaign finance institutions on the policy convergence. In Section 3.4 we present the results of our empirical study. Section 3.5 concludes and discusses methodological concerns involved.

3.2 Theoretical Predictions

3.2.1 The Role of Valence and Special Interests

Let us here briefly restate assumptions and findings of Schofield (2007). Each of the parties, in the set $P = \{1, \dots, j, \dots, p\}$ chooses a policy, $z_j \in X$, to declare to the electorate prior to the election, where X is an open convex subset of Euclidean

space, R^w , with w finite. Formally, the utility of a voter is given by

$$u_{ij} = \lambda_j - \beta ||x_i - z_j||^2 + \varepsilon_{ij}, \quad (3.1)$$

where λ_j is the valence of party j , x_i is the ideal point of the voter, z_j is the party policy (declared before the election takes place) and ε_{ij} is the stochastic error (for each voter assumed to be drawn from the same probability distribution). It is assumed that valences are exogenous and can be ranked $\lambda_p > \lambda_{p-1} > \dots > \lambda_1$. The cumulative distribution of the error terms is assumed to be C^2 -differentiable, so that the individual probability functions ρ_{ij} will also be C^2 -differentiable in the strategies z_j and what follows vote shares V_j defined as

$$V_j(z) = \frac{1}{n} \sum_{i \in N} \rho_{ij}(z) \quad (3.2)$$

are also C^2 -differentiable. ρ_j is the individual probability of voting for j and n denotes the cardinality of the set of voters N .

The mean voter theorem of Lin et al. (1999) shows that the joint mean vector $\mathbf{z}^* = (x^*, \dots, x^*)$ is a Nash equilibrium in the situation of zero valence. This result relies on the assumption of the concavity of vote share functions, which cannot in general be assured. Schofield (2007) defines a weaker equilibrium concept – a local strict Nash equilibrium (LSNE) defined below.

Definition 8 *A strategy vector $\mathbf{z}^*$ is a local strict Nash equilibrium iff, for each agent $j \in P$, there exists a neighborhood X_j of z_j^* in X such that*

$$V_j(z_1^*, \dots, z_j^*, \dots, z_p^*) > V_j(z_1^*, \dots, z_j, \dots, z_p^*) \quad \text{for all } z_j \in X_j - \{z_j^*\}. \quad (3.3)$$

It can be readily seen that this definition does not rely on the global concavity

of voters' probabilities functions, but the LSNE is defined as local maximum of the vote function given positions of all other parties. In a similar manner a local Nash equilibrium (LNE) is defined:

Definition 9 *A strategy vector $\mathbf{z}^*$ is a local Nash equilibrium (LNE) iff, for each agent $j \in P$, there exists a neighborhood X_j of z_j^* in X such that*

$$V_j(z_1^*, \dots, z_j^*, \dots, z_p^*) \geq V_j(z_1^*, \dots, z_j, \dots, z_p^*) \quad \text{for all } z_j \in X_j. \quad (3.4)$$

Obviously by definitions 8 and 9 if $\mathbf{z}^*$ is a LSNE it is also a LNE. We will further assume that the joint distribution of the error term is the Type I extreme value distribution. For all the minor assumptions necessary to prove the following theorem please refer to Schofield (2007). The following definitions are however, needed to present the main theorem of Schofield (2007).

Definition 10 *The electoral covariance matrix.*

1 *The electoral covariance matrix is $\nabla^* = \frac{1}{n}\nabla$, where ∇ is $[(\xi_s, \xi_t)]_{w \times w}$ and $\xi_t = (x_{1t}, x_{2t}, \dots, x_{nt}) \in R^N$ is the vector of the t -th coordinates of the set of n voters' ideal points and $(\cdot)$ denotes a scalar product.*

2 *The total electoral variance is*

$$v^2 = \sum_{r=1}^w v_r^2 = \text{tr}(\nabla^*), \quad (3.5)$$

where w is the dimensionality of the issue space.

Definition 11 *The convergence coefficient of the valence model.*

1 *Define*

$$\rho_j = \left[1 + \sum_{k \neq j} \exp(\lambda_k - \lambda_j) \right]^{-1}. \quad (3.6)$$

2 The coefficient A_j for party j is

$$A_j = \beta(1 - 2\rho_j). \quad (3.7)$$

3 The characteristic matrix for party j is

$$C_j = [2A_j \nabla^* - I_{w \times w}]. \quad (3.8)$$

4 The convergence coefficient of the model is

$$c = 2\beta(1 - 2\rho_1)v^2 = 2A_1v^2, \quad (3.9)$$

where valence is ranked so that $j = 1$ denotes the party with the lowest valence.

For the joint origin to be a LNE the following necessary conditions must be met as given by Theorem 3.

Theorem 3 (Schofield, 2007) *The joint origin satisfies the first-order necessary condition to be a LNE for the valence model. The further second-order necessary condition for the joint origin to be an LNE is that every eigenvalue of the characteristic matrix $C_1 = [2A_1 \nabla^* - I]$ is negative.*

In the case that X is w -dimensional then the necessary condition for the joint origin to be a LNE for the valence model is that $c < w$.

A first-order necessary condition for the joint origin to be an LNE, which is always fulfilled whenever valence is determined exogenously, is provided in Schofield (2006). Intuitively a LNE at the joint origin is less likely, the greater are parameters β , v^2 and $\lambda_p - \lambda_1$.

Corollary 3 *In the two-dimensional case, a sufficient condition for the joint origin to be an LNE for the valence model is that $c < 1$.*

The most interesting conclusion from the above cited results for the purpose of this study is that whenever there exist bigger differences in valences of parties, that is when $\lambda_p - \lambda_1$ is large, we should observe more divergence in the equilibrium positions of parties. This result is very intuitive. Stokes (1963) was the first to stress the importance of non spatial aspects. It is understandable that the candidate with a valence disadvantage will lose the election if he chooses a platform identical to his opponent's. He thus has an incentive to choose a different platform. Valence advantages then account for differentiation in the spatial model. In the above cited model valence is exogenous with respect to a party's position in the issue space. If we introduce a concept that valence can be a function of the ideological stance, the results remain similar. Endogenous valence creation in Schofield (2006) is due to activists who provide contributions to parties. The utility function of voters is, thus given by

$$u_{ij} = \lambda_j + \mu_j(z_j) - \beta \|x_i - z_j\|^2 + \varepsilon_{ij}, \quad (3.10)$$

where $\mu_j(z_j)$ is the endogenous valence component, being a function of a party position. It is shown in Schofield (2006), that if we introduce the endogenous valence component, a necessary first order condition for the equilibrium is given by the balance equation

$$\left[\frac{d\epsilon_j}{dz_j} - z_j^* \right] + \frac{1}{2\beta} \frac{d\mu_j}{dz_j} = 0, \quad (3.11)$$

where the bracketed term is termed the marginal electoral pull of party j and is

a gradient vector pointing towards the weighted electoral mean. This weighted electoral mean is the point where the electoral pull is zero. The vector $\frac{d\mu_j}{dz_j}$ is called the marginal activist pull for party j . The balance condition informs us that whenever activist pull is strong, a more divergent solution will be in equilibrium.

It is important to stress that the model of Schofield (2006) predicts the *positive* impact of activists on the valence of a party, i.e. it refers to the 'grassroots' aspect of campaign financing. On the contrary, as we already noted in the introduction, rational voters should negatively assess the quality of a party if they find that it is involved in 'parleys' with 'plutocratic' funders. Obviously the value of the convergence coefficient and the activist pull are also functions of the β parameter and the variance of electoral preferences. It is reasonable to assume that variance of electoral preferences and the β parameter are not affected by the campaign finance law, so it is reasonable to assume randomness of them with regard to the analyzed institutions.

Conclusions similar to those of Schofield (2007) can be drawn from the theoretical results of Ashworth and Bueno de Mesquita (2009) who analyze a two-stage game. In the first step parties choose platforms and later they invest in costly valences. The marginal return to valence depends on platform polarization: the closer the platforms are, the more the election outcome is affected by valence. Consequently, candidates without policy preferences choose divergent platforms to soften the competition in valence. The findings of these two models are interesting, while although in both of them parties, do not have policy preferences (act as vote maximizers), differences in valence cause them to adopt divergent positions in equilibrium, which might increase quality of representation of voters' preferences.

Yet, another theoretical work that predicts similar behavior in a two-party model is Serra (2010), which finds that there is a positive relationship between platform polarization and valence polarization. If we interpret valence as campaign funds, then we are making a prediction that is consistent with an empirical fact in politics: an increase in campaign spending should be correlated with an increase in polarization, which has been observed in the United States during the past decades (McCarty et al. (2006)).

3.2.2 The Relationship Between Valence and Campaign Finance Law

Valence has been extensively analyzed and diverse scholars have given this term diverse interpretations. Valence advantage can be the result of e.g. a greater capacity to commit to a precise platform or party support (Wiseman (2005)). It can also be an effect of certain past events that affected popular perception of a particular party, such as corruption. Another interesting interpretation of valence is provided by Snyder and Ting (2002) in a model of party discipline. In their model, discipline screens potential members of a party on the basis of ideology. Thus more disciplined parties have less dispersed distributions of members' ideal points. Holding the mean ideology constant, this reduced dispersion acts as a valence term for risk-averse voters. A prominent interpretation of valence, is that it is built up by advertising or other campaign activities, as argued by, among others Ashworth and Bueno de Mesquita (2009). We adopt their approach in this work. In this interpretation valence is directly related to building up a name recognition or in other words a popular image of a party by engagement in campaigning. In this, it can be also described as persuasive campaigning as it

has been defined by Mueller and Stratmann (1994).

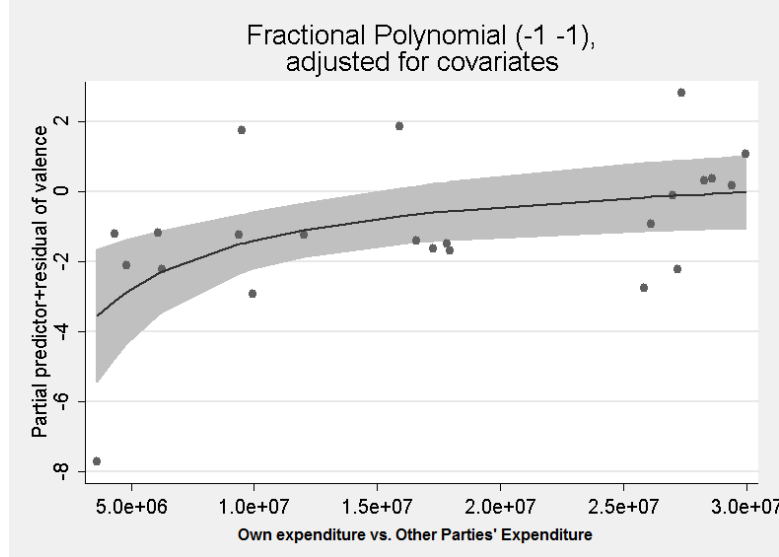


Figure 3.1: Relationship between expenditure and valence.

