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influence of inter- and intra-party
competition on allocation of discretionary
investment grants in Poland

Łukasz Wiktor Olejnik and Marcin Grygo

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The influence of inter- and intra-party competition on allocation of discretionary investment grants in Poland

Łukasz Wiktor Olejnik¹

Marcin Grygo²

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Abstract

To date, there have been dozens of publications confirming the existence of alignment bias or hometown bias in the allocation of intergovernmental grants. However, the assumption is typically made that members of one party support one another in principle. Meanwhile, in proportional systems, candidates from one party compete with one another for a seat in parliament, which may affect the distribution of grants. This paper analyses the distribution of investment grants to local governments from the Polish Covid-19 Response Fund in 2021-2023. It presents results suggesting that if the distribution of discretionary investment grants is controlled by the members of a single party faction, local governments with ties to the hometowns or birth towns of members of parliament (MPs) representing that faction receive significantly more funding than other local governments. The hometowns or birth towns of opposition members receive significantly lower grants, while the hometowns or birth towns of politicians from the opposite faction of the ruling party receive the lowest grants. This supports the hypothesis that intra-party rivalry and the desire to reduce the re-election chances of rivals can have a powerful impact on the distribution of discretionary grants.

Keywords: alignment bias, hometown bias, core vs. swing voters hypothesis, intra-party competition

JEL codes: D72, H72, H79

¹ Corresponding author. SGH Warsaw School of Economics, Poland. E-mail address: lolejn@sgh.waw.pl (Ł. W. Olejnik). ORCID: 0000-0002-4250-961X.

² Institute of Public Finance, SGH Warsaw School of Economics, Poland. E-mail addresses: marcin.grygo@ifp.org.pl, mg89616@student.sgh.waw.pl (M. Grygo). ORCID: 0009-0002-4403-5427.

1. Introduction

The normative theory of public finance and fiscal federalism posits that the government is driven by a desire to maximise social welfare, akin to that of a "benevolent planner" seeking the common good. In a system of multi-tier government, grants to local government are designed to address vertical fiscal imbalance between tiers of government and safeguard horizontal fiscal equity among jurisdictions (see e.g. Musgrave 1959). These grants are justified and economically effective because local governments have a superior understanding of local needs, preferences, and cost functions than the central government (Oates 1972). Furthermore, the rule-based distribution of grants acts as a political constraint for the central government, preventing it from providing more generous outputs in one jurisdiction than in another.

What are the implications for social welfare if the objective of elected officials is not to maximise it, but rather to secure re-election? The second generation of theory of fiscal federalism is based on the assumption that participants in political processes (both voters and politicians) have their own objective functions that they seek to maximise within the constraints of the political setting (Oates, 2005). Politicians may be primarily focused on winning elections, rather than on pursuing the common good. Voters may be motivated to cast their ballots for politicians who can provide them with more public resources rather than focusing on the maximisation of welfare of the entire society. High levels of political polarisation among voters may result in a weakening of the political constraints that prevent the government from engaging in political favouritism. This could manifest as a trend to allocate resources to those who typically vote for the ruling party, even if it is at the expense of those who typically vote for the opposition.

Political motives in resource allocation can lead to politicians using the allocation of public resources to increase their chances of gaining or retaining power. To date, there have been dozens of papers confirming the existence of a situation where the central government allocates more subsidies to local governments where the same party is in power, known as alignment bias (see Solé-Ollé and Sorribas-Navarro 2008; Arulampalam et al. 2009; Bracco et al. 2015; Kauder et al. 2016, among others). Other papers have focused on demonstrating hometown or birth town biases, a situation in which politicians in power transfer more public resources to the regions of their origin or residence (see, *inter alia*, Golden and Picci 2008; Hodler and Raschky 2014; Jennes and Persyn 2015). Many papers have also tested whether politicians transfer more resources to their core voters or to swing voters (Cox and McCubbins 1986; Dixit and Londregan 1996; Kauder et al. 2016; Gonschorek et al. 2018). However, all these papers addressed these phenomena separately, whereas in reality, the final allocation of public resources may be the result of all of them at once.

Moreover, the vast majority of research is based on the assumption that politicians from the same party support one another. This is understandable in some respects, as electoral victory is the result of teamwork between all the politicians in a party. However, politicians within the same party do compete with each other - for leadership of the party, for popularity within the electorate, for better positions in government, etc. Particularly in countries with proportional representation, politicians standing on the same list compete for the better result, which guarantees a seat in parliament. So what happens when one faction in a party is responsible for distributing discretionary investment grants and is in fierce competition with another?

In Poland, a debt-financed programme of large investment grants was introduced between 2021 and 2023. From the Covid-19 Response Fund, the central government granted local governments a total of PLN 110.3 billion (around EUR 26.3 billion) in grants for local investment, which together amounted to around 3.61% of the average Polish GDP in 2021-2023. These grants have been awarded in a highly non-transparent and discretionary manner. In its post-audit conclusions, the Supreme Audit Office (Poland's independent public administration audit body) pointed out that at the stage of considering investment applications, the Commission did not develop a uniform evaluation mechanism, no justification was provided for the decisions taken, no minutes were kept of the Committee's meetings, and no provision was made for appealing to the Court against decisions taken after the results had been announced. Moreover, committee meetings were so short that committee members had less than 16 seconds per decision. Political motives in the allocation of resources from this fund have been demonstrated in dozens of papers (including but not limited to Flis and Swianiewicz 2021a; 2021b; 2021c; Czepil 2022; Olejnik 2022; Matuszak et al. 2022; Olejnik and Grygo 2024; Gendźwiłł et al. 2024).

At the same time, the Law and Justice party (Polish: *Prawo i Sprawiedliwość*, hereinafter referred to as PiS) was in power at the central level and won 235 out of 460 seats in the lower house of parliament in the 2019 parliamentary elections, giving it a slim majority, to begin with. Although the party was usually presented as a single party, in practice it was a coalition of PiS with the much smaller and dependent parties of United Poland (Polish: *Solidarna Polska*) and Agreement (Polish: *Porozumienie*). All these parties ran for parliament under the name of PiS, formed a parliamentary club under the name of PiS, benefited from a party subsidy to PiS, appeared in local government under the name of PiS, and the name of PiS usually appeared in the Polish media, so they should be considered factions within one party rather than a coalition of different parties. During the 2019-2023 term, a series of party reshuffles took place within the ruling party: 9 MPs permanently left the ruling party, 8 MPs elected from opposition lists joined it, while 3 MPs first left PiS and later returned to it. The possibility of identifying at least two factions within the ruling party, combined with the highly discretionary nature of the local government grant programme, creates a unique institutional setting for examining the impact of factional rivalry on the distribution of funds.

