announced on 24 August that a new legislative election would be held on 1 November. As prescribed by the Constitution in case of the absence of a government in the lead-up to an election, a provisional election cabinet was formed on 28 August. The Constitution stipulates that the provisional government must include members from all parties in the parliament in accordance with their seat shares. Arguing that Davutoğlu was under the tutelage of Erdoğan who violated the constitutional constraints many times since the elections, the CHP and the MHP refused to join the government. Hence the cabinet led by Davutoğlu consisted of 11 ministers from the AKP, 2 ministers from the HDP, a rebel MHP MP, and 11 independent ministers. The MHP soon expelled its rebel MP who accepted Davutoğlu's invitation to take part in the cabinet whereas the two ministers from the HDP resigned on 22 September on the grounds that the government was pursuing aggressive policies against Kurdish people.

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Only conservatives are voting in the rain: Evidence from German local and state elections

Felix Arnold [a, b, *], Ronny Freier [a, b]

[a] DIW Berlin, Mohrenstraße 58, 10117 Berlin, Germany
[b] FU Berlin, Garystraße 21, 14195 Berlin, Germany

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ABSTRACT

In this note, we use data from different elections in the German state of North-Rhine Westphalia between 1975 and 2010 to show that the Conservatives profit from lower voter turnout at the expense of the Social Democrats. We deal with the endogeneity of voter turnout by using election day rain as an instrumental variable. Our particular contribution is the comparison of municipal and state elections.

1. Introduction

The quality of a democracy is often judged by how many people go to vote. High turnout is interpreted as a signal for satisfaction with the democratic system and many organizations state the

* Corresponding author. DIW Berlin, Mohrenstraße 58, 10117 Berlin, Germany.
E-mail addresses: farnold@diw.de (F. Arnold), rfreier@diw.de (R. Freier).

Table 1
Related literature: rain on election day.

Paper	Country	Election	Time frame	Rain on turnout	Main finding	Method
Panel 1: *rain as an explanatory variable*						
Eisinga et al. (2012)	Holland	Federal	1971–2010	$-^{***}$	Rainfall depresses turnout by a rate of one half percent per centimeter	RE
Fraga and Hersh (2010)	United States	Presidential	1948–2000	$-^{***}$	Rain depresses turnout on average, but not in close elections	RE, FE
Gomez et al. (2007)	United States	Presidential	1948–2000	$-^{***}$	Election day rainfall reduces turnout in a county at roughly 0.8% per inch	RE
Knack (1994)	United States	House	1984–1988	$-^{0}/+^{0}$	No effect of rain on turnout or on partisan outcomes	Logit
Arnold (2015)	Germany (Bavaria)	Mayoral	1946–2009	$-^{***}$	Rainfall reduces turnout on average, but not if the race is close	FE
Persson et al. (2014)	Sweden	Federal	1976–2010	$-^{0}/+^{0}$	No significant effect of rain on turnout is found in three Swedish datasets	OLS
Shachar and Nalebuff (1999)	United States	Presidential	1948–1988	$-^{**}$	Electoral closeness stimulates party leaders' effort and thereby increases turnout; rain negatively impacts turnout	Structural model
Panel 2: *rain as an instrumental variable*						
Artés (2014)	Spain	Federal	1986–2011	$-^{***}$	Conservatives are hurt by higher turnout whereas other smaller parties gain in terms of vote share	IV
Hansford and Gomez (2010)	United States	Presidential	1948–2000	$-^{***}$	Higher turnout helps the Democrats, harms the incumbent, and makes vote shares less predictable	IV
Lind (2014)	Norway	Municipal	1972–2010	$+^{***}$	Higher turnout hurts the left wing parties	IV
Lo Prete and Revelli (2014)	Italy	Mayoral	2001–2010	$-^{0}$	Higher voter turnout has a negative effect on city performance and the valence of mayors	IV

Notes: − stands for a negative effect, + for a positive effect. Stars denote the usual level of significance. A zero marks an insignificant effect.
* denotes significance at the 10% level. ** denotes significance at the 5% level. *** denotes significance at the 1% level.
Source: Own Research.

promotion of electoral participation as a goal. But what are the consequences of higher turnout regarding election outcomes? How is the distribution of vote shares affected? Which parties (if any) profit from higher turnout?[1]

We examine the partisan effects of voter turnout in the German state of North-Rhine Westphalia between 1975 and 2010. Our contribution is threefold. First, we are first to document partisan effects for Conservatives and Social Democrats in Germany – two parties for which, given differences in voter composition, we would a priori expect large effects. Second, we compare the effects at different tiers of government (municipal and state elections) within the same institutional framework. Third, we survey the literature and compare the effects to other countries.