Figure 3.1 presents the relationship between the level of campaign expenditure¹ and valence of parties in parliamentary elections in the United Kingdom, Canada and Poland obtained with a MNL estimates of Schofield et al. (2010a), Schofield et al. (2010b) and Schofield and Jeon (2010) and those provided in Chapter 1 of this work. The fitted curve represents a fractional polynomial regression fit of the model, in which the level of valence is a function of both, own expenditure and spending of all other parties in each election. We observe a non-linear relationship between the level of spending and the level of valence, which is commonly found in studies of the impact of expenditure on electoral results in both majoritarian (see e.g. Jacobson (1985)) and proportional representation systems (e.g. Benoit and Marsh (2010)). Decreasing marginal return to spending implies that parties, which already gathered a substantial stock of valence are

¹Sources: Official reports of electoral commissions of Poland (State Electoral Commission of Poland (2005)), Canada (Elections Canada (2004)) and the United Kingdom. (The Electoral Commission (2005))

not able to alter their popular image as much as their less-known competitors.

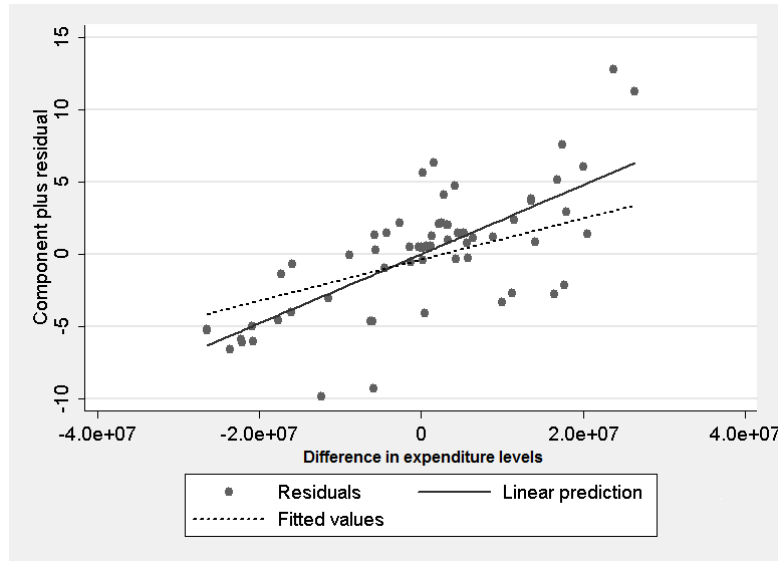


Figure 3.2: Relationship between differences in expenditure and differences in valences between the parties.

Another way to present the relationship between valence and expenditure is shown in Figure 3.2. The dependent variable is the difference between valences of pairs of parties in each election. It is a function of both own spending and the expenditure of the opponent. More precisely we regress the difference in valences on the difference in expenditure levels of both parties. The dashed line in Figure 3.2 depicts fitted values from this regression. The solid line represents a linear prediction from the model in which we also add differences in fractions of spending relative to the overall spending for each pair of parties in the election. We observe a positive relationship between the lead in valence in each pair and the advantage in campaign expenditure.

Combining the above findings we hypothesize that differences in valence should be associated with more divergent positions of parties. We will turn to a more precise description of the impact of the each analyzed institution on platforms in the next section.

3.3 Data and Methodology

3.3.1 Campaign Finance Institutions

Table 3.1: Campaign Finance Institutions – A Summary

Questions	No. of countries ^a
Is party financing regulated? ^b	34
Is there an obligatory public disclosure of financial statements?	32
Is there a limit on how much a party can raise?	4
Is there a limit on campaign expenditure?	21
Is there a limit on individual contributions?	25
Do parties receive direct public funding?	39
Do parties receive <i>equal</i> direct public funding?	3
Do parties receive indirect public funding (e.g. free media access)?	36
Do parties receive <i>equal</i> indirect public funding?	16
Is there a ban on corporate donations?	12
Total	46

^aA number of countries in the sample, in which the institution is in place.

^bAccording to assessment of IDEA and Council of Europe, in some countries within the sample certain aspects of party financing laws are poorly regulated and practical enforcement of legal provisions is impossible.

A number of countries in our sample are characterized with a rather weak rule of law and imperfect enforcement procedures. In certain cases particular institutions are *de jure* present, but are not followed in practice. That is why we decided to trust the assessment of legal institutions conducted in expert analyses, rather than directly studying electoral law. We denoted presence of a particular institution only in cases, in which evaluation reports stated practical importance of a certain rule. The list of sources of these data is provided in Table 3.5 in the appendix. Data on party positions, as provided by Benoit and Laver (2006) correspond to diverse elections in diverse years. Party funding law has been subject to change in the analyzed countries. The reason for these changes was, among others Council of Europe recommendations for particular cases. In most cases it was possible to assess, only on a basis of country reports, which rules were in place for the election period, but not always. We, thus excluded one country

from the sample (Belarus²).

Based on the theoretical predictions from Schofield (2006) as well as the literature on special interests, we formulate the following hypotheses about the impact of diverse institutions on the policy convergence. Various limits on spending and income should positively affect convergence in platforms. There are two channels for this effect. First is that the limit on campaign expenditure decreases the ability to create a popular image by campaign efforts for bigger, well-known parties, which should result in smaller differences in valences between the competitors. Thus, as predicted by the theory a limit on campaign spending should be associated with more convergent platforms.

The second channel is the impact of interest groups or, using nomenclature of Schofield (2006), party activists' contributions. Whenever private financing is involved, its effect on valence is unclear. On the one hand, valence is created endogenously by grassroots contributors, but on the other, rational voters knowing that parties can trade policies and non-policy favors for funding from plutocratic sources, might have worse perceptions of parties' quality. We will assume, that there are two groups of voters in the society: informed and uninformed and that campaign activity is in its nature persuasive (that is, it affects valence) and not informative. In the spatial model context with probabilistic voting, uninformed means that the error term in the utility is high, and therefore the β parameter is low - hence, the vote share is less fragile to changes in platforms. Parties distort their policy choices to attract money from interest groups and then use this money to attract the votes of the uninformed, by the cost of losing the votes of the

²Moreover, in the case of Belarus it is, because of its political environment, improbable that any rules included in the electoral legislation are of practical importance, which was an additional factor for which we decided to exclude this country from the analyzed sample.

informed electors. This relies on the assumption, that only the informed voters have rational expectations about the interest groups' activities to distort platforms. In case the uninformed voters also had rational expectations, a majority of them would switch their votes to the unadvertised party and the advertising would actually lose parties' votes and none would be undertaken in equilibrium. This clearly contradicts factual observations. The overall effect of private financing on platforms will, thus depend on the strength of three effects: the increase in valence by persuading the uninformed voters, the centrifugal interest groups' pull and the magnitude of the decrease in valence associated with policy distortions. In any case, as predicted by Schofield (2007), in equilibrium the lowest valence parties will be located farthest away from the center of electoral preferences. The opposite also holds: parties that distorted their platforms to the most radical positions, will have the lowest valence. It is important to understand, that the result holds only *in equilibrium*. The theoretical literature predicts that the relationship between the assessed quality of a party and its position runs in both directions and that the equilibrium results of Schofield (2007) do not add any more insight to the question of causality.

Direct as well as indirect public funding is argued to promote representation, as it allows smaller parties to gather funds to compete with stronger parties. The existence of public funding should in principle positively affect the number of parties present, however the effect on valence creation is again unclear. Whenever public funding is provided, it can *de facto* emphasize differences in valences and consequently lead to stronger divergence of policies. Such a freezing effect is suspected because the distribution of both direct payments and indirect subsidies (such as allocation of free broadcast time) tends to be proportional to past party success (Scarrow (2007)). The hypothesis of divergence as a result of public

funding will therefore be true under the assumption, that inequality of funding overwhelms the effect of decreasing marginal return to campaign efforts. If the second channel for divergence, that it is the impact of activists, is also present, public financing can serve to decrease it by replacing 'tainted money' with public means. That is why we also test the impact of an interaction between a ban on corporate donations and matching public funding. This interaction coefficient is expected to have a negative sign.

Finally, an intuitive determinant of divergence of parties' positions is the effect of proportional representation (see, Ezrow (2008) for a detailed discussion). The effect of proportional representation versus plurality rule on divergence is twofold. Firstly, by means of Duverger's Law it is associated with a higher number of parties than under plurality, and what follows practical existence of more radical candidates. The second effect is more interesting. Schofield et al. (2010a) formulated a hypothesis that the convergence coefficient will be higher under proportional representation because of the usual necessity to form coalitions after the elections. They argue that activist groups do not need to coalesce before the election to concentrate their influence. Activist groups linked to small parties can still have access to the government as the bargaining domain (the heart) in proportional representation systems will typically depend on the location of smaller parties. These theoretical predictions have not been empirically confirmed. Ezrow (2008) finds no evidence that average party policy extremism increases under proportional representation, nor that the policy extremism increases in countries that feature large numbers of parties³.

The main problem associated with the interaction between policy divergence

³In one of the empirical specifications that we tested in this study we included the effect of proportional representation and the number of parties but did not find it significant in the regressions.

and campaign finance institutions is that the causality runs in both directions. A state legislative authority is likely to adopt strict rules in order to decrease the impact of special interest groups on platforms. If the legislator implements campaign finance institutions on a basis of divergence in platforms, they will be endogenous in the model. Table 3.2 taken from Stratmann (2003), shows correlations between the index of electoral rules strictness and three different indices of corruption.

Table 3.2: Electoral rules and corruption.

BPI2002 ^a	CPI2002 ^b	WBCC2001 ^c
-0.7014	-0.4694	-0.5133
(0.0075) ^d	(0.0904)	(0.0605)

^aTI Bribe Payers Index

^bTI Corruption Perception Index

^cWorld Bank Corruption Control Index

^dStd. errors in brackets

Stratmann (2003) notes that we cannot argue that strictness of rules causes corruption, or that the opposite relation is true. Rather, an unobservable variable such as a country specific "corrupt culture" may lead to the adoption of contribution limits and the presence of corruptness. Thus, the correlation result may be due to the fact that countries that have an inherently more corrupt culture will introduce strict rules in order to address the problem of already high levels of corruption. We present in Table 3.3 results of correlating particular institutions that we analyze with two measures of the quality of the state and its independence from political pressure estimated by the World Bank (Kaufmann et al. (2010))⁴.

The results presented in Table 3.3 lead us to a conclusion that a limit on individual contributions indeed might be a function of a general level of the

⁴One must note that diverse measures of quality of governance tend to be highly correlated with each other and with measures of corruption.

Table 3.3: Campaign finance institutions and the quality of governance.

Questions	GE ^a	CC ^{b,c}
Is there an obligatory public disclosure of financial statements?	-0.2896	-0.3280
Is there a limit on how much party can raise?	-0.3059	-0.3730
Is there a limit on campaign expenditure?	-0.1221	-0.1327
Is there a limit on individual contributions?	-0.5185	-0.5158
Do parties receive direct public funding?	0.0585	0.0798
Is there a ban on corporate donations?	-0.1118	-0.0447

^aGovernment Effectiveness – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures.