In this article, several research hypotheses were tested using data on more than 13,000 discretionary grants to local governments, data on the places of birth and residence of 460 MPs of the lower house of the parliament, 100 senators, and 52 members of the European Parliament, and data on the electoral performance of the Law and Justice party at the municipal level in the 2005-2019 period. The results clearly indicate that there was an alignment bias in the studied sample, as municipalities governed by PiS mayors received significantly higher grants than municipalities governed by the opposition mayors. The results also indicate the existence of a hometown bias and a birth town bias, as municipalities that were the place of residence or birth of 'core' PiS MPs received significantly higher grants. Moreover, municipalities that were the birthplace or place of residence of politicians from the PiS factions (*United Poland and Agreement*) received significantly lower discretionary grants, much lower even than the birthplace or place of residence of opposition politicians. These results clearly indicate that hometowns or birth towns biases can exist, but that they are linked to membership of a particular faction within a party. This can be referred to as 'conditional hometown bias' or 'faction-

dependent hometown bias'. Estimating equations with more political variables also suggests that the hometown bias and alignment bias can occur jointly and are therefore not mutually exclusive.

The remaining portion of this paper is structured as follows: Section 2. provides a literature review on the theory of intergovernmental grants and the possible impact of political motives on the allocation of investment grants, and Section 3. presents the institutional background and a data description. The research methodology is described in Section 4, while the results are presented in Section 5. Section 6 concludes the paper.

2. Literature review

The normative theory of public finance (also known as the first-generation theory of fiscal federalism) posits that grants to local governments in a system of multi-tier government are designed to address the vertical fiscal imbalance between tiers of government and to ensure horizontal fiscal equity among jurisdictions (Musgrave 1959, Inman and Rubinfeld 1997). This perspective is based on the assumption that each level of government would seek to maximize the social welfare of its respective constituency. Consequently, local governments are expected to advance the interests of those within the confines of their limited jurisdiction. In a context where public goods are consumed at a level below that of the nation as a whole, decentralized finance presents a significant opportunity for enhancing social welfare. Additionally, this theory addresses the issue of equalizing grants from the central government to local governments. Such grants may be justified on both equity and efficiency grounds, as local officials possess superior knowledge of local needs and cost functions. Additionally, rule-based grants also prevent the central government from transferring an excessive amount of resources to specific regions (Oates 2005). Grants may be utilised to encourage expenditure in spillover-generating services, to diminish the reliance on suboptimal local taxes (Dahlby and Wilson 1994), or to ensure uniform access to essential public services across the nation (Buchanan 1950).

The second-generation theories of fiscal federalism posit that the distribution of grants to local governments is shaped by political interests rather than the pursuit of efficiency. In contrast with the preceding theories which largely assumed that public officials act in the public interest, these theories posit that both voters and officials have their own objective functions that they seek to maximize within the constraints of the political environment (Oates 2005). The policymakers are typically political parties or politicians, who may be opportunistic and implement policies designed to maximise their chances of re-election, or be partisan and to seek to further the interests of their own support groups (Arulampalam et al. 2009). The existence of political motivations in grant allocation may result in welfare losses, excessive government spending, and regional inequalities (Veiga and Veiga 2013).

Opportunistic politicians who seek re-election may pursue two distinct distributive strategies to secure the second term. The initial strategy may entail the transfer of financial resources to those who are pivotal in determining the outcome of an election, as they may be more amenable to switching their allegiance in response to economic incentives. Consequently, constituencies where a higher proportion of voters exhibit a lack of preference between parties may receive a higher allocation of funding from the central government (Lindbeck and Weibull 1987; Dixit and Londregan 1996). A second strategy for winning an

election may be the transfer of funds to core voters. Cox and McCubbins (1986) posit that political parties differ from each other due to varying efficiencies in diagnosing and satisfying voters' needs. They present a model suggesting that risk-averse politicians would rather support their core voters than swing voters. To date, numerous empirical studies have corroborated the core-voters hypothesis (Golden and Picci 2008; Kauder et al. 2016), whereas others have validated the swing-voters hypothesis (Dahlberg and Johansson 2002; Johansson 2003; Litschig 2012; Vaiga and Veiga 2013; Gonschorek et al. 2018).

Opportunistic politicians at the central government level tending to re-election may consider not only potential voters' preferences in a selected constituency but also partisan ties binding them with politicians ruling at the local tier of government. Transferring more grants to municipalities governed by mayors from the same party (aligned municipalities) signals higher competence of those mayors and thus increases the probability of their re-election (Bracco et al. 2015). Extra transfers may increase the vote share of incumbents in local elections (Migueis 2013), but it might be a two-way dependency and voters living in these municipalities may be more willing to vote for the same party in parliamentary election. To decrease the chances of opposition politicians, the central government may penalize municipalities run by mayors from the opposition coalition, thereby tying their hands for the next election (Brollo and Nannicini 2012). Dalle Nogare and Kauder (2017) argue that transfers may be an effect of lobbying of local politicians because they are higher when ruling mayors are eligible to be re-elected and they are not constrained by term limits. Many empirical works argue that alignment bias at some point was present in Chile (Corvalan et al. 2018), Germany (Baskaran and Hessami 2017; Quinckhardt 2023), Greece (Psycharis et al. 2020), Hungary (Muraközy and Telegdy 2016; Papp 2019; Vasvári and Longauer 2024; Vasvári 2024), India (Arulampalam et al. 2009), Italy (Bracco et al. 2015), Portugal (Migueis 2013), South Korea (Lee et al. 2024), Spain (Solé-Ollé and Sorribas-Navarro 2008; Curto-Grau et al. 2018) and in the US (Berry et al. 2010).