Importantly, we address the endogeneity of voter turnout by using election day rain as an instrumental variable (IV).[2] Our findings suggest that a one percentage point increase in voter turnout significantly increases Social Democratic vote shares by 0.76 (0.69) percentage points in municipal elections (state elections) and decreases Conservative vote shares accordingly. The IV estimates are much larger than conventional OLS estimates, suggesting that failing to address the endogeneity of voter turnout can lead to substantial bias. In the first stage, the effect of rain is significantly more pronounced in local elections compared to state elections, something that is consistent with the calculus of voting. The second stage effect of turnout on party vote shares, however, is comparable in size for the two tiers. The effects are larger than results for the US, but similar in size to estimates for some other European countries.

Our work relates to the literature on partisan effects of voter turnout (Martinez and Gill, 2005; Knack, 1994; Hansford and Gomez, 2010; Nagel and McNulty, 1996) and to the literature on election day weather and voter turnout (Gomez et al., 2007; Shachar and Nalebuff, 1999; Fraga and Hersh, 2010).[3] These studies focus on the US, where it seems to be an empirical regularity that Democrats profit from higher turnout rates while Conservatives suffer. For Europe, evidence is more scarce, although partisan effects studies have been conducted for Spain (Artés, 2014), Italy (Lo Prete and Revelli, 2014) as well as Norway (Lind, 2014) and the effect of inclement weather on voter turnout has been investigated for the Netherlands (Eisinga et al., 2012) as well as Sweden (Persson et al., 2014). Table 1 in the appendix summarizes the literature on election day rain and turnout.[4]

2. Data and empirical strategy

We collected panel data on all municipal and state elections in North-Rhine Westphalia, Germany's most populous state, between 1975 and 2010. For each of the 396 municipalities, we observe 16 election outcomes: eight municipal council and eight state parliament elections. On both levels, one electoral term lasts 5 years.

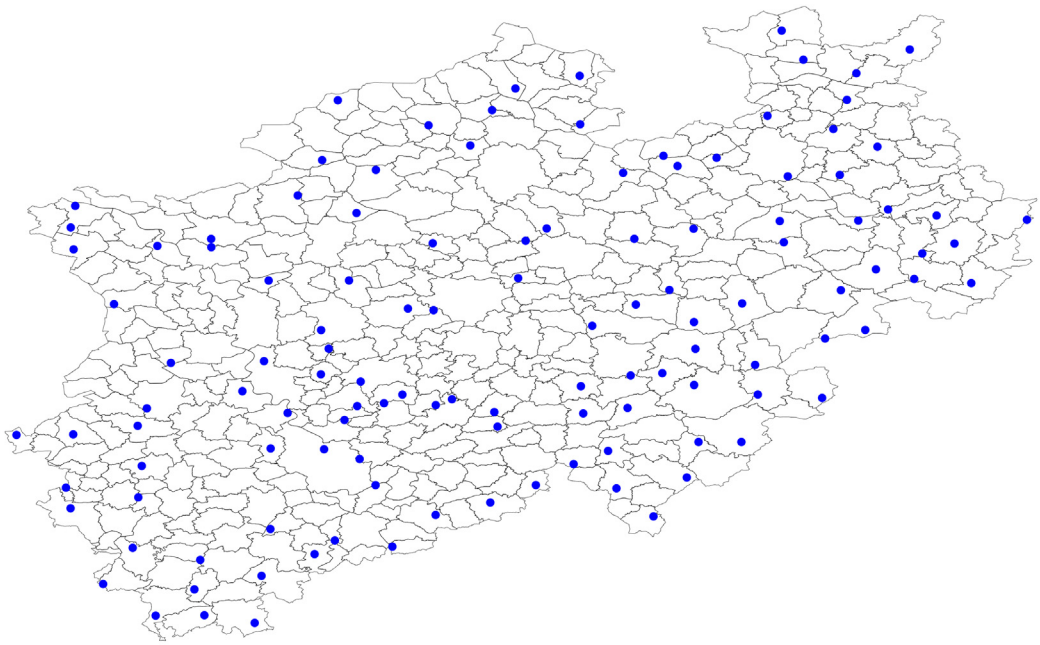
The political landscape in North-Rhine Westphalia is dominated by two major parties: The Conservatives *Christlich-Demokratische Union* (CDU) and the Social Democrats *Sozialdemokratische Partei Deutschlands* (SPD). In our sample, these two parties together get more than 80 percent of the total vote. Smaller parties like the