^bControl of Corruption – capturing perceptions of the extent to which public power is exercised for private gain, as well as "capture" of the state by elites and private interests.

^cFor both indicators higher value denotes higher quality of governance.

quality of governance and that it needs to be considered endogenous with respect to platforms' divergence. In other words, strict contribution limits are also *an effect* of a strong impact of special interests on party platforms.

To consider for all the above observations, we build a two-equation model, in which one equation describes the behavior of parties being the effect of certain campaign finance institutions, whereas the other describes the endogenous choice of electoral rules by the legislator on a basis of his beliefs about level of impact of special interests on parties' platforms. On a basis of correlations reported in Table 3.3 we will assume that the limit on individual contributions should be treated endogenously, whereas the decision to implement other institutions does not seem to be affected by the overall quality of governance in our sample.

3.3.2 Party Positions Estimates

The estimates of the party positions in diverse ideological dimensions were obtained from a study by Benoit and Laver (2006). Benoit and Laver (2006) present the estimates of party positions based on expert surveys in 47 countries. A total of 36 questions were asked, 13 of which were country specific (e.g. the sovereignty of Quebec in the case of Canada), 7 were specific to only a group of countries

denoted as post-communist (e.g. the issue of privatization), 8 concerned European integration and the rest corresponded to general policy dimensions, such as economic policy, social world-view, environment protection, immigration and so on. Moreover, each dimension has been given a score which defines its relative importance for the voters' decision in each country. Additionally, each expert has been asked to place each party on a left-right scale, solely on the basis of his judgement, which does not have to be directly related to the platforms. As shown by Benoit and Laver (2006), there is a strong relationship between the left-right placement and social and economic dimensions. Table 6.1 in Benoit and Laver (2006) indicates that the adjusted R^2 for the model, in which social and economic dimensions act as regressors for the left-right placement is high for most countries in the sample, with significant coefficients for both dimensions in 31 out of 46 countries.

However, not for every country in the sample the socio-economic left-right dimension was the one for which the strongest variation of parties' positions is observed. Additionally, in each country various policy dimensions are not equally important for peoples' voting decisions. We constructed an index that takes into account both the fact that parties have different stances in different dimensions and that some of policy dimensions are more important for voting decisions. Its construction is similar to the index of party compactness of Alvarez and Nagler (2004). It also uses the information about the electoral results of parties in the analyzed elections. We shall call this index *weighted party extremism*. We assume that in each country the mean voter is located at the system center in each policy dimension. Weighted party extremism is defined as:

$$\text{WPE}_k = \sum_d I_d \frac{\sum_j V S_j |P_{jk} - MV|}{\sigma_{jk}}, \quad (3.12)$$

where: P_{jk} – the ideological position of party j in country k , MV – the mean voter position, VS_j – the vote share of party j , σ_{jk} – the standard deviation of voters' self-placement in the left-right scale, I_d – the relative importance of the policy dimension d .

This measure captures relative distances between the parties in each of the policy dimensions. It also accounts for the fact that voters might have more or less dispersed preferences. Moreover, it takes into account the fact that very extremist parties are not actively present in the political scene. Finally, weighting by the relative importance of each dimension reflects the fact that in relatively less important policy dimensions the positioning might not have a significant effect on the levels of valence of parties. A higher value of the index reflects divergence from the system center.

3.4 Results

In this study we are interested in the behavior of parties, and not the decision of the legislature to implement particular rules. Therefore, we concentrate on the analysis of the first equation. As we described, there is an unobserved common factor that affects both the choice of institutions and the policy divergence. Thus, errors in the equations are likely to be correlated. We, therefore employ a three-stage least squares procedure and estimate the two equations simultaneously. The base-line model consists of two equations. One describes the choice of positions by parties as a result of the institutions in place. The second contains description of behavior of the authorities to introduce these (endogenous) institutions.

$$\text{WPE}_k = \mathbf{X}_k\beta + \mathbf{Z}_{1k}\delta + \nu_k \quad (3.13)$$

$$X_k = \text{WPE}_k + \mathbf{Z}_{2k}\gamma + \omega_k, \quad (3.14)$$

where: X_k is the vector of endogenous institutions, Z_{1k} and Z_{2k} denote the exogenous variables and $E(\nu_k\omega_k) \neq 0$. We instrument for the general level of "corruptness" of a country with urbanization rate and education level measured as gross enrolment in tertiary education - variables that describe the level of development. These should be exogenous with respect to both the choice of institutions and the policy divergence⁵. We found these⁶ to be strongly correlated with the perception of corruption (see Table 3.9 in the appendix; see also, e.g. Rosenson (2009) for a further discussion). The three-stage least squares procedure is less robust than the two-stage least squares method to potential endogeneity of the instruments in any of the equations. Nevertheless, the Hansen-Sargan statistics suggest, that the instruments are with high probability valid and the advantage is of this method is that it uses more information about the correlation structure of the errors between the equations.

Schofield (2007) predicts a linear relationship between the difference in valences of parties and the convergence coefficient. Moreover, there is no obvious reason for why campaign finance institutions would affect convergence in a non-linear way. Therefore we apply a linear specification for the equation describing the behavior of parties. There is also no theory that would suggest the use of a specific form of a relationship between the decision of the state to introduce

⁵Here we shall report the estimated coefficients of the behavioral equation for the parties, which we are mostly interested in. Full results are reported in the appendix.

⁶Source: World Development Indicators, The World Bank

campaign finance institutions and their assessment of the role of special interests on policies. Thus, we also choose a linear form of the second equation. Additionally, we control for the number of parties in the political scene, defined as the effective number of parties (see, Laakso and Taagepera (1979) for details). It is important to notice that the magnitudes of the coefficients do not have an exact interpretation, the only important feature is the the sign, positive meaning a tendency towards more party extremism.

Table 3.4: Divergence – 3SLS regression

Dependent variable	WPE	
	Coefficient ^a	z-Stat.
Public Disclosure	18.23	(1.98)**
Ceiling on Contributions	-29.76	(-2.96)***
Direct Public Funding	9.26	(2.01)**
Equal Public Funding	-14.84	(-1.46)
Ban on Corporate Donations	35.78	(2.13)**
Ban on Corporate × Direct Public	-24.34	(-1.42)
Effective Number of Parties	2.86	(1.87)**
Constant	70.69	(3.20)***
Pseudo R^2		0.26
Hansen–Sargan p-value		0.55
No. of observations		46

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

Public disclosure of income and expenditure statements has a positive effect on platforms' divergence. A direct technical insight from Theorem 3 is that the lowest valence parties will locate their platforms farthest away from the joint origin. The opposite relation is also true. Parties for which policy is strongly distorted away from the center will actually have the lowest valence, whenever there

is a least one voter with rational expectations. We therefore, argue that public disclosure positively influences valences of parties who remain at the center of the distribution of preferences. The reason is that, these are willing to report legitimate funding and raise their credibility in terms of sources of funding. For low valence parties, whose positions have been determined by the influence groups, public disclosure means a further decrease in valence, which causes them to adopt even more radical positions.

The coefficient for ceiling on individual contributions is strongly significant and negative. This finding is consistent with the literature on interest group impact on policies. We associate this result, with decreasing the activist pull effect. This result is also in line with the empirical results of Stratmann (2006b) who finds that (though, only for a two-party competition) in states with contribution limits, incumbent spending and challenger spending are equally productive. In addition, spending by both candidates is quantitatively important in increasing their vote shares. In other words, contribution limits, keeping platforms fixed, increase the perception of the quality of the candidates. As we see in Table 3.3, the ceiling on individual contributions is more likely in countries with lower quality of governance, but apparently it does have a significant impact on reducing the role of special interests on platforms.

The coefficient for direct public funding is positive. As we observe almost no correlation between this institution and the quality of governance, we argue that the even more stressed valence advantage of bigger parties is the cause of this effect. In other words, this result shows that proportional public funding retains the advantage of bigger parties in campaign activities. This effect should be to some extent eased in those cases in which public funding is provided at an equal (or almost equal) basis. However, in the basis formulation we find that the effect

of equal public funding is not significant.

The case of a ban of corporate donations is more complicated. It turns out not to be significantly correlated with the quality of governance and perception of interest groups' activity, and at the same time it is related to high divergence of policies. We argue that, whenever the state is not able to enforce compliance with the law. By banning corporate donations, it has in practice less control over the sources of income. It has been found in various legal and economic studies, that severity of the law might have an adverse effect on compliance if it is not accompanied by effective enforcement. Becker (1968) shows that the probability of conviction and punishment negatively affects the utility from the commitment of a crime. Thus, a higher risk of detection is associated with less crime. The cost of crime (measured by the severity of punishment) is not enough to deter undesired behavior as long as the probability of detection is low. So far, we treated adoption of corporate bans as exogenous, but this result suggests that it might be endogenous with regard to the quality of law enforcement, which clearly requires further study.

Next, we find a negative effect of the interaction between a ban on corporate donations and the presence of direct public funding on divergence, which is however insignificant. It would suggest, that a ban on corporate donations might be a more effective tool for fighting activists' impact on policies, if accompanied by direct public funding. The latter, to some extent diminishes the incentive of parties to seek illegal outside financing, while it decreases the gain from such an activity, but that effect is very weak in our case.

Other variables that we tested for, as listed in table 3.1, in particular ceiling on the overall amount of financial means that can be collected by a party, ceiling on expenditure and indirect public funding were found not to have a significant

effect on platforms' divergence.

3.4.1 Sensitivity Analysis

We employed certain robustness checks to test the sensitivity of our results. The results of various specifications are reported in the appendix. We first tested the effects of restricting the sample to 27 well-developed countries, that is by excluding those denoted as post-communist. These countries are characterized by less dispersed levels of development of political institutions. Thus, one might expect less variance in the unobserved level of "corruptness" among them. Therefore the magnitudes of coefficients should be lower, as the impact of interest groups will be less severe. As Table 3.10 in the appendix shows, the signs of coefficients remain the same and the magnitudes are indeed lower. Interestingly, the interaction term between a ban on corporate donations and direct public funding is statistically significant at a 5% level in this regression. This suggests, that in cases of well-developed countries a mixture of these two policies leads to more convergence in platforms. As noted before, the issue of practical enforcement of legal provisions might be a crucial factor here.

A second check was to exclude the ban on corporate donations, as with respect to this variable we suspected that it might be endogenous. As we present in Table 3.8, it is not strongly correlated with other regressors. Thus, the omitted variable bias is unlikely. Table 3.12 shows that the signs of coefficients are robust to this test, but the significance is lower for most coefficients. We did not perform a similar check of excluding the public disclosure variable, as it is relatively strongly correlated with the ceiling on contributions. Excluding it from the regressions, might lead to an omitted variable bias, which would cause a problem with interpreting this result. Finally, we restricted the sample to the countries

with proportional representation electoral system, which makes it more unified. In this case, signs of coefficients also remain the same and a significant effect of direct public funding on platforms' divergence remains in place (Table 3.11).