Another political motivation for the distribution of funds may be the desire to support one's birth town, place of residence, or constituency. This may be due to electoral motives and the desire to increase one's chances of re-election, as voters who receive more public goods may have stronger incentives to vote for a particular politician (see Golden and Picci 2008). However, Carozzi and Repetto (2016) show that in Italy, significantly higher subsidies were received by municipalities that were the birthplace of politicians running from other constituencies, so personal motives, such as improving their career prospects in local government after serving in parliament, may have played a large role. Another personal motive may be the desire to increase one's own utility, as the politician may benefit in his private life from better public goods produced by the state (e.g. his children may be closer to school, see Harjunen et al. 2023 and Folke et al. 2024). In developing countries, ethnic favouritism may play an important role (Hodler and Raschky 2014). The existence of hometown or birth town bias has been confirmed in many empirical papers analysing a huge panel of 126 countries (Hodler and Raschky 2014), all of Latin America (Cruzatti et al. 2024), Belgium (Jennes and Persyn 2015), Italy (Golden and Picci 2008; Carozzi and Repetto 2016), Norway (Fiva and Halse 2016), and German lands (Maaser and Stratmann 2016; Baskaran and Lopes da Fonseca 2021).

However, despite the existence of a large body of empirical work, there are still research gaps. All of the aforementioned work has tended to assume that members of the same party are

loyal to each other and work for the common success of winning elections. To some extent this is understandable, but in reality, members of the same party are not only involved in inter-party rivalry. They also compete with their fellow party members: for the nomination of a party's candidate in an election, for positions in government, for party leadership, for campaign funds, and so on. In proportional systems with multi-member constituencies, candidates from a given party also compete with each other for a seat in parliament. To the best of the authors' knowledge, no study has been published that analyses the influence of intra-party competition on the allocation of discretionary grants. This study aims to fill this research gap.

3. Institutional background and data

The 2021-2023 discretionary grant program for local governments in Poland, when considered alongside the characteristics of the ruling Law and Justice (PiS) party, provides an ideal setting for an investigation to examine the impact of intra-party rivalry on the distribution of funds to local governments.

In 2020, Poland established the COVID-19 Response Fund, which was administered by the state-owned National Development Bank (Polish: *Bank Gospodarstwa Krajowego*), while the disbursement of funds was overseen by Mateusz Morawiecki, the Prime Minister. This fund, which was established in April 2020 with the objective of financing extraordinary fiscal measures designed to protect households and businesses during the lockdowns caused by the COVID-19 pandemic, was almost entirely debt-financed. In the second half of 2020, it was decided to use this fund to finance investment grants to local governments, with the intention of stimulating the Polish economy in compliance with Keynesian principles.

The initial programme was the Government Local Investment Fund (Polish: *Rządowy Fundusz Inwestycji Lokalnych*). The initial tranche was based on established criteria and involved the transfer of a total of PLN 6 billion (approximately EUR 1.4 billion) to all Polish local governments. The distribution of funds based on an algorithm set by the government did not give rise to any controversy. In contrast, the second tranche, along with subsequent tranches for mountain municipalities and municipalities previously dominated by the state-owned agricultural holdings, were based on calls for proposals. The evaluation committee comprised ten members appointed by the Prime Minister and four ministers (all from the 'core' Law and Justice Party, rather than other factions). Applications were assessed against criteria that were so general that, in principle, any investment, if properly interpreted, could meet the requirements. A total of approximately PLN 7.2 billion was distributed under the second tranche of the programme. The Committee's decisions were met with significant controversy, as the grants distributed to local authorities led by mayors affiliated with the Law and Justice party were considerably larger than those allocated to local authorities under the leadership of opposition figures. The Polish audit body, the Supreme Audit Office (2023), evaluated the grant allocation process as "non-transparent" citing deficiencies in the assessment procedure, which did not guarantee openness and transparency, and the criteria used to evaluate applications, which were deemed to be too general. Among other things, it was pointed out that no uniform evaluation mechanism had been developed at the stage of examining applications, that the reasons for the decisions taken were not documented in any form, that no minutes were kept of the Commission's meetings, and that no provision was made for appealing to the Court against

decisions taken after the results had been announced. The National Audit Office also points out that in the case of many very similar investments, some were funded and others were not. Applications that did not meet the formal criteria of the competition or were submitted after the deadline were considered favourably. The Committee's deliberations were so short that the Committee had only a few seconds to consider the application. A number of research papers point to the presence of strong political favouritism and alignment bias (Rudka and Kocemba 2021; Flis and Swianiewicz 2021a; 2021b; Olejnik 2022; Czepil 2022; Matuszak et al. 2022; Olejnik and Grygo 2024; Gendźwiłł et al. 2024).

The investment grants provided by the Government Local Investment Fund were only the beginning of the transfers. The successor to this programme was the Governmental Polish Order Fund (Polish: *Rządowy Fundusz Polski Ład*), which was very similar to its predecessor. The main difference was the size of the funds, as this time up to PLN 99.2 billion (approx. EUR 23.6 billion) was distributed over nine calls for proposals between 2021 and 2023. Another change was the replacement of the nine evaluation criteria by two, with the committee assessing investments in terms of 'achievement of the COVID-19 counterpart objective' and 'comprehensiveness of the planned investments'. As in the case of the previous programme, the Supreme Audit Office found similar irregularities, e.g. the chairman of the committee single-handedly changing the recommendations after committee meetings, or a positive decision being given to an application without any justification (blank). Political favouritism and alignment bias in the case of this programme was demonstrated in the works of Flis and Swianiewicz (2021c) and Olejnik and Grygo (2024).

The final study examined in this article is the Government Monuments Reconstruction Programme (Polish: *Rządowy Program Odbudowy Zabytków*), which exhibited similarities to its predecessors in terms of its structure. In two calls made in 2023 approximately PLN 4.3 billion (approximately EUR 1.0 billion) was distributed. As Olejnik and Grygo (2024) have observed, approximately 63.1% of this amount was awarded to monuments managed by the Catholic Church.

The following article presents an analysis of the distribution of financial resources from the aforementioned three programmes. The total amount of allocated funds was PLN 110.7 billion (approximately EUR 26.3 billion), equating to approximately PLN 2917 per capita. A straightforward calculation of the averages demonstrates that municipalities under the governance of opposition parties received PLN 1465 per capita, while those under the governance of Law and Justice party mayors received PLN 3871 per capita, representing a 2.64 times greater allocation. Consequently, given the potential for political motives to influence the distribution of funds, a comprehensive examination of alignment bias and hometown bias is warranted.