[1] The effects of voter turnout are an ongoing subject of debate in the academic literature. For recent contributions, see Michelsen et al. (2014); Pelkonen (2012); Jewitt (2014); Bhatti and Hansen (2013); De Paola and Scoppa (2014) as well as Martins and Veiga (2013).

[2] Turnout may be endogenous due simultaneity considerations: If parties carry out mobilization efforts, causality also runs in the opposite direction.

[3] Our note also provides crucial evidence for the literature on close election RDDs (work for Germany include Ade and Freier (2013); Ade et al. (2014); Freier (2015); Freier and Odendahl (2015)), in which weather conditions are argued to provide one source of election outcome randomness.

[4] In a companion paper, Arnold (2015) investigates the effects of electoral closeness on turnout. This paper also uses rainfall to investigate interaction effects of electoral closeness and other driving forces on turnout.



Notes: This map presents the spatial distribution of the 121 weather stations in North-Rhine Westphalia used in this analysis. The black lines depict the borders of all 396 municipalities. Each blue dot stands for a weather station.

Fig. 1. Weather stations in North-Rhine Westphalia.

Greens (*Bündnis 90/Die Grünen*), the Liberals (*FDP*) or the Left Party (*Die Linke*) account for the rest of the vote. Importantly, the voters of Social Democrats and Conservatives are clearly divided with pensioners and high-income voters favoring the Conservatives and young families as well as the working-class favoring the Social Democrats (Thaidigsmann, 2004). It is this relatively clear division that may motivate strong partisan effects of turnout.

The precipitation data were obtained from the German Weather Service (*Deutscher Wetterdienst*, *DWD*). The state-run DWD maintains a grid of several thousand weather stations across Germany.

Table 2
Summary statistics.

Variable	Mean	Std. Dev.	Min.	Max.	N
Panel 1: *municipal elections*					
Election data:					
SPD vote share	0.34	0.11	0.04	0.67	3162
CDU vote share	0.47	0.11	0.14	0.85	3165
Turnout	0.71	0.12	0.42	0.94	3165
Eligible Voters	32992.9	65953.14	2353	764,876	3165
Share Elderly	0.15	0.03	0.08	0.3	3168
Weather data:					
Rain (mm)	1.6	4.23	0	25.8	3087
No rain	0.53	0.5	0	1	3168
Average rain (mm)	2.75	1.27	0.22	7.26	3089
Distance to next weather station (km)	7.83	4.18	0.63	21.17	3168
Panel 2: *state elections*					
Election data:					
SPD vote share	0.39	0.11	0.09	0.72	3168
CDU vote share	0.46	0.12	0.2	0.88	3168
Turnout	0.71	0.09	0.48	0.89	3168
Eligible voters	32424.24	64355.06	2463	705,339	3168
Share elderly	0.15	0.03	0.08	0.3	3168
Weather data:					
Rain (mm)	1.69	3.75	0	36.3	3113
No rain	0.61	0.49	0	1	3168
Average rain (mm)	1.88	0.57	0.61	4.25	3113
Distance to next weather station (km)	7.83	4.18	0.63	21.17	3168

Notes: The tables highlights the descriptive statistics for the two independent samples of municipal elections (Panel 1) and state elections (Panel 2).
Source: Own calculations.

Table 3
Main results.