3.5 Conclusions

The results show that there is a significant correlation between certain campaign financing law provisions and policy convergence in the spatial context. We find a robust effect that a ceiling on individual contributions is associated with more convergent platforms. Direct public funding, on the other hand is associated with more divergent policies. Additionally, we find that a ban on corporate donations is not an effective tool for fighting interest groups' impact on platforms, as it decreases the extent to which the state is able to control the sources of income. We find it to be related to lower divergence of platforms in cases, in which it is accompanied by the matching public funding, but the effect is weak.

In this paper, we focused only on the effect that various institutions have on parties' positions. However, as noted, these institutions are most probably endogenous with respect to variables describing the quality of governance and party extremism. There are possibly also other determinants important for the decision to introduce certain institutions. These are not included in the analysis conducted in this work and a closer look is left for future work. Another way how the theoretical predictions of Schofield (2007) could be tested is to analyze directly the campaign expenditures for individual parties on their positions in the issue space. However, in many countries there are no rules for public disclosure of expenditure statements, and in some cases there is no obligation at all to register campaign expenditure. Thus, access to the necessary data will be limited to the

countries, in which such rules are in place.

Another way to improve on the quality of estimates would be to broaden the sample of the countries tested. This would, however be subject to certain shortcomings. The analyzed sample consists of well-developed countries for which we have access to credible data regarding electoral law and the placement of platforms. Broadening the sample, would mean inclusion of less-developed countries with potentially unstable political situation and weak enforcement of law. This, could raise the question of quality of the data used. We are aware that there are limitations to interpretations of coefficients estimated in this study, but as we stated this is a first attempt to test empirically the role of diverse campaign law institutions on policy positions of parties. Most concern has to be given to the issue of potential endogeneity of the ban on corporate donations and practical enforcement of campaign law provisions.

3.6 Appendix: Tables

Table 3.5: Sources of data on institutions

Funding of Political Parties and Election Campaigns	Austin and Tjernström (2003)
Party and Campaign Funding in Eastern Europe: A Study of 18 Member Countries of the ACEEEO	Ikstens et al. (2001)
Money in politics: a study of party financing practices in 22 countries	Bryan and Baer (2005)
Evaluation Report on Slovenia on Transparency of Party Funding	GRECO (2007)
Evaluation Report on the United Kingdom on Transparency of Party Funding	GRECO (2008b)
Evaluation Report on Luxembourg on the Transparency of Party Funding	GRECO (2008a)
Evaluation Report on Turkey on Transparency of Party Funding	GRECO (2010b)
Evaluation Report on Greece on Transparency of Party Funding	GRECO (2010a)

Table 3.6: A list of countries in the sample

ALBANIA	GREECE	NORTHERN IRELAND
AUSTRALIA	HUNGARY	NORWAY
AUSTRIA	ICELAND	POLAND
BELGIUM	IRELAND	PORTUGAL
BOSNIA	ISRAEL	ROMANIA
BULGARIA	ITALY	RUSSIA
CANADA	JAPAN	SERBIA
CROATIA	LATVIA	SLOVAKIA
CYPRUS	LITHUANIA	SLOVENIA
CZECH REPUBLIC	LUXEMBOURG	SPAIN
DENMARK	MACEDONIA	SWEDEN
ESTONIA	MALTA	SWITZERLAND
FINLAND	MOLDOVA	TURKEY
FRANCE	NETHERLANDS	UKRAINE
GERMANY	NEW ZEALAND	UNITED KINGDOM
		UNITED STATES

Table 3.7: 3SLS regression – The basic formulation

Dependent variable	WPE	
	Coefficient ^a	z-Stat.
Public Disclosure	18.23	(1.98)**
Ceiling on Contributions	-29.76	(-2.46)**
Direct Public Funding	9.26	(2.01)**
Equal Public Funding	-14.84	(-1.46)
Ban on Corporate Donations	35.78	(2.13)**
Ban on Corporate × Direct Public	-24.34	(-1.42)
Effective Number of Parties	2.86	(1.87)**
Urban	-0.31	(-1.05)
Constant	70.69	(3.20)***
Pseudo R^2	0.26	
Dependent variable	Ceiling on Contributions	
	Coefficient ^b	z-Stat.
WPE	.03	(3.15)***
Tertiary Education	-.01	(-1.90)*
Constant	-2.20	(-2.60)***
Pseudo R^2	0.34	
Hansen–Sargan p-value	0.55	
No. of observations	46	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

^bSignificance: *** 1 percent, ** 5 percent, * 10 percent

Table 3.8: Correlations between the explanatory variables

	PD ^a	DPF ^b	BoCD ^c	CoC ^d	U ^e
PD	1				
DPF	-.05	1			
BoCD	.17	.14	1		
CoC	.43	.04	.24	1	
U	-.02	-.13	.01	.44	1

^aPublic Disclosure

^bDirect Public Funding

^cBan on Corporate Donations

^dCeiling on Contributions

^eUrbanization

Table 3.9: Correlations between the instruments, the measure of divergence and the measures of governance quality

	GE ^a	CC ^b	RL ^c
Weighted Party Extremism	-0.48	-0.48	-0.45
Urbanization	0.46	0.47	0.41
Education	0.62	0.60	0.57

^aGovernment effectiveness

^bControl of corruption

^cThe rule of law

Table 3.10: 3SLS regression – Only well-developed countries

Dependent variable	WPE	
	Coefficient ^a	z-Stat.
Public Disclosure	16.33	(1.68)*
Ceiling on Contributions	-28.00	(-1.20)
Direct Public Funding	14.33	(2.08)**
Equal Public Funding	3.07	(0.29)
Ban on Corporate Donations	40.92	(1.82)*
Ban on Corporate × Direct Public	-39.74	(-2.27)**
Effective Number of Parties	2.34	(1.57)
Urban	-0.28	(-0.78)
Constant	79.77	(2.30)**
Pseudo R^2	0.27	
Dependent variable	Ceiling on Contributions	
	Coefficient ^b	z-Stat.
WPE	.04	(1.82)*
Tertiary Education	-.01	(-1.00)
Constant	-2.17	(-1.59)
Pseudo R^2	0.33	
Hansen–Sargan p-value	0.10	
No. of observations	27	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

^bSignificance: *** 1 percent, ** 5 percent, * 10 percent

Table 3.11: 3SLS regression – Only proportional representation countries

Dependent variable	WPE	
	Coefficient ^a	z-Stat.
Public Disclosure	16.14	(1.40)
Ceiling on Contributions	-25.76	(-1.18)
Direct Public Funding	9.13	(1.98)**
Equal Public Funding	-17.29	(-1.77)*
Ban on Corporate Donations	10.80	(2.35)**
Ban on Corporate × Direct Public	Collinear	
Effective Number of Parties	3.11	(2.41)**
Urban	-0.27	(-1.11)
Constant	66.30	(3.40)***
Pseudo R^2	0.37	
Dependent variable	Ceiling on Contributions	
	Coefficient ^b	z-Stat.
WPE	.03	(3.14)***
Tertiary Education	.01	(1.99)**
Constant	-1.80	(-2.47)**
Pseudo R^2	0.11	
Hansen–Sargan p-value	0.38	
No. of observations	35	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

^bSignificance: *** 1 percent, ** 5 percent, * 10 percent

Table 3.12: 3SLS regression – Ban on corporate donations excluded

Dependent variable	WPE	
	Coefficient ^a	z-Stat.
Public Disclosure	16.92	(1.81)*
Ceiling on Contributions	-20.02	(-1.09)
Direct Public Funding	7.40	(1.65)*
Equal Public Funding	-10.09	(-0.96)
Effective Number of Parties	1.44	(1.16)
Urban	-0.22	(-0.84)
Constant	71.49	(3.24)***
Pseudo R^2	0.26	
Dependent variable	Ceiling on Contributions	
	Coefficient ^b	z-Stat.
WPE	.03	(2.89)***
Tertiary Education	.01	(1.88)*
Constant	-2.33	(-2.44)**
Pseudo R^2	0.40	
Hansen–Sargan p-value	0.36	
No. of observations	46	

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

^bSignificance: *** 1 percent, ** 5 percent, * 10 percent

Chapter 4

The Failure of Direct Democracy Implementation: Case Study of Local Referenda in Poland

4.1 Introduction

Many transitional economies in Central and Eastern Europe provided direct democratic instruments in their legal order. For example, both Hungary and Russia have included the right of citizens to exercise local self-government through referenda in their constitutions . These countries introduced elements of direct democracy as part of their reforms of public administration in the early 1990s, which was seen as an important part of the democratization process. The most frequently applied instrument is the local referendum (Buček and Smith (2000)). Political science literature regard inducing electoral participation in local decision-making as one way to induce democratic transition. Additionally, the literature presents a number of arguments for why introduction of direct

democracy instruments in transition countries should lead to improved economic performance (e.g. Frey (2003)). Using example of the local referendum in Poland, we wish to show that the sole fact of introducing direct decision-making on the local level does not lead to the desired outcome, and in particular to an improved economic performance. Our main goal in this paper is to identify reasons for why the introduction of direct democracy in local fiscal decisions did not have the expected and both theoretically and empirically well-grounded effect. We believe that this 'failed' experiment can provide meaningful policy insights regarding problem of attentive choice of economic details in constructing a legal instrument.

Referendum on self-imposed taxation of municipality-dwellers is a specific form of voters' participation in fiscal decisions of local communities. The public choice literature identified that instruments of direct democracy have an important influence on various economic characteristics of countries or regions. Among others, direct voter participation in fiscal decisions is believed to have a positive impact on the efficiency of public goods provision as well as it decreases debt and public expenditure. By means of public choice analysis we show that expected efficiency gain in fiscal policy is not present and the effect of using local referenda on expenditure is opposite from expected and this fact is directly related to high cost of popular initiative and what follows low electoral control.

Reform of the public administration structure in 1999 in Poland was aimed at transferring competence over a range of decisions, including fiscal ones to local level administrative bodies and self-government authorities. Policies, including provision of certain public services at most local levels are believed to be better tailored to the needs of local communities than decisions made on the central level.

So far the administrative structure of the country is still highly centralized and only a limited number of fiscal decisions are in the competence of local authorities. Even a smaller number of issues can be resolved with the use of direct democracy instruments such as a referendum or a popular initiative. At the same time we observe a constant low level of residents' interest in local self-government activities and their participation in local decision-making. Out of 367 referenda on the dismissal of a member of a local administration held in years 1999–2010 a total of 317 were invalid because of too low a turnout at the polls. A similar pattern has been observed for the case of popular initiatives. The number as well as average turnout at the polls has been in constant decline as shown in Table 4.1.

Table 4.1: Local referenda 1999-2010 – turnout and validity

Year	Number of referenda	Average Turnout	Valid ^a
1999	16	25.95%	4
2000	108	18.86%	14
2001	70	17.79%	7
2002 ^b	3	9.61%	0
2003	3	25.54%	1
2004	57	19.21%	9
2005	30	17.24%	2
2006	0	-	0
2007	2	26.64%	1
2008	35	18.83%	6
2009	32	18.37%	5
2010	10	14.64%	1

^aReferendum on dismissal as well as on self-taxation is valid if turnout is higher than 30% of eligible voters

^bObserved low number of referenda in 2002, 2003, 2006 and 2007 is due to local elections, that took place in these years. According to article 5(2) of the local referendum act, a dismissal initiative can be commenced not earlier than 10 months after beginning of the term of office of a local authority and not later than 8 months before the end of it. Referenda on dismissal make up for most of referenda that took place during the analyzed period.