At the time, Poland was under the governance of the Law and Justice (PiS) party, which had emerged victorious in the 2019 parliamentary elections, securing 235 out of 460 seats in the Polish lower house of parliament (*Sejm*)³. Thereafter, a government was formed under the leadership of Prime Minister Mateusz Morawiecki. In practice, the grouping is typically

³ Since 2002, Poland has operated a proportional representation electoral system, whereby the number of parliamentary seats is distributed by the D'Hondt method across 41 electoral districts, with 7 to 20 seats allocated to each. The distribution of seats between parties is based on the outcome of the respective electoral committee. The candidates with the highest results on their lists in a constituency are represented in parliament.

presented as a single party. However, in accordance with the formal designation, it was in fact a coalition of three parties. The coalition comprised the Law and Justice party, the United Poland party and the Agreement party. The United Poland party was established in 2011 by former members of the PiS who had formed a rival right-wing political party. In contrast, the Agreement party (formerly known as Poland Together) was established in 2013 by former conservative activists from Civic Platform, the Polish People's Party, Law and Justice, and other right-wing organisations. Both United Poland and Poland Together performed poorly in the 2014 MEP elections, leading them to form a coalition with PiS in 2015 under the name 'United Right'.

The Law and Justice party was the preeminent force within the coalition, a fact reflected in the coalition's name, which was used in all elections held in 2015 and 2019. Prior to the elections, the aforementioned parties collaborated to develop a unified electoral programme. Furthermore, the two smaller parties received funding from the party subvention allocated to PiS. At the local government level, all three parties typically operated under the designation "PiS." The government that was formed subsequently referred to itself as the Law and Justice government, and the parliamentary clubs in both houses of parliament were also designated as Law and Justice. Additionally, the names "United Right," "United Poland," and "Agreement" were observed to occur with minimal frequency in the media. When considering these observations alongside the fact that both parties were largely constituted by former Law and Justice activists, it can be posited that they may be more accurately conceptualized as factions within the larger Law and Justice coalition, rather than as three distinct and independent entities. Consequently, the term "factions" will be employed consistently throughout the remainder of this paper⁴.

In 2019, the PiS party introduced 235 members to the lower house of parliament (Polish: *Sejm*). Of these, 201 formally belonged to the PiS party (hereafter referred to as the 'core' PiS). The United Poland party gained 18 members, while the Agreement party gained 16 members. In the Senate, the 'core' PiS obtained 45 of the 100 seats, while United Poland and Agreement each obtained two. In the 2019 European Parliament elections, the 'core' PiS obtained 25 of the 52 seats allocated to Poland, while United Poland secured a further two. A total of 612 politicians were thus included in the survey, of whom 311 were members of PiS (of whom 40 belonged to the PiS factions). It was decided to also include senators and MEPs, given that they too can exert influence within the party and lobby for transfers of funds to their constituencies, hometowns or birth towns. The results presented in the Appendix include only those including the lower house MPs.

At the turn of 2020, an intra-party crisis emerged within the PiS party. This was caused, among other factors, by a disagreement between Jarosław Gowin's faction and the party's decision-making body. In conclusion, the internal conflicts within the party between 2020 and 2022 resulted in 12 MPs (including 7 MPs from the Agreement) permanently leaving the PiS parliamentary club. In response to the loss of its parliamentary majority, PiS initiated measures to re-engage with former members and commenced the process of recruiting opposition MPs. Ultimately, between 2021 and 2022, PiS was able to retain its parliamentary majority as a result

⁴ Classifying these parties as a coalition would not alter the findings of the study; it would merely necessitate a substitution of "intra-party competitions between factions" with "inter-party competition between parties in the coalition."

of persuading three MPs who had previously left the party to return, in addition to gaining 8 MPs from the opposition (two elected from the New Left and six from the Polish People's Party).

The objective of this paper is to analyse the influence of each faction's membership on the financial resources allocated to local governments that are their hometowns or birth towns. The dependent variable is thus defined as the total investment grants received by each local government from the three programmes funded by the Covid-19 Response Fund, as previously described. The funds were intended to provide support for the sustainable development of all regions in Poland, with a particular focus on those that were less developed. Accordingly, a number of control variables were included in each equation to control for the variance resulting from municipal diversity. The initial control variable is the population of the municipality. Subsequent control variables include Personal Income Tax (PIT) and Corporate Income Tax (CIT) per capita income, which were included to capture the wealth of the municipality. In order to control for the specific circumstances of agricultural and mountain municipalities, which received some of the funds directly, variables describing per capita agricultural tax revenue and the level of afforestation of the municipality were included. Furthermore, a variable reflecting the fiscal capacity of the municipality was included in the analysis: debt in relation to municipal revenues (average for 2019-2021).

Meanwhile, in some equations, the explanatory variables (independent variables) are the PiS result in the 2019 elections (to test the core voters hypothesis), the standard deviation of the PiS results in the parliamentary elections of 2005-2019 (to test the swing voters hypothesis), and the party affiliations of the mayors (to test the alignment bias). The mayors were divided into three categories: those affiliated or supported by the Law and Justice party (according to reports by the State Electoral Committee), those affiliated or supported by parliamentary opposition parties and independents (non-partisan). The latter category serves as the reference point.

Further explanatory variables, which may be considered independent variables, describe the fact of being a hometown or birth town of members of the PiS party or members of the opposition. Two variables were incorporated into some equations: one encompassing the entirety of the 'core' PiS, loyalist MPs from the factions and new MPs from the opposition; and the other encompassing the entirety of the opposition, including MPs who left PiS parliamentary club. The remaining variables included five categories: one for the 'core' members of the PiS party, another for the loyal MPs from the PiS factions, a third for the new MPs in PiS party who had previously been in the opposition (i.e., switchers to PiS), a fourth for those who had left PiS party (i.e., switchers to the opposition), and a fifth for the MPs from the opposition. Therefore, the initial set of variables delineates the two factions within the Polish parliament (those in power and the opposition) at the outset of 2022 (i.e., when the local government support programs commenced). In contrast, the subsequent set presents a more intricate and multifaceted reality. The use of five variables allows for the identification of effects that would otherwise be obscured by the use of only two variables. Firstly, the value of grants for the 'core' PiS and PiS factions may differ, as the distribution of funds was controlled by the 'core' PiS faction. Secondly, this allows for an evaluation of whether local governments that are hometowns or birth towns of new party switchers who have joined PiS party are significantly

rewarded or whether the places of origin of party switchers who have left PiS are significantly penalised for their disloyalty.