Dependent variable:	(OLS)		(IV)		(OLS)		(IV)	
	SPD	SPD	Turnout	SPD	CDU	CDU	Turnout	CDU
Panel (1): municipal elections								
Turnout	0.335***	0.325***		0.755***	−0.381***	−0.380***		−0.851***
	(0.041)	(0.042)		(0.253)	(0.046)	(0.049)		(0.254)
Rain in mm		−0.004	−0.012***			0.006*	−0.012***	
		(0.003)	(0.002)			(0.003)	(0.002)	
			[26.25]				[26.21]	
N	3162	3081	3084	3081	3165	3084	3084	3084
R^2	0.57	0.57	0.95	0.54	0.49	0.50	0.95	0.46
Panel (2): state elections								
Turnout	0.069*	0.063		0.694***	−0.107***	−0.099**		−0.548**
	(0.038)	(0.038)		(0.258)	(0.040)	(0.041)		(0.262)
Rain in cm		−0.006***	−0.005***			0.003*	−0.005***	
		(0.002)	(0.001)			(0.002)	(0.001)	
			[16.67]				[16.67]	
N	3168	3113	3113	3113	3168	3113	3113	3113
R^2	0.80	0.80	0.96	0.75	0.83	0.83	0.96	0.81

Notes: Standard errors in parentheses, first stage F-Test statistics in square brackets. Standard errors are robust to heteroscedasticity. Significance Levels: *p < 0.10, **p < 0.05, ***p < 0.01. The data cover all local and state elections in the 396 municipalities of North-Rhine Westphalia between 1975 and 2010. Municipal and year fixed effects, a third order population polynomial and the share of elderly people are included as controls in each specification. Additionally, all models include a control for average rain on election day. The coefficient of the original variable*Rain in mm* has been multiplied by 10 to ease readability. We therefore denote the variable to relate to rain in cm.
Source: Own calculations.

We employ data from all 121 weather stations in North-Rhine Westphalia that consistently reported data between 1975 and 2010. Each municipality is assigned to the closest weather station.[5] We thus employ variation in rain showers across time and space. Average municipality-station distance is 7.83 km Fig. 1 shows a map of North-Rhine Westphalia with the location of all weather stations used in the analysis.

Descriptive statistics of all variables can be found in Table 2, separate by election type. The CDU is somewhat stronger than the SPD in terms of vote share, with a smaller difference for state elections. Turnout is at 71 percent on average. The smallest municipality has 2353 eligible voters, while Cologne has more than 750,000 eligible voters. The share of elderly people (those above the legal retirement age of 65) is approximately 15 percent. Average rain on election day is similar for both election types and at about 1.6–1.7 mm.[6] The variation in this measure is quite high, however. In 53 percent of all municipal elections, it did not rain at all. Conditional on some rain at all, average rain on election day then increases to $1.6/0.53 = 3.02$ millimeters.

To estimate a causal effect of turnout on party vote shares, we employ an instrumental variable approach. Turnout is instrumented by election day rain. For this to be a valid design, two conditions need to be fulfilled: First, rain has to have a significant impact on turnout. This condition of instrument relevance is testable. Second, rain must not affect party vote shares through any other channel except turnout. That is, rain is exogenous in the outcome equation. This condition of instrument exogeneity is not testable. However, given that rainfall is essentially random, we can think of no reason why this assumption should not hold.

To be more precise, in the first stage we estimate the following relationship

$$T_{itj} = \alpha_{1j} + \beta_{1j} R_{itj} + X'_{itj}\gamma_{1j} + \theta_{ij} + \tau_{tj} + u_{itj}, \quad (1)$$

where T is turnout, R is rain on election day[7] (measured in millimeters), X is a vector of covariates, θ and τ are municipal and year fixed effects and u is an error term. The indices i and t stand for municipalities and (election) years, respectively. We run separate regressions for each election level, such that $j = \{$Municipal Election, State Election$\}$.

In the second stage, we estimate

$$VS^p_{itj} = \alpha_{2j} + \beta_{2j}\widehat{T}_{itj} + X'_{itj}\gamma_{2j} + \theta_{ij} + \tau_{tj} + \varepsilon_{itj}, \quad (2)$$

where VS^p is the vote share of party p ($p = \{$SPD,CDU$\}$), $\widehat{T}$ are the fitted values from the first stage and ε is an error term.

The coefficients of interest are β_1 (Does rain affect turnout?) and β_2 (What are the partisan effects of voter turnout?). The vector of controls X includes a third order population polynomial, the share of elderly people and average rain on election day.

3. Results

Table 3 holds the main results. We estimate separate models for SPD and CDU vote shares. Furthermore, we compare the baseline OLS estimate with the IV approach for each case. Panel (1) includes the results for municipal elections whereas Panel (2) focuses on state elections.