We aim to analyze the institution of local referendum on self-imposed taxation of residents, in the light of the above observations. It is the only legal

instrument available to citizens that allows them to directly influence fiscal policy of municipalities. Although turnout for the case of self-taxation referenda was on average higher than in other local primaries, a substantial fraction of these was invalid.

Both the theoretical and the empirical literatures have found that institutions of direct democracy have a clear and robust effect on economic outcomes on the macro level. Several authors analyzed both referenda and public initiatives and found that the right of citizens to directly decide on political and economic issues affects levels of fiscal expenditure, public debt, tax compliance and many more. For example, Matsusaka (1995) found that U.S. states, in which fiscal decisions are subject to popular initiative, have lower expenditures and lower revenues. Similarly, for Switzerland, Feld et al. (2001) find that cantons with mandatory referenda on fiscal issues are characterized by spending and revenue lower by 7% to 11% compared to those in which no direct democracy instrument is present. The question of efficiency improvement related to direct democracy was, among others, addressed by Alt and Lassen (2003) and Pommerehne (1990). These studies show that institutions of direct democracy relate to lower level of corruption and increased efficiency of public goods provision.

We wish to test whether empirical regularities regarding the economic impact of direct democracy found in other studies, such as the effect on local expenditure and the efficiency of the provision of public goods are also present in our case. A vast majority of literature considers direct democracy institutions in USA and Switzerland, countries of federal structure and characterized with traditionally high electoral participation in local decision-making. Local referenda on self-imposed taxation in Poland, may be considered a direct democracy 'experiment' in a country, with until recently highly centralized public administration and

most importantly low interest for politics on both the national and local levels. The economic effects of voters' participation in local fiscal decisions might have opposite effect under these significantly different socio-political conditions. According to our knowledge this is the first study, that tries to assess economic effects of direct democracy decision-making in Central Europe. We decided to use a case study form, rather than a cross-country analysis to be able to conduct a deeper study of practical implementation of direct democracy. Rodriguez-Pose and Kroijer (2009) argue on a basis of data provided by the United Nations that in comparison to other countries in the area Poland is in an advanced stage of fiscal decentralization reform. We believe that deepen analysis of factors that might create fiscal outcomes unforeseen by the legislative body could serve as an experience worthwhile as policy advice for other countries in the region. Section 4.2 comprises presentation of legal provisions and associated interpretation of legal regulations, that form a basis of our analysis. We focus on elements that have direct impact on the discussed issues, that is required majority and subjective scope of referendum, interpretation of tax obligation and issues related to popular initiative. In section 4.3 we turn to analyzing implications of various aspects of local referendum from the public choice perspective. In particular we make use of a spatial model of voting to formulate testable hypotheses. Section 4.4 presents results of our empirical study of impact of direct democracy on expenditure level. Section 4.5 concludes and discusses the results.

4.2 Legal Provisions Concerning Referendum on Self-Imposed Taxation in Poland

According to the act on local referendum¹ it is a mandatory institution, whenever municipality wishes to introduce a tax aimed at providing a public good or service, which is a part of it's own tasks. In particular, it is most often used whenever municipality wishes to introduce a public waste disposal service. This issue fulfills conditions under which a referendum on self-imposed taxation can be convened. It is according to the law, a part of what is mentioned as "keeping the commune area clean" and is a part of municipality's own tasks but at the same time it is not obligatory. Thus, this kind of service (and also diverse other services most often concerning environmental issues) can, as foreseen by the cited legal acts, be provided publicly (by the local government) but it is not obligatory. In other words it is in the competence of local community members, to decide whether they wish to have their refuse disposed of by means of public service or not. Apart from waste disposal, public provision of diverse services can be decided upon via a referendum, as long as they qualify to be a part of commune's own tasks in light of self-government regulations. According to the above cited legal provisions, municipalities' authorities are obliged to decide on self-taxation via a referendum, in which voters will decide on imposing on themselves a payment. Citizens are also empowered to the right of initiative to propose levying this form

¹All provisions described in this section can be found in the following legal acts: the act on local referendum (Polish Journal of Laws 2000.88.985), the act on local self-government (1990.16.95), the act on keeping the municipality area clean (1996.132.622), judgement of the Supreme Administrative Court of Poland SA/Wr 1171/93 and resolution NSA FPK 15/97 of this court, the tax obligation statute (1996.75.357), the act on enforcement proceedings in public administration (1991.36.161), the act on proceedings in administrative courts (153.1270) and the Constitution of Republic of Poland.

of taxation on themselves. An initiative can be issued by a minimum of 10% of commune residents. A required majority for the decision about self-taxation to be binding is 2/3 of commune's population with participation of at least 30% of voters entitled to vote. In this, we may name the referendum in question semi-binding, with three outcomes possible:

1. A referendum is invalid, if turnout is lower than 30%.
2. A referendum is inconclusive, whenever none of the possibilities is given consent from over 2/3 of voters.
3. A referendum is valid, conclusive and binding, if one of the options receives more than 2/3 of votes.

An outcome of a referendum is only binding in the third of the enumerated cases, of which the interesting one is when members of the community decide for provision of a service by the local government. Moreover, a local referendum law directly stipulates this form of decision making only on the municipality level. Thus, *a contrario* not during fiscal decisions undertaken in voivodeships (provinces) or counties. It is therefore an instrument used only in decision-making at the most local level.

Although the law itself uses the notion of 'taxation' to describe the process of collecting money from the community to be spent on a public issue, the Supreme Administrative Court of Poland, addressed the question of whether it is indeed possible to treat this sort of payment as a tax, and therefore execute it's collection . The main interpretational problem associated with self-taxation of municipalities, which has been addressed by the Supreme Administrative Court lies in the fact, that according to the Constitution of Republic of Poland:

”The imposition of taxes, as well as other public imposts, the specification of those subject to the tax and the rates of taxation, as well as the principles for granting tax reliefs and remissions, along with categories of taxpayers exempt from taxation, shall be by means of statute.”

The earlier judgement states that self-taxation of municipalities bears all the features necessary to be considered a tax in the sense of public law doctrine, as it is among other characteristics a unilateral, compulsory public impost. This view is also shared by certain legal scholars (see, e.g. Czaplicki et al. (2007)). In this, according to the ruling, it is possible to execute its collection on a basis of tax obligation statute. However, according to the subsequent resolution, a commune is not entitled to set up a tax other than enumerated in the law (referring to the above cited constitutional norm), either by a public initiative or by a decision made by local authorities. In this, municipalities can decide via a mandatory referendum on gathering funds for a public aim, but the funding does not bear required features allowing it to be considered a tax. According to Ninard (1998) it is still possible to execute collection of it on a basis of other acts but in practice it might be significantly hindered. Also, the latter opinion is only a view of a legal scholar, and there exists no legally binding interpretation in favor of it. The position taken by the Supreme Administrative Court in its resolution also finds support among part of legal scholars (see e.g. Brzeziński (1995)). For the purpose of further analysis we will assume that municipalities are not vested with a legal instrument to be able to effectively execute collection of a payment levied by means of self-taxation as interpreted in the most recent opinion of the Supreme Administrative Court. In our opinion, the above cited resolution is the most direct reason for the low number of local fiscal referenda. Municipalities

left without a practical measure of execution of tax obligation would rationally not bear the cost of conducting it.

4.3 Theoretical Assessment

4.3.1 Expenditure and Direct Democracy – the Base-Line Model

We base our analysis of the effect of referendum on expenditure level on a spatial model developed by Feld and Matsusaka (2003), which we adapt to the fact that the majority required in the referendum equals $2/3$. This is also the base-line theoretical formulation used in regressions analyzing the impact of direct democracy on spending. Additionally, for clarity of exposition, we will assume that the preferences of residents are uniformly distributed on the $[0, 2M]$ interval, where M denotes the level of spending preferred by the median voter. Here, we briefly describe the structure of the model. The utility from the level of spending of a median voter is defined as an absolute deviation, that is

$$U(\text{Exp. Level}) = -|X - \text{Exp.Level}|,$$

where X denotes the ideal level of spending.² Under these assumptions, the median voter prefers the spending level M . Figure 4.1 presents a graphical presentation of the spatial model of Feld and Matsusaka (2003).

The model is based on the assumption that the government (in our case a

²Spatial models usually assume decreasing rather than constant marginal utility e.g. $U(\text{Exp. Level}) = -(X - \text{Exp.Level})^2$. We use this formulation for the clarity of exposition, whereas all the implications also hold for the typical quadratic utility function.

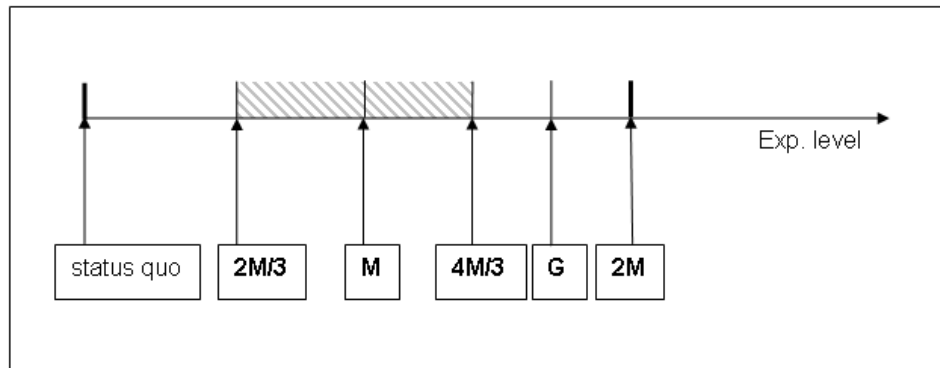


Figure 4.1: Spatial model of expenditure

local governing body) is willing to spend more than the median voter would do. This assumption is grounded on findings of among others, Romer and Rosenthal (1978). We shall turn to description of details of their findings and application of it later on. It is reasonable to assume that also in the analyzed case governing bodies wish to spend more than the median voter would. This is also confirmed in the empirical part of the study in the next section. The left end of the axis corresponds to 0 level of tax and expenditure, which in our case is also the status quo level. Point M denotes the ideal level of spending of the median voter and G is the level of spending desired by local authorities. If no mandatory referendum was in place, the local government would be free to choose any spending level that it desires, being only threatened by a possibility of being recalled from office. With a mandatory referendum present the situation is quite different. Under simple majority rule the spending level, which would be accepted by at least half of commune's population corresponds to point $2M$, this is twice as high as the ideal of the median voter. Under the assumption that preferences of voters are uniformly distributed, it is at the same time the level of spending corresponding to ideal of voter with the preference for the highest spending level. Thus, under the reasonable assumption that the ideal of the authority lies within borders of

preferences in the community, nothing is practically changed and the governing body can still choose its desired level of spending. Under 2/3 majority rule the situation is more favorable from the perspective of the median voter. The maximal spending level accepted by 2/3 of the residents is the one corresponding to the ideal of voter with preference in 2/3 of the distance between the status quo and the location of voter with the preference for the highest spending. With uniformly distributed preferences it corresponds to level of spending equaling $4M/3$. It is therefore lower than under simple majority rule. Another instrument envisaged in the law on local referendum is a popular initiative. Voters are allowed to propose their desired level of taxation and spending, and this proposal is then subject to a referendum. Initiative is not costless. It involves gathering signatures – in the analyzed case 10% of commune's members' signatures are required. However, in our case, it does not comprise the costs of holding a referendum, which is according to the law financed in any case by the local government. We denote by C the cost of gathering the required number of signatures. Note that any proposal located within the $[2M/3, 4M/3]$ segment will be accepted by at least 2/3 of the municipality population (dashed area in figure 4.1). Assuming that the proposal is issued by the median voter and including the cost, the level of spending in an initiative will equal $M + C$. The level of spending proposed by the local authority will depend on the cost of initiative, and equal $\max\{M + C, 4M/3\}$, so whenever $C > 4M/3$ it is possible that level of spending will be higher under initiative than under mandatory referendum.