In evaluating the phenomenon of "hometown bias," it can be challenging to ascertain the precise location of a politician's actual hometown. It is therefore possible that a politician may have been born in one place, subsequently relocated, and then stood as a candidate from a constituency that is not their place of residence. For this reason, in some instances, the official place of residence of a given MP at the time of the registration of electoral lists is defined as the hometown. In Poland, it is a legal requirement for every citizen to officially register at one address. In some instances, the place of birth of politicians is taken into account instead of their place of residence. Data on the place of birth of each MP is available on the website of the Polish parliament. For these two sets of variables, the value represents the number of politicians who lived in the selected municipality (or were born in). If there was one politician, the variable took the value of 1; if there were three politicians, the value was 3, and so on.

It is possible that politicians who occupy more advantageous positions within their respective parties may be more effective in cultivating support in their home constituencies. Consequently, a transformed value for residences was employed in certain equations. In this instance, a value was calculated for each politician, which was inversely proportional to their position on the list. In Poland, the position on the electoral list is typically indicative of the position within the political party, as voters tend to cast their ballots for the candidate at the top of the list. In the case of a politician occupying the second position on the electoral list, the variable was assigned a value of 0.5 for the municipality in which they resided. Similarly, for those situated in the fifth position, the value was set at 0.2, and so forth. In instances where a politician was running from a distant position on the list, the expert assumed a value of 0.5, as it is not uncommon for well-known politicians in Poland to be situated in these positions.

Descriptive statistics of all variables used in this study are presented in Table 1.

Table 1. Descriptive statistics

Variable	Source	Min.	Mean	Median	Max.	Std. Dev.
Population (thousands)	SP	1.2	15.3	7.3	1 862.0	52.1
Personal Income Tax per capita (PLN)	SP	132	1 220	1 154	4 504	363
Corporate Income Tax per capita (PLN)	SP	0	41	17	2 249	82
Agricultural tax per capita (PLN)	SP	0	100	74	704	97
Debt to revenues (%)	MoF	0.00	0.19	0.17	0.96	0.14
Afforestation (%)	SP	0.00	0.06	0.04	0.45	0.07
PiS result in 2019 parliamentary election (%)	NEC	18.3	53.6	53.3	88.9	13.9
Standard deviation of PiS results (2005-2019)	Own calc.	0.7	11.1	10.6	28.5	5.0
Mayor from PiS	Own calc.	0.0	0.1	0.0	1.0	0.3
Mayor from Opposition	Own calc.	0.0	0.2	0.0	1.0	0.4
Hometown of PiS MPs (core)	Own calc.	0.0	0.1	0.0	22.0	0.6
Hometown of PiS MPs (factions)	Own calc.	0.0	0.0	0.0	6.0	0.2
Hometown of PiS MPs (switchers) ¹	Own calc.	0.0	0.0	0.0	1.0	0.1
Hometown of opposition MPs (switchers) ²	Own calc.	0.0	0.0	0.0	2.0	0.1
Hometown of opposition MPs (core)	Own calc.	0.0	0.1	0.0	40.0	1.0
Birth town of PiS MPs (core)	Own calc.	0.0	0.1	0.0	19.0	0.6
Birth town of PiS MPs (factions)	Own calc.	0.0	0.0	0.0	6.0	0.2
Birth town of PiS MPs (switchers) ¹	Own calc.	0.0	0.0	0.0	1.0	0.1
Birth town of opposition MPs (switchers) ²	Own calc.	0.0	0.0	0.0	1.0	0.1
Birth town of opposition MPs (core)	Own calc.	0.0	0.4	0.0	103.0	2.7
Hometown of PiS MPs (core) - inv. function	Own calc.	0.0	0.1	0.0	16.4	0.4

Hometown of PiS MPs (factions) - inv. function	Own calc.	0.0	0.0	0.0	3.3	0.1
Hometown of PiS MPs (switchers) ¹ - inv. function	Own calc.	0.0	0.0	0.0	1.5	0.0
Hometown of opposition MPs (switchers) ² - inv. function	Own calc.	0.0	0.0	0.0	1.0	0.1
Hometown of opposition MPs (core) - inv. function	Own calc.	0.0	0.1	0.0	32.0	0.8
Total grants per capita (PLN)	BGK	149.5	4 603.0	3 914.0	41578.0	3 343.0

¹ MPs who left opposition and started supporting PiS government; ² MPs who left PiS parliamentary club

Note: SP means Statistics Poland, MoF means Ministry of Finance, NEC means National Electoral Commission; PiS means Law and Justice party

4. Research methodology

In order to demonstrate the impact of a Member's place of residence or place of birth on the size of investment grants awarded, it is first necessary to properly capture the diversity of Polish municipalities. A potential issue arises from the possibility of endogeneity, whereby the characteristics of a given municipality, such as location or other socio-economic factors, may be correlated to the dependent variable. One of the objectives of the grant programmes administered by the Covid-19 Response Fund was to provide support to smaller and less affluent municipalities situated in locations remote from major urban centres. The maximum amount of grants that municipalities could receive under the Government Polish Order Fund programme was set at between PLN 1-65 million, depending on the programme. Consequently, larger cities received smaller per capita grants than smaller municipalities. If the committees responsible for awarding the grants had taken into account the socio-economic characteristics of the municipalities in question, then the size of the grant would have been dependent on these characteristics. Furthermore, a greater proportion of Law and Justice MPs hailed from less affluent regions of Poland. Consequently, there may be a problem arising from a potential endogeneity resulting from mutual correlations and relationships between grants value and the socio-economic characteristics of municipalities, as well as political variables.

In light of the potential correlation between the independent variables and the error term, the application of the Ordinary Least Squares Method may lead to estimator inconsistency and yield biased results. It is therefore recommended that an econometric method which most accurately models inter-municipal variation be applied. The selected method is multilevel mixed-effects linear regression (MML), which performs relatively well in situations where the dependent variable is only partly observed. In this case, the socio-economic and political characteristics of the municipality cannot be fully captured by the selected control variables. Therefore, the introduction of random effects due to clustering in the data may provide consistent and more efficient estimates. The municipalities of Poland are incorporated into counties, which are in turn included in constituencies. Each county encompasses municipalities with similar characteristics, while in each constituency, voters cast their ballots for distinct lists of candidates. This three-level clustering of data (municipalities grouped into counties, which are grouped into constituencies) may facilitate the capture of unobserved socioeconomic and political effects.