The following interpretation refers to municipal elections, i.e. Panel (1). Column (1) and (2) show a positive and significant correlation between SPD vote shares and voter turnout (with and without rain as a confounding variable). To evaluate whether this effect is causal, we resort to our IV estimates. Column (3) holds the

[5] The distance between municipality and closest weather station is calculated with the STATA package -geonear-. This routine returns the "nearest neighbor" for each municipality, where potential "neighbors" are all weather stations in North-Rhine Westphalia. The location of the municipality is defined as the area centroid and the location of the weather station is a single point (defined by latitude and longitude).

[6] This remarkable similarity is unexpected because of seasonal differences: Municipal elections take place in late September/early October whereas state elections happen in May.

[7] In addition, we include a dummy that takes the value 1 if it did not rain at all on election day. We also experimented with a quadratic rain term, but the results turned out to be insignificant.

first stage results. One can see that election day rain significantly reduces voter turnout. The point estimate suggests that 10 mm of rain reduce turnout by 1.2 percentage points.[8] The first stage F-statistic of more than 26 suggests that the instrument is highly relevant. Column (4) holds the results from the second stage, where voter turnout is replaced with the fitted values from the first stage. The IV coefficient is twice as large as the OLS coefficient and highly significant.[9] It is estimated that a one percentage point increase in voter turnout increases SPD vote shares by 0.76 percentage points.

Analogous results for CDU vote shares can be found in columns (5)–(8). While the Social Democrats seem to profit from higher turnout rates, the Conservatives fare worse when electoral participation is higher. The IV estimate in column (8) suggests that a one percentage point increase in voter turnout translates into a 0.85 percentage point decrease in CDU vote shares.

A validation of these findings is provided in Panel (2), where we estimate exactly the same relationships for a different set of elections within the same municipalities. We find that also in state elections, the SPD gains and the CDU loses in terms of vote shares when turnout is higher. The effects are only insignificantly smaller and generally consistent with prior results in terms of sign and significance. The fact that we find similar effects for turnout in two different sets of elections and on two levels of government makes it more plausible that the results are generalizable. A note is also warranted on the comparison of the first stage effects in the two different tiers of government. Rain exerts a significantly more pronounced effect in municipal elections compared to state elections, something that we believe is consistent with the calculus of voting (Downs, 1957; Riker and Ordeshook, 1968). We presume that the probability of being pivotal is quite similar (average election district size is about the same). As more is at stake in state elections this should make the benefits of voting larger at the state level. Now, we view rain as a cost shifter in the calculus of voting. The induced costs of rain should be similar in municipal and state elections, however, for municipal elections it is more often that the shift in costs (rainfall) induces people to forfeit the benefits of voting. Note that the fact that the first stage is smaller in the state elections does not have consequences on the interpretation of the second stage effects. The similarities in the second stage effects, despite the differences in the first stage, speak further to the general nature of the turnout – partisan vote share relationship.

The control variables also merit a short discussion. We include municipal fixed effects in all models we estimate, using only the within variation in the data. Electorate-specific unobserved heterogeneity (like political culture, historical strength of a certain party, etc.) is thus implicitly controlled for. Furthermore, we control for location-specific precipitation patterns by including average rain on election day as a control variable. Amounts of rain above (or below) this average cannot be anticipated by the public and therefore act as an exogenous cost (benefit) on the act of voting. Controlling for population size accounts for the fact that turnout is generally lower in larger electorates (Geys, 2006). The year dummies capture the downward trend in turnout rates that is common to Western democracies (Gentzkow, 2006).

We show the results from six additional robustness and supplementary tests in an online appendix. The first part explains in more detail how we assigned towns to the closest weather station and what happens when we artificially decrease the number of weather stations to obtain a less fine grid. Part two shows that the main effects in the municipal elections are driven by small towns (with small electoral districts) and that the effects are more similar by town size in the state elections (where the district sizes are more equal). We also show the rain effects on other parties in part three, notifying the reader that such an analysis is more complicated because of missing values in many towns (and as such less efficient). Moreover, we show the full model (including all control variables) and discuss the impact of early voting (in more recent years), providing additional material on the first stage effects in different time periods. Finally, we address a potential concern that higher turnout does not hurt a specific party, but the incumbent party, something that is not supported by our data.[10]

4. Conclusion

In this note, we show that – in a setting of elections on different levels in Germany – Social Democrats profit from higher turnout rates whereas Conservative vote shares decline if electoral participation increases. The endogeneity of voter turnout is addressed by using election day rain as an instrumental variable. Reassuringly, the general nature of this effect is confirmed in two independent sets of elections at different levels of government.