These results hold only if the authority has higher willingness to spend than residents of the municipality. As results of Pommerehne and Kirchgässner (1991) show, this need not be necessarily the case. Data on various characteristics for local self-imposed taxation referenda (Table 4.2) show that the general level of

support is very high. Only in case of 4 valid referenda, support for provision of public service was lower than the required $2/3$ of votes. In only one case $2/3$ of voters decided against a public service, which made this decision binding. As shown in the empirical section, the level of spending is on average higher in municipalities in which referenda were held compared to the control sample. These facts strongly suggest that most of communities' residents once given the option to agree on taxation are in favor of it. This observation is in accordance with the findings of Pommerehne and Kirchgässner (1991), who state that growth of public expenditure is strongly determined by demand factors. At the same time, until 2010 there was no case of a successful initiative concerning the same kind of issue. In the next subsection we turn our attention to how this relation can be explained by a high cost of initiative.

4.3.2 Cost of initiative

During the analyzed period there was no case of a self-taxation initiative. This observation is puzzling regarding the high support for self-taxation encountered in municipalities that held referenda. One economic conclusion that can be made is that the cost of initiative is so high that it outweighs the perceived benefits from self-taxation. The 10% requirement seems not to be practically feasible in communes larger than several thousand residents. The largest communes in Poland, including big cities have up to 1.5 million residents, in which 39 communes have over 100.000 inhabitants. The signature requirement of 10% of communes' members, in case of larger communes means collecting 70.000–100.000 signatures. This is about the same as a nationwide popular initiative requirement of 100.000 signatures. Data of Piasecki (2005) on popular initiatives on removal of local authorities from office at the commune level show that the maximum number of

votes ever collected on a municipality level equaled slightly over 30.000.

An additional cost associated with public initiative arises from the law on local referendum itself. It states that costs of informing the public about the planned referendum, its aim, time and related issues is to be borne by the initiator of a referendum, in this case the residents of the commune. Thus, a group of residents interested in spreading the information about their desired issue is obliged to bear all the costs of information. This aspect further weakens the possibility of a successful initiative already at the municipality level.

The fact that a popular initiative is characterized by a very high cost has an important implication on agenda setting. In the analyzed case, a popular initiative is virtually impossible, because of high costs of signature collection. This creates a form of 'barrier to entry' in the formulation of proposals other than suggested by the local authority. As a consequence, the local authority exercises a quasi-monopoly power over agenda setting. Romer and Rosenthal (1978) find that, in case the *status quo* level of expenditure is lower than the median voter's ideal, there is a negative relationship between the status quo and the level of expenditure that solves the agenda setter's problem. In other words a monopolist agenda setter can exploit the voters by proposing a very high level of spending in case the *status quo* is far from what is preferred by the population. Romer and Rosenthal (1978) obtain a paradoxical result that in certain cases a majority of voters can be better off and allocative efficiency may be more nearly achieved when the setter can impose a tax without voter approval. This result and the following argumentation of Feld and Matsusaka (2003), which we presented in the previous subsection makes us believe that, despite high support for the public service voters are not necessarily better off in communes, which held referenda on provision of public service. We will turn back to deeper analysis of this problem

in light of the above described theoretical findings in the empirical section.

4.3.3 Required Majority and Geographical Scope

One of the key public choice arguments for collective decision-making is that it can help improve on efficiency whenever market failures are present. However, Pareto improvement associated with the decision is guaranteed only if it is made unanimously. Whenever the required majority is less than 100%, it is possible that certain individuals are made worse off than under the *status quo*. The difference between utilities of individuals gained from a policy set under unanimity and under any other majority rule, has been identified by Buchanan and Tullock (1962) as external costs of the decision rule. At the same time, unanimity itself is associated with a high cost. The optimal majority is the one for which the sum of the costs is the lowest (Mueller (2003)). According to Buchanan and Tullock (1962) the decision-time cost of achieving a required majority rises with increasing size of the community involved in decision-making process. It shall also rise with decreasing access to information about the particular decision in question.

The act on local referendum stipulates a 2/3 majority required in order for the result of a referendum to be binding. This, in connection with the fact that the referendum is stipulated only for the most local level of administrative division suggests that the legislator is aware of the above pointed out arguments. On the national level a majority of 2/3 is reserved for matters of highest importance, e.g. amendments to the constitution, in order to protect the minority from sharply rising external costs of the decision rule. On the local level, the legislator assumes that due to small community size and what follows relative homogeneity of preferences, decision-time costs should be sufficiently low and that gain in utility of individuals acquired by high supermajority outbalances them. By restricting

usage of the local referendum on self-imposed taxation only to decisions in the smallest units of administrative division, legislator tries to assure that such a requirement is practically feasible to achieve and at the same time that a cost of carrying out a referendum is low. However, as argued by Mueller (1996) there is no practical reason for which a required majority to pass a bill in a process of referendum should be different than the majority required for the same type of legislation when discussed in a legislative body, in this case a local council. A commune council in most cases adopts resolutions on diverse types of local taxes, including issues related to waste disposal and environment protection by simple majority under presence of at least half of the members. It is not clear why the legislator makes such a distinction between the majority required in the local council and the same type of fiscal issue decided in a referendum. If we apply technical arguments presented above to fiscal-decision making in the council, and under the assumption that make-up of the council reflects preferences of the commune, which is a valid assumption in a multiparty, proportional system, we must conclude that consistency of the law as well as efficiency considerations would require adopting a 2/3 majority rule in council decisions on local taxes.

4.4 Empirical Assessment

4.4.1 Data

Data concerning participation and results of local referenda were obtained on a basis of protocols published in Voivodeship Official Journals since 2000. They comprise results of 27 local referenda on self-imposed taxation held in 10 provinces in different parts of the country. Data on demographic and economic characteris-

tics of each commune were gathered from commune-level reports from a national census conducted by the Central Statistical Office in 2002. Data on expenditures of municipalities on refuse collection and subventions from the central budget were obtained from the Regional Data Bank of The Central Statistical Office. All the other information regarding characteristics of communes and their inhabitants were gathered from the Public Information Bulletin (BIP) and the Official Journal of the State Election Commission.

Local referenda were first introduced in 1990 in the act on local self-government and then later on in the act on local referendum, which constituted more specific features of this form of local decision-making. Despite a long presence in Polish legal system, it has so far not been often used. Data on local referenda conducted are available only for the period 2000–2010, for the act on local-referendum stipulated mandatory publication of communes' resolutions on conduction of referenda in voivodship official journal only in the year 2000.

4.4.2 Expenditure on refuse removal

Empirical studies have shown that directly democratic decision-making on fiscal issues is associated with lower budget debt and expenditure. Similarly direct democracy has been related to higher efficiency in the provision of public service. Studies, which are most closely related to problem analyzed in this paper are Pommerehne (1983) and Pommerehne (1990). These works deal with direct democracy effect on waste collection in Swiss towns and found that it is provided at lowest cost in those with private contractor and direct democratic elements. Similarly, Feld et al. (2001) found that net cantonal general level of expenditure is lower in Swiss cantons with direct democracy. In Swiss and American examples, particular cantons or states are characterized by a long tradition of

Table 4.2: Local referenda turnout and results – descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
Urban communes				
Turnout in %	47.58	12.27	36.04	61.27
% of YES votes	72.83	13.53	53.01	83.51
No. of inhabitants ^a	16673.25	19259.22	4391	45021
No. of inhabitants per electoral district	1433.93	354.31	1097.75	1875.87
Approx. distance to polling place ^b	1.11	0.46	0.65	1.73
Urban–rural communes				
Turnout in %	27.15	7.72	17.87	37.46
% of YES votes	64.94	22.92	23.82	94.88
No. of inhabitants	19265.38	11539.56	8224	39601
No. of inhabitants per electoral district	1279.64	255.14	944.25	1652.8
Approx. distance to polling place	1.95	0.45	1.43	2.81
Rural communes				
Turnout in %	39.73	10.57	17.59	53.84
% of YES votes	83.50	13.13	48.73	98.61
No. of inhabitants	7007.6	4390.35	2666	16015
No. of inhabitants per electoral district	834.59	224.09	561.55	1333
Approx. distance to polling place	2.32	0.7	1.34	3.59

^aNumber of inhabitants of the commune entitled to vote.

^bIn kilometers. Obtained by first dividing area of the commune by the number of electoral districts in it and subsequently finding a radius of a circle of equal area.

a certain decision-making procedure. For example, the state of South Dakota adopted initiative and referendum in 1898 and in the second – Oregon these were adopted in 1902. The action of holding a referendum in Poland and other transitional democracies might be, on the other hand rather an endogenous variable and an instrument of gathering additional funding for commune's own tasks. We base this supposition on findings of Romer and Rosenthal (1978), which we already described in the previous subsection. Whenever an expenditure-maximizing agenda-setter prefers a high level of spending he can make use of a referendum as a budget expansion device. In our case, the status-quo of zero tax and zero expenditure on the public service, as shown by generally high level of support in analyzed referenda is not desired by the majority of voters. In these conditions strong monopoly power of the local authority over the agenda can be practically used. There is a justified suspicion that the decision to kick-off a

referendum is endogenous with regard to both political affiliation of the council members as well as characteristics of the municipality.

Political affiliation has been found to determine the level of taxation in general and that left-wing governments tend to propose higher tax rates. Whereas some authors argue that partisan politics play little if any role on the national level, e.g. Haan and Sturm (1994) and others pose that ideological differences are important in determining public policy. In this view left-wing political parties are believed to be more in favor of income redistribution than right-wing parties. In terms of the level of taxation, it is expected that a left-wing government will be more favorable towards a higher tax burden. On the local level, this issue has not been extensively analyzed yet and in particular we are not aware of any study for transition economies. In more mature democracies studies of, among other Allers et al. (2001) for the Netherlands and Borge (1995) for Norway, find that the tax burden is higher in municipalities governed by left-wing authorities. If we believe that left-wing governments are willing to spend more, the hypothesis that referendum is used as an instrument to enlarge disposable local budget will be justified if we find that left-wing councils hold referenda more often than others.