Linear mixed models comprise both fixed and random effects. They represent a generalisation of linear regression, facilitating the incorporation of random effects other than those associated with the overall error term (for further details, see Bryk and Raudenbousch 2002 and McCulloch and Searle 2008). In the case of clustered data, the mixed models are

organised as independent groups (clusters). The final regression equation for a multilevel model is as follows:

$$y_j = X_j\beta + Z_ju_j + \epsilon_j \quad (1)$$

where y_j represents the dependent variable within cluster j . $X_j\beta$ is comparable to the linear estimates derived from a standard OLS, while Z_j represents a design matrix for the j -th random effects u_j . The random effects are estimated at the higher levels in equations, including constants, group-specific random residuals with normal distributions and optional explanatory variables. This paper will focus on the higher-level equations grouping counties and constituencies, which include only constants and random residuals.

In order to present the results of the study in an accurate and comprehensive manner, this article presents the estimation results of fourteen equations. The initial equation comprises solely control variables. The following three equations are employed to evaluate the proposition that investment grants are allocated to municipalities where PiS achieved considerable electoral success (i.e. to core voters) or to municipalities where electoral outcomes exhibited pronounced fluctuations over time (i.e. to swing voters). Equation five tests the hypothesis of the existence of alignment bias in the distribution of investment grants. The following nine equations test the hypotheses of the existence of hometown bias or birth town bias. Three equations contain two aggregate explanatory variables (without factional and switcher distribution). Three further equations contain five variables disaggregated into factions and switchers.

The remaining three include seven variables, five including the hometowns or birth towns of the MPs and two including the party affiliation of the mayor. The results testing the hometown bias are presented first, followed by the birth town bias and then the hometown bias corrected by the inverse function of the politician's position in the party. Table 2 presents the results of a three-level model estimation based on a sample of 2476 Polish municipalities. Table 3 presents the results of two-level model estimation based on 380 counties.⁵ Table 4 in the appendix presents the results of model estimation for municipalities using OLS. In turn, Tables 5. and 6. in the Appendix present the estimation results only for deputies of the lower house of parliament, the samples do not include deputies of the upper house of parliament (senators) and Members of the European Parliament.

⁵ These figures cannot be considered as mere aggregates or averages of the figures pertaining to the municipalities. In the case of PIT and CIT revenues per capita, the figures represent the sum of the revenues of all municipalities from the district, plus the revenue of the district itself from participation in these taxes, divided by the population of the district. In the case of total grants per capita, the figures include the sum of the grants to the municipalities, plus the grants to the county itself. The variables 'mayors from PiS' and 'mayors from opposition' represent the percentage of municipalities in the county governed by mayors from these parties.

Table 2. Estimation results (municipalities)

	Dependent variable: log of Total grants per capita													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Municipality-level variables														
Log of population	-0.679*** (0.0147)	-0.648*** (0.0150)	-0.645*** (0.0153)	-0.641*** (0.0153)	-0.677*** (0.0144)	-0.716*** (0.0162)	-0.727*** (0.0163)	-0.700*** (0.0165)	-0.718*** (0.0164)	-0.726*** (0.0165)	-0.698*** (0.0167)	-0.706*** (0.0160)	-0.716*** (0.0161)	-0.687*** (0.0163)
Log of PIT per capita	0.250*** (0.0367)	0.346*** (0.0383)	0.313*** (0.0374)	0.350*** (0.0382)	0.265*** (0.0359)	0.186*** (0.0387)	0.166*** (0.0388)	0.256*** (0.0401)	0.180*** (0.0390)	0.164*** (0.0391)	0.255*** (0.0402)	0.198*** (0.0386)	0.181*** (0.0387)	0.273*** (0.0399)
Log of CIT per capita	-0.0127* (0.00655)	-0.00240 (0.00662)	-0.00277 (0.00667)	-0.000467 (0.00666)	-0.0118* (0.00637)	-0.00940 (0.00654)	-0.00842 (0.00653)	-0.000647 (0.00643)	-0.00873 (0.00656)	-0.00781 (0.00655)	0.000419 (0.00644)	-0.00989 (0.00656)	-0.00884 (0.00655)	-0.000594 (0.00645)
Log of agr. tax per capita	0.0134* (0.00744)	0.00434 (0.00745)	0.00120 (0.00758)	0.00105 (0.00756)	0.0128* (0.00726)	0.0115 (0.00745)	0.0111 (0.00742)	0.00419 (0.00727)	0.0102 (0.00746)	0.00997 (0.00743)	0.00286 (0.00727)	0.0106 (0.00746)	0.0106 (0.00744)	0.00340 (0.00728)
Debt to revenues	0.304*** (0.0608)	0.324*** (0.0601)	0.317*** (0.0602)	0.325*** (0.0600)	0.305*** (0.0592)	0.303*** (0.0603)	0.294*** (0.0601)	0.311*** (0.0582)	0.296*** (0.0605)	0.293*** (0.0603)	0.310*** (0.0584)	0.302*** (0.0606)	0.294*** (0.0605)	0.312*** (0.0586)
Afforestation	0.231 (0.164)	-0.110 (0.168)	0.0778 (0.163)	-0.0910 (0.167)	0.158 (0.160)	0.200 (0.164)	0.189 (0.163)	-0.119 (0.163)	0.171 (0.164)	0.161 (0.163)	-0.159 (0.164)	0.182 (0.164)	0.175 (0.163)	-0.147 (0.164)
PiS result (2019)		0.00880*** (0.00114)		0.00643*** (0.00148)				0.00630*** (0.00113)			0.00663*** (0.00113)			0.00669*** (0.00113)
Std. Dev. of PiS results (2005-2019)			0.0189*** (0.00274)	0.00889** (0.00357)										
Mayor from PiS					0.201*** (0.0257)			0.187*** (0.0253)			0.186*** (0.0254)			0.184*** (0.0255)
Mayor from opposition					-0.136*** (0.0193)			-0.134*** (0.0190)			-0.136*** (0.0191)			-0.134*** (0.0191)
Hometown of PiS MPs (core + factions + switchers)						0.0846*** (0.0196)								
Hometown of opposition MPs (switchers + core)														
Hometown of PiS MPs (core)							0.141*** (0.0225)	0.129*** (0.0219)						
Hometown of PiS MPs (factions)							-0.194*** (0.0658)	-0.173*** (0.0638)						
Hometown of PiS MPs (switchers)							-0.0583 (0.117)	-0.0486 (0.114)						
Hometown of opposition MPs (switchers)							0.150 (0.100)	0.0913 (0.0972)						
Hometown of opposition MPs (core)							-0.000962 (0.0144)	0.000847 (0.0139)						
Birthtown of PiS MPs (core + factions + switchers)									0.0386* (0.0211)					
Birthtown of opposition MPs (switchers + core)									0.0104* (0.00557)					
Birthtown of PiS MPs (core)									0.0770*** (0.0230)	0.0737*** (0.0223)				
Birthtown of PiS MPs (factions)									-0.195*** (0.0656)	-0.177*** (0.0635)				
Birthtown of PiS MPs (switchers)									-0.201* (0.122)	-0.209* (0.118)				
Birthtown of opposition MPs (switchers)									0.171 (0.119)	0.152 (0.116)				
Birthtown of opposition MPs (core)									0.0137*** (0.00572)	0.0128** (0.00555)				
Hometown of PiS MPs (core + factions + switchers) - inv. function												0.0568* (0.0312)		
Hometown of opposition MPs (switchers + core) - inv. function												0.0209 (0.0192)		
Hometown of PiS MPs (core) - inv. function													0.120*** (0.0353)	0.102*** (0.0343)
Hometown of PiS MPs (factions) - inv. function													-0.421*** (0.133)	-0.362*** (0.128)
Hometown of PiS MPs (switchers) - inv. function													0.283 (0.198)	0.201 (0.192)
Hometown of opposition MPs (switchers) - inv. function													0.0338 (0.150)	0.0776 (0.145)
Hometown of opposition MPs (core) - inv. function													0.0291 (0.0199)	0.0303 (0.0193)
Constant	12.50*** (0.349)	11.10*** (0.388)	11.56*** (0.370)	11.03*** (0.388)	12.39*** (0.342)	13.28*** (0.380)	13.51*** (0.382)	12.33*** (0.419)	13.34*** (0.384)	13.52*** (0.386)	12.30*** (0.422)	13.11*** (0.377)	13.31*** (0.379)	12.08*** (0.416)
County-level variances														
Constant	0.0220 (0.0043)	0.0197 (0.0039)	0.0191 (0.0039)	0.0190 (0.0038)	0.0239 (0.0044)	0.0214 (0.0043)	0.0202 (0.0041)	0.0208 (0.0039)	0.0214 (0.0042)	0.0208 (0.0041)	0.0213 (0.004)	0.0217 (0.0043)	0.0209 (0.0042)	0.0212 (0.004)
Constituency-level variances														
Constant	0.0216 (0.0063)	0.0211 (0.0061)	0.0209 (0.006)	0.0211 (0.0061)	0.0212 (0.0063)	0.0228 (0.0072)	0.0214 (0.0066)	0.0213 (0.0066)	0.0223 (0.0069)	0.0209 (0.0064)	0.0203 (0.0062)	0.0224 (0.0069)	0.0215 (0.0065)	0.0212 (0.0064)
Number of observations	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476
LR test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3. Estimation results (counties)