Generally, our findings are mostly in line with research from the United States, where Democrats profit from higher turnout rates (Gomez et al., 2007; Hansford and Gomez, 2010). However, in comparison to earlier findings, our first stage effects are quite large: Hansford and Gomez (2010) estimate that an inch of rain ($\approx$25 mm) reduces turnout by a bit more than one percentage point – rendering our effects almost twice as large. While we can only speculate on the reasons for this, two potential explanations could be relevant. First, we have a much denser grid of weather stations that may allow for less measurement error in the rain variable. Second, in the US, Republican and Democratic voters may not be as strongly divided by income as poor minority groups favor Democrats but the poor white working class is also often inclined to vote for the Republicans.

Our results are informative insofar as they confirm conventional wisdom and help understanding observed politician behavior in recent elections. For example, German chancellor Angela Merkel (a member of the conservative CDU) has become well-known for her election campaign strategy of “asymmetric demobilization” (Denkler, 2012). By avoiding statements on controversial issues and holding still, the CDU prevents Social Democratic voters from getting engaged. Furthermore, the CDU puts core Social Democratic issues like minimum wages on its own agenda, weakening potential SPD voters' reasons to go vote. These actions also imply weak mobilization of the own clientele, but demobilization of the opposing political camp – potentially due to known differences in the clientele's characteristics[11] – is larger. It is hence “asymmetric”. The result is an overall lower turnout rate that helps the Conservatives win elections.

[8] In terms of elasticities, this effect seems rather small: A one standard deviation increase in rain (+4.32 mm) reduces turnout by $4.32 \cdot 0.0012 \approx 0.5$ percentage points, which corresponds to $\frac{0.005}{0.12} \approx 4$ percent of a standard deviation in this variable.

[9] When we compare the IV (consistent model) against OLS (efficient model under H0) in a Hausman endogeneity test, we fail to reject the null hypothesis of no systematic difference between OLS and IV coefficients. This is partly surprising, as the coefficients of the two models are quite different. Due to these large differences, we opt to still favor the IV over the OLS. Note that we also tested additional weak identification and underidentification tests (Cragg Donald Wald F and the Kleibergen Paap LM) and all come out in favor of our IV.

[10] See Bechtel and Hainmueller (2011) for an account of how extreme weather events and subsequent policy action can benefit the incumbent party.

[11] This also links our work to the known turnout effects of increased social inequality, see Schäfer (2012).

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.electstud.2015.11.005.

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The parliamentary election in Poland, October 2015

Kamil Marcinkiewicz [a, *], Mary Stegmaier [b]

[a] Universität Hamburg, Institut für Politikwissenschaft, Allendeplatz 1, 20146 Hamburg, Germany
[b] Truman School of Public Affairs, University of Missouri, USA

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1. Introduction

The October 25, 2015 Polish parliamentary election revealed new dynamics in the Polish party system. The right-wing Law and Justice party (PiS) became the first party since 1989 to secure an absolute majority of seats in the lower house of parliament, the Sejm. The coalition parties that governed over the past eight years, the centrist Civic Platform (PO) and the agrarian Polish People's Party (PSL), lost substantial support and now serve in opposition. The left-of-center parties, the Democratic Left Alliance (SLD) and Your Movement (TR), which ran together as the United Left (ZL), lost their parliamentary representation completely, while two new groups entered the parliament, the liberal Nowoczesna and the populist Kukiz'15.

2. Background

The PO-PSL coalition that governed from 2007 to 2015 was led by the PO, with Donald Tusk as Prime Minister (PM) from 2007 to 2014, followed by Ewa Kopacz as PM until 2015. Tusk came to power promising stability after two years of chaotic PiS-dominated cabinets led by Jarosław Kaczyński and Kazimierz Marcinkiewicz (Gwiazda, 2008; Millard, 2007). Tusk formed a stable coalition with the PSL and during his first term earned high approval ratings by avoiding controversial decisions. As a response to the political influence exerted on the judiciary under the PiS-led government, the

* Corresponding author.
E-mail addresses: kamil.marcinkiewicz@wiso.uni-hamburg.de (K. Marcinkiewicz), stegmaierm@missouri.edu (M. Stegmaier).