Hypothesis 1 *Left-wing self-governments hold referenda more often.*

Hypothesis 2 *The level of expenditure on refuse removal is higher in municipalities that held referenda on self-imposed taxation.*

If we find evidence to confirm the above hypotheses, it will be a strong suggestion that monopoly power over agenda-setting, which is a result of high initiative cost leads to the use of a local referendum as device to enlarge budgets rather than is driven by efficiency concerns. Moreover, if we find support for the second

hypothesis, it would mean that there are indeed no efficiency gains in terms of costs of refuse collection.

In order to be able to consistently estimate the impact of the referenda we need to treat decision to hold a referendum as endogenous in the regressions. In particular we decided to use a treatment effects model, described in detail below. In order to estimate the effect of treatment we gathered a sample of control observations. We paired each commune in a treatment sample with a similar one, of the same type (urban, rural or mixed) and located in the same county. By this and controlling for diverse characteristics of municipalities we hope to be able to analyze communes, which are very much similar. We believe that location in the same county reasonably well captures the effect of geographical, demographic and sociological characteristics of communes, which we do not take directly into consideration. The data are for years 2001-2009, whereas in treated communes referenda took place in years between these two dates. Therefore, treatment is also analyzed referring to the same commune in the pre-referendum period. We denote a commune as post-referendum only in the next year after referendum took place, to account for time needed to adjust local budgets. The sample of treatment and control observations constitutes a panel of 486 observations. To additionally control for potential differences in communes' characteristics we estimate a version of a model with commune level fixed effects.

We specify a two-equation treatments effect model, in which of primary interest is the referendum effect on expenditure, thus regression

$$y_j = \mathbf{x}_j\beta + \delta z_j + \varepsilon_j \quad (4.1)$$

in which

y_j – expenditure on refuse collection,

z_j – dummy denoting post-referendum years, i.e. treatment,

x_j – a set of controls affecting the level of spending.

The binary decision to obtain the treatment z_j is modeled as the outcome of an unobserved latent variable, z_j^* . It is assumed that z_j^* is a linear function of the exogenous covariates w_j and a random component u_j . More specifically,

$$z_j^* = \mathbf{w}_j\gamma + u_j \quad (4.2)$$

and the observed z_j is

$$z_j = \begin{cases} 1, & \text{if } z_j^* > 0 \\ 0, & \text{otherwise} \end{cases} \quad (4.3)$$

ε_j and u_j are assumed bivariate normal with

$$\begin{bmatrix} \varepsilon_j \\ u_j \end{bmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \sigma^2 & \rho\sigma \\ \rho\sigma & 1 \end{bmatrix} \right)$$

Equations are estimated using full maximum likelihood with robust standard errors. Since we analyze panel data, we estimate both a pooled regression and one with municipalities' fixed effects. Using general-to-specific variable selection we started estimation with the same set of independent variables for both equations. These are summarized in Table 4.3.

Population size, population density, level of income and external subsidies per capita have been identified in the literature as having effect on the level of

Table 4.3: Treatment effects model – description of variables

Variable name	Description
Expenditure	Yearly expenditure on refuse collection per capita
Population	Population of a municipality
Density	Density of population per square km.
Income	Average per capita income of residents
Subventions	Yearly subventions received by the municipality from outside sources per capita
URBAN	Dummy indicating a municipality being defined as urban
LEFT	Dummy indicating if majority in commune council is held by members of a leftist party
ELECTION	A dummy for years in which local election took place
EU	A dummy for years after access to the European Community
Year	Trend effect

local spending (see, e.g. Pommerehne (1983), Feld et al. (2001)) or in particular as affecting costs of refuse removal (see Hirsch (1965) and Bodkin and Conklin (1971)). A dummy for urban municipalities reflects different nature of refuse removal in rural and urban areas. Expenditure might also rise in a year preceding local election, as argued in political budget cycles literature (e.g. Shi and Svensson (2006), Galli and Rossi (2002)). Access to the European Community in 2004 is associated with more strict rules concerning protection of the environment therefore it could positively affect expenditure on the national level, but reports show that due to access to external funding most of these do not have to be borne by local governments anymore. The final model results are presented in Table 4.4

For the purpose of comparison we present below in Table 4.5 results of OLS regression with robust standard errors of the expenditure equation with the same set of independent variables.

Table 4.4: Local referendum effect on refuse collection costs – treatment effects model

	Variable	Pooled		Fixed Effects	
		Coefficient	z-Stat. ^a	Coefficient	z-Stat.
Expenditure equation	Population	-0.0008	(-4.15)***	-0.0007	(-3.77)***
	Income	0.0303	(4.87)***	0.0306	(4.93)***
	Subventions	0.009	(8.53)***	0.009	(8.34)***
	URBAN = 1	16.1963	(3.87)***	16.4742	(3.93)***
	EU = 1	-8.1230	(-2.45)**	-8.1518	(-2.47)**
	TREATMENT = 1	49.9291	(8.38)***	50.2054	(8.38)***
	Const.	-30.1538	(-3.17)***	-27.1128	(-2.81)***
Selection equation	LEFT = 1	0.3761	(1.99)**	0.3475	(1.84)**
	Population	0.0002	(2.15)**	0.0001	(2.19)**
	Income	0.0004	(1.72)*	0.0004	(1.76)*
	Const.	-390.5098	(-7.22)***	-390.4728	(-7.22)***
	ρ	-0.6543		-0.6534	
	σ	34.26102		34.1476	
Wald Test		$\chi^2(1) = 13.34$		$\chi^2(1) = 12.78$	
$H_0 : \rho = 0$		Prob > $\chi^2 = 0.0003$		Prob > $\chi^2 = 0.0003$	
No. of obs.		486			

^aSignificance: *** 1 percent, ** 5 percent, * 10 percent

Table 4.5: Impact of referendum on waste collection expenditure – OLS regression results

Dependent variable	Expenditure	
	Coefficient ^{ab}	t-Stat.
Population	-0.0016	(-6.76)***
Area	0.0683	(2.64)***
Income	0.0375	(5.38)***
Subventions	-0.001	(3.48)***
URBAN = 1	21.9528	(3.46)***
EU = 1	-1.2241	(-0.42)
TREATMENT = 1	17.5093	(4.91)***
Const.	-34.8242	(-3.60)***
	$R^2 = 0.27$	
No. of obs.	486	

^aResults with Robust Standard Errors

^bSignificance: *** 1 percent, ** 5 percent, * 10 percent

As we may observe from comparison on the coefficient on referendum effect on expenditure in Tables 4.5 and 4.4, coefficient obtained with OLS severely underestimates the impact of referendum on level of expenditure. This finding also sheds new light on similar results for other, in particular developing and transitional countries. Direct democracy instruments' choice turns out to be endogenous in case of Poland. Therefore, similar studies for transitional countries, with low level of electoral participation in local politics might be subject to endogeneity bias.

Not all variables that we conjectured should impact expenditures turned out significant. The size of population, the income of residents and the level of external subsidies have signs consistent with the literature on local expenditure determinants. Partisan and pre-election effects also do not play a role in explaining level of expenditure on waste removal, which in this case is justified as this type of expenditure is not be directly related to opportunistic political budget cycles. Results of estimation of the selection equation show that authorities of richer and bigger communes are more willing to hold a referendum on self-taxation. This relation has been noticed by Piasecki (2005), who however did not analyze this in a formal way. Among the variables significant in the selection equation, we observe a positive effect of leftist commune councils for proposing self-taxation referenda. This result supports hypothesis 1.

Striking result is the effect of referendum on the level of expenditure. It is strongly positive and significant. Communes that conducted a referendum, and voters supported state-provided collection of garbage spend on average much more than these in the control sample. It is obvious that direct public spending on collection of refuse from households should increase once this task is performed with public money. The measure of expenditure used in regressions, comprises

however the overall level of expenditure on cleaning activities. Thus, it includes also costs associated with getting rid of waste illegally disposed of by residents, who did not privately contract collection of their garbage, costs of free-riding and associated negative externalities. If there were efficiency gains from collective decision-making in this case, these should be captured by the overall decrease in spending level, which is not the case in our study. Hypothesis 2, therefore also finds reflection in the empirical study. Overall, the fact that leftist local governments hold referenda more often and that the level of spending increases as a result leads to formulation of a following proposition.

Proposition 1 *As a result of high costs of popular initiative local fiscal referenda in Poland do not generate efficiency improvements and serve as a device to enlarge local budgets.*

Under weak electoral control, funding gathered by means of self-taxation might be used for purposes different than financing refuse collection, but this statement suggesting fraudulent use of resources gathered with the use of self-taxation associated with leftist government would require further studies. These results resemble the example of referenda in Oregon school districts (analyzed by e.g. Romer and Rosenthal (1979)), in which authorities use the instrument of referendum to receive larger budgets, while leaving voters with either expenditure level higher than optimal or very low, or in some cases even zero. With low citizen participation in the political process and related weak control of government decisions, the already identified effect of information access, the high cost of popular initiative and apparent relation between leftist local governments and endogenous decision to hold a referendum on fiscal matters the conclusion must be drawn that referenda rather serve bureaucrats expand their budgets than bring

the spending level closer to the socially desired outcome or the median voter ideal level.

4.5 Conclusions

The aim of this paper was to identify and analyze factors that decided that introduction of direct democracy in fiscal decisions in Poland does not lead to improvement in electoral participation in political decisions and electoral control over partisan politics and what follows does not lead to increase in efficiency of fiscal decisions at the local level. By means of analysis of legal provisions and practical interpretation of the act on local referendum with the use of public choice theory, we identified a number of components that lead to preclusion of use of it as an instrument of increasing public participation in political decisions.

Using as a baseline a spatial model of voting we make two conclusions about the cost of popular initiative. First, the high cost of initiative is one of the factors that lead to higher spending on municipal level. This effect arises because voters are unable to effectively control self-government decisions as the threat of a popular initiative, which would turn down level of spending proposed by local authorities, is not credible. Whenever local government's desired spending is higher than the socially optimal level, which we assume to be the median voter outcome, it is only constrained by the mandatory referendum requirement. We also find that the effect of potential for increased spending is slightly eased by high supermajority requirement. The high supermajority requirement in the referendum, though inconsistent with majority requirements for similar issues discussed in the local council, in connection with the limited geographical scope of self-taxation referendum has to be assessed positively. An efficiency oriented legislator, by

this provisions tries to assure efficiency gains at the same time limiting internal costs of decision-making, which increase with the size of community. Thus, from purely theoretical point of view this seems a correct solution.