	Dependent variable: log of Total grants per capita													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
County-level variables														
Log of population	-0.321*** (0.0419)	-0.336*** (0.0404)	-0.300*** (0.0413)	-0.333*** (0.0419)	-0.312*** (0.0397)	-0.268*** (0.0468)	-0.278*** (0.0473)	-0.286*** (0.0440)	-0.258*** (0.0465)	-0.259*** (0.0466)	-0.270*** (0.0435)	-0.262*** (0.0461)	-0.267*** (0.0463)	-0.278*** (0.0430)
Log of PIT per capita	0.0418 (0.146)	0.287** (0.146)	0.169 (0.144)	0.285* (0.146)	0.0521 (0.140)	0.231 (0.149)	0.223 (0.150)	0.341** (0.148)	0.206 (0.147)	0.207 (0.148)	0.327** (0.147)	0.209 (0.151)	0.212 (0.151)	0.352** (0.149)
Log of CIT per capita	-0.174*** (0.0398)	-0.130*** (0.0393)	-0.131*** (0.0404)	-0.127*** (0.0399)	-0.154*** (0.0379)	-0.178*** (0.0390)	-0.169*** (0.0395)	-0.123*** (0.0377)	-0.180*** (0.0389)	-0.177*** (0.0390)	-0.130*** (0.0375)	-0.180*** (0.0392)	-0.175*** (0.0395)	-0.129*** (0.0376)
Log of agr. tax per capita	0.207*** (0.0179)	0.197*** (0.0171)	0.184*** (0.0178)	0.195*** (0.0179)	0.206*** (0.0169)	0.204*** (0.0175)	0.202*** (0.0178)	0.196*** (0.0167)	0.198*** (0.0175)	0.198*** (0.0176)	0.196*** (0.0165)	0.204*** (0.0176)	0.200*** (0.0180)	0.192*** (0.0168)
Debt to revenues	-0.483** (0.202)	-0.280 (0.199)	-0.342* (0.201)	-0.277 (0.199)	-0.289 (0.192)	-0.386* (0.200)	-0.419** (0.201)	-0.127 (0.191)	-0.361* (0.200)	-0.338* (0.201)	-0.0612 (0.192)	-0.427** (0.201)	-0.420** (0.203)	-0.130 (0.192)
Afforestation	0.651*** (0.168)	0.770*** (0.161)	0.735*** (0.163)	0.773*** (0.162)	0.541*** (0.159)	0.683*** (0.165)	0.683*** (0.165)	0.644*** (0.156)	0.661*** (0.163)	0.665*** (0.163)	0.634*** (0.156)	0.658*** (0.167)	0.650*** (0.167)	0.629*** (0.157)
PiS result (2019)		0.0128*** (0.00239)		0.0119*** (0.00359)				0.00945*** (0.00263)			0.00939*** (0.00267)			0.0103*** (0.00261)
Std. Dev. of PiS results (2005-2019)			0.0348*** (0.00838)	0.00416 (0.0124)										
Mayor from PiS					0.418*** (0.151)			0.197 (0.159)			0.225 (0.159)			0.191 (0.160)
Mayor from opposition					-0.514*** (0.0827)			-0.478*** (0.0826)			-0.458*** (0.0827)			-0.453*** (0.0827)
Hometown of PiS MPs (core + factions + switchers)						0.0452** (0.0212)								
Hometown of opposition MPs (switchers + core)						-0.0615*** (0.0153)								
Hometown of PiS MPs (core)							0.0517** (0.0249)	0.0403* (0.0238)						
Hometown of PiS MPs (factions)							0.0587 (0.0720)	0.0261 (0.0668)						
Hometown of PiS MPs (switchers)							-0.156 (0.125)	-0.144 (0.116)						
Hometown of opposition MPs (switchers)							0.0225 (0.104)	-0.0998 (0.0977)						
Hometown of opposition MPs (core)							-0.0664*** (0.0160)	-0.0481*** (0.0151)						
Birthtown of PiS MPs (core + factions + switchers)									0.0487** (0.0218)					
Birthtown of opposition MPs (switchers + core)									-0.0250*** (0.00600)					
Birthtown of PiS MPs (core)										0.0495** (0.0241)	0.0293 (0.0230)			
Birthtown of PiS MPs (factions)										0.0721 (0.0706)	0.0312 (0.0659)			
Birthtown of PiS MPs (switchers)										-0.119 (0.133)	-0.124 (0.123)			
Birthtown of opposition MPs (switchers)										0.00331 (0.129)	-0.109 (0.121)			
Birthtown of opposition MPs (core)										-0.0258*** (0.00623)	-0.0161*** (0.00599)			
Hometown of PiS MPs (core + factions + switchers) - inv. function												0.0286 (0.0339)		
Hometown of opposition MPs (switchers + core) - inv. function												-0.0601*** (0.0213)		
Hometown of PiS MPs (core) - inv. function													0.0120 (0.0392)	0.00131 (0.0369)
Hometown of PiS MPs (factions) - inv. function													0.225 (0.145)	0.178 (0.135)
Hometown of PiS MPs (switchers) - inv. function													-0.178 (0.159)	-0.144 (0.148)
Hometown of opposition MPs (switchers) - inv. function													0.0302 (0.204)	-0.158 (0.191)
Hometown of opposition MPs (core) - inv. function													-0.0696*** (0.0220)	-0.0492** (0.0206)
Constant	11.28*** (1.121)	8.824*** (1.167)	9.673*** (1.157)	8.797*** (1.171)	11.08*** (1.075)	9.306*** (1.220)	9.453*** (1.228)	8.096*** (1.255)	9.414*** (1.208)	9.397*** (1.212)	8.040*** (1.248)	9.436*** (1.223)	9.468*** (1.226)	7.921*** (1.248)
Constituency-level variances														
Constant	0.0127 (0.0072)	0.0066 (0.0057)	0.0071 (0.0058)	0.0066 (0.0057)	0.0136 (0.0069)	0.0093 (0.0063)	0.0092 (0.0063)	0.0095 (0.0059)	0.0092 (0.0062)	0.0090 (0.0062)	0.0097 (0.006)	0.0106 (0.0066)	0.0107 (0.0067)	0.0097 (0.006)
Number of observations	380	380	380	380	380	380	380	380	380	380	380	380	380	380
LR test (p-value)	0.0065	0.0744	0.0617	0.0734	0.0019	0.0256	0.0264	0.0141	0.025	0.0284	0.0131	0.0157	0.0144	0.013