Unlike other studies, which analyze impact of direct democracy on spending we do not find a decrease in the level of expenditure on communal level. The opposite, use of referenda is found to be associated with overall higher level of spending than in the sample which is used as control. We wanted to account for the fact that referenda in the case of a transitional country with low electoral participation and political culture could be used by bureaucrats as an instrument of budget expansion. Therefore, we treated decision of holding a referendum as endogenous. Results of our studies show that partisan politics seems to play a role in decision on conducting a referendum. Comparison of treatment effects model with OLS estimates shows that the endogeneity hypothesis is justified. We conclude that on average higher spending in municipalities that used referenda is associated with the observed partisan effect. This result also sheds new light on similar OLS regressions ran for other countries, which might also be subject to endogeneity bias. The overall level of spending rises in the treatment group, and from this fact we may conjecture that the efficiency gain from collective decision is not present. We are aware that there are various issues related to nature of exclusion for a service of waste disposal and associated negative externalities, and this topic is subject to further research.

There are diverse ways issues raised in this study can be further analyzed. So far, we focused on only a few aspects of direct democracy impact on economic performance. We did not test whether other economic outcomes associated with direct democracy, and most importantly tax morale level, are also present in case of Poland. The unclear status of tax obligation of self-imposed taxation natu-

rally seems to preclude decreased tax evasion, but this question without a formal analysis is still open. Moreover, due to lack of individual-level data we are not able to assess preferences of the median voter in the analyzed communes, so the argumentation relies on the assumption that the optimal spending level is indeed lower than the one preferred by the authority. Since, as we stated in the introduction work on direct democracy institutions in transitional countries is scarce, it is worthwhile to analyze whether similar economic phenomena are observed in other countries of the region. The overall effect of referenda on fiscal policy of the municipalities is a combination of institutional features and the low interest of voters in politics. A single country case study does not allow us to answer the question of which of the two components is more important for the obtained results. A next step to be taken is a cross-country comparison of similar institutions for other countries in the region. The most interesting problem related to findings of this paper is the issue of endogeneity of a choice of referendum as a fiscal policy-making instrument. We believe that in conditions of weak electoral control and low public interest for politics as observed in transitional countries, one should analyze in a broader way the question of strategic choice of political institutions and their impact of fiscal outcomes.

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Abstract

English Version

The following thesis is a compilation of four papers that analyze diverse aspects of spatial models. Three of them deal with a spatial model of parliamentary elections, whereas in the fourth one we implement a spatial model of voting to analyze the impact of direct democracy on fiscal decisions.

In chapter one we present a comprehensive analysis of the Polish parliamentary elections in 2007 and subsequent formation of the coalitional government and its policy choice from the public choice perspective. On the basis of equilibrium predictions of the valence model we find that for two parties the Downsian behavior is not likely. Moreover, on a basis of the rational voter theory we conclude that abstentions had an unequal effect on the election results of particular parties. Second part of the empirical study deals with the coalitional behavior, and again we find non-Downsian behavior of the LiD party. The uncovered set and the Schattschneider set are analyzed in comparison with the pension system reform conducted in 2007-2009. It turns out that theoretical predictions made with the use of cooperative game theoretical concepts correspond well to the actual policy choice.

In the second chapter we show how the choice of methodology for the esti-

mation of party positions impacts the conclusions about equilibrium positions of parties in a spatial model. We find that for the same set of voters' ideal points we should observe either divergence or convergence to the mean, depending on the choice of party positions' estimates.

In the third chapter we test the impact of campaign finance regulations, introduced to decrease the influence of special interest groups on parties' platforms. On a basis of predictions of the valence model and using a cross-country sample of 47 countries, we find that public funding of parties leads to divergence in platforms along the main electoral axis, whereas ceilings on individual contributions cause platforms to converge. These effects are caused by the impact of differences in valence among the parties. We also find unexpected divergence related to a ban on corporate donations and the public disclosure of income statements.

The final chapter contains an analysis of local referendum on self-imposed taxation in Poland. We provide a detailed description of this direct democracy institution. Moreover, we assess its consequences with regard to the fiscal policy of communes. On the base of the high costs of initiative and the low access to information on the side of the public, we argue that such a referendum does not lead to increased voter participation in local decision-making. Moreover, we find that due to the high costs of initiative, local authorities are given a *de facto* monopoly power over the agenda-setting. As a result, the considered referendum does not lead to a more efficient provision of public service, but serves as a mean of budget expansion for bureaucrats.

German Version

Bei der vorgelegten Arbeit handelt es sich um kumulative Dissertation. Sie besteht aus vier Essays die unterschiedliche Aspekte der politischen Ökonomie beleuchten. Jeder Essay entspricht einem Kapitel. Die ersten drei Kapitel befassen sich mit räumlichen Wettbewerb bei Parlamentswahlen. Das letzte Kapitel analysiert den Einfluss direkter Demokratie auf fiskalpolitische Entscheidungen im Modell räumlichen Wettbewerbs.

Das erste Kapitel enthält eine umfassende Analyse der polnischen Parlamentswahlen in 2007 und der nachfolgenden Koalitionsverhandlungen. Zielsetzung ist mit Hilfe eines Modells räumlichen Wettbewerbs den Ausgang der Koalitionsverhandlungen zu prognostizieren. Der erste Teil beschäftigt sich mit dem Wahlergebnis. Ausgehend von Prognosen des Valence-Modells stellt sich heraus, dass zumindest für zwei Parteien die Downs' Hypothese nicht zutreffend ist. Geht man von der Hypothese rationalen Wahlverhaltens aus, zeichnet sich außerdem ab, dass Stimmenthaltungen sich unterschiedlich auf den Wahlerfolg einzelner Parteien auswirken. Der zweite Teil versucht eine Prognose des Ausgangs der Koalitionsverhandlungen. Im Falle der LiD Partei ist strategisch Verhalten höchstwahrscheinlich. Der abschließende Teil behandelt die Reform des Rentenversicherungssystems von 2007 bis 2009. Eine Analyse mittels "Uncovered Set" und Schattschneider-Menge zeigt, dass die Prognosen kooperativer Spieltheorie den gegenwärtigen Politikentscheidungen entsprechen.

Das zweite Kapitel diskutiert Verfahren zur Schätzung der Positionierung von Parteien im politischem Spektrum. Es zeigt sich, dass die Wahl des Verfahrens direkten Einfluss auf die geschätzten Gleichgewichtspositionen der Parteien in einem Modell räumlichen Wettbewerbs hat. Für identische optimale Position-

ierung aus Wählersicht ergibt sich je nach Wahl des Verfahrens Divergenz oder Konvergenz von der Mitte des Spektrums politischer Präferenzen.

Untersuchungsgegenstand des dritten Kapitels sind gesetzliche Vorschriften zur Wahlkampffinanzierung. Im Fokus steht deren Wirksamkeit im Hinblick auf die Bekämpfung von Lobbyismus. Getestet werden diverse Hypothesen, welche aus dem Valence-Modell abgeleitet wurden. Der empirischen Analyse liegt ein Querschnittsdatensatz mit Beobachtungen zu 47 Ländern zugrunde. Es stellt sich heraus dass öffentliche Parteienfinanzierung zu Divergenz im Hinblick auf die strategische Ausrichtung von Parteien führt. Höchstbeträge auf individuelle Spenden führen dagegen zu Konvergenz. Diese Ergebnisse fassen auf Unterschiede in der vom Wähler wahrgenommen Wertigkeit der Parteien abseits der politischen Agenda. Überraschenderweise zeigt sich auch, dass ein Verbot von Firmenspenden und die Offenlegung der Parteienfinanzierung zu Divergenz führen.

Das vierte und letzte Kapitel befasst sich mit der Analyse eines lokalen Referendums zur freiwilligen Besteuerung in Polen. Zunächst erfolgt eine ausführliche Schilderung dieses Elements direkter Demokratie und möglicher Konsequenzen auf lokale Fiskalpolitik. Ausgehend von dem hohen Partizipationskosten der Bürger und der geringen Verfügbarkeit von Informationen argumentieren wir, dass das lokale Referendum zur freiwilligen Besteuerung nicht zu höherer Beteiligung an Bürgerentscheiden auf lokaler Ebene führt. Zudem stellt sich heraus, dass lokale Behörden über eine de facto Monopolmacht im Hinblick auf die politische Agenda verfügen, welche aus den hohen Kosten für bürgerliche Initiativen resultiert. In Konsequenz führt das betrachtete Referendum nicht zu einer effizienteren Bereitstellung öffentlicher Güter, aber dient zur Ausweitung der Bürokratie.

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University of Vienna – Department of Economics

2006 - 2008 Master studies in the field of Economics (*Magisterstudium*

Volkswirtschaftslehre)

Master of Social and Economic Sciences (*Magistra der Sozial- und Wirtschaftswissenschaften*), with honors („mit Auszeichnung bestanden“)

Topic of the master thesis: „Spatial competition in Polish elections”

Warsaw University – Faculty of Economic Sciences

2006 - 2008 Master studies in the field of International Economics

Master of Arts in International Economics, summa cum laude

In cooperation with University of Vienna – CEEPUS program

2003 - 2006 Bachelor studies in the field of Econometrics and Information Science,
summa cum laude

Topic of the bachelor thesis: „The impact of human capital on economic growth”

Warsaw University – Faculty of Law and Public Administration

2006 - 2008 Master studies in the field of Law

High school

1999-2003 2 Społeczne Liceum Ogólnokształcące in Warsaw, with honors

Teaching Experience:

SS2009 Tutor for Industrial Economics for master students of economics

WS2009 Tutor for Introduction to Economics for undergraduate students of economics

SS2010 Tutor for Industrial Economics for master students of economics

WS2010 Tutor for Introduction to Economics for undergraduate students of economics

Administrative Experience:

2009 Organization of a workshop and a public lecture

“The Financial Crisis – The End of Globalization?”

Responsible for the contact with the sponsor and invited speakers and other promotional duties

Research interests and publications:

Peer-reviewed publications:

Turyna, M., (2010) Spatial Analysis of the Polish Parliament 2007–2010, *Politics in Central Europe* 6(2), pp. 40–77

Chapters in books:

“Metody ilościowe w zarządzaniu” [in:] *Decyzyjne systemy zarządzania*, ed. Jerzy Kisielnicki, in print

Current research:

Public choice, political economy, law and economics

“Estimation of Party Positions: A Comment on Schofield and Zakharov (2010)”, revise and resubmit – Public Choice

“Campaign Finance Regulations and Policy Convergence: The Role of Interest Groups and Valence”, working paper

“Failure of direct democracy implementation: a case study of local referenda in Poland” with Grzegorz Goleń, working paper

“Duverger’s Law revisited: The effect of elections’ proportionality on the number of parties and their positions”, working paper

Conference participation:

2011 Public Choice Society Meeting, San Antonio (TX)

Presentation: “Campaign Finance Regulations and Policy Convergence: The Role of Interest Groups and Valence”

2011 4th RGS Doctoral Conference, Dortmund

Presentation: “Campaign Finance Regulations”

2010 Quantitative Economics Jamboree 2010, Alicante

Presentation title: „Financing Political Parties”

Foreign languages:

Polish: native

English: fluent

German: fluent

Italian: communicative

Danish: communicative

French: basic

References:

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