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5. Results

The results of the estimation demonstrate that the control variables are statistically significant and effectively capture the variation in the sample. Highly-populated municipalities and counties received significantly lower grants per capita, most likely due to the aforementioned limits on grant value. In the case of municipalities, personal income tax (PIT) revenues were found to be statistically significant, whereas in the case of counties, corporate income tax (CIT) revenues were significant (given that the revenue bases of municipalities and counties are primarily based on PIT and CIT shares, respectively).

The results of the estimation process clearly indicate the presence of alignment bias. The analysis revealed a significant disparity in grants allocations between municipalities governed by mayors from PiS and those governed by independent local authorities. In particular, the former received considerably higher grants, while the latter received significantly lower grants. The results are statistically significant for all equations. These findings align with those reported in the papers by Flis and Swianiewicz (2021a and 2021b), Olejnik (2022), Matuszak et al. (2022), and Olejnik and Grygo (2024).

An analysis of results for the aggregated variables describing the number of MPs who lived in a municipality indicates that hometown bias occurred. The results demonstrate that municipalities with MPs from PiS (including factions and switchers) received significantly higher grants than those without any politicians. Furthermore, the estimated parameter for the inverse function of politicians' position on the electoral list is also significant for PiS politicians, indicating that the better the position in the party, the greater the value of the grants received by the politician's municipality. In contrast, for hometowns of MPs from opposition parties, this effect is statistically insignificant and close to zero.

Similarly, in the case of birth towns, this effect is also present. Municipalities where PiS politicians were born received larger grants than municipalities where no politician was born. However, the value of the parameter is lower than for hometowns. The significance and signs of the parameters at the variable describing the opposition MPs' birthplaces differ between municipalities and counties, making it challenging to draw clear conclusions. It can thus be concluded that a bias in the distribution of the Covid-19 Response Fund towards municipalities where politicians were born was present, although it was not as pronounced as the bias towards their hometowns. The estimation based on a sample restricted to members of the lower house only, as presented in Appendix Tables 5 and 6, demonstrates that the variables tested remain significant and that the parameter values do not differ significantly.

The distribution of grants among MPs from the ruling party, divided into two factions (the 'core' PiS and the other factions, including United Poland and MPs from Agreement who did not leave PiS), and taking party switchers into account, yielded intriguing results. It is evident that the estimated parameters of the equations exhibit a notable degree of statistical significance, with opposing signs. With regard to hometowns, the figures are approximately 0.13-0.14 for the 'core' PiS and between -0.17 and -0.19 for the other factions within PiS. Similarly, in the case of birth towns, these differences are also present (approximately 0.07 for the 'core' PiS and between -0.17 and -0.19 for the factions) and are statistically significant. When the position of politicians within the party is taken into account, it becomes evident that these opposing signs are even more pronounced (approximately 0.12 for the 'core' PiS and

between -0.36 and -0.42 for the factions). Following the transformation of logarithms into levels, it can be calculated that a municipality with a PiS politician as its hometown received, on average, 443.4 PLN per capita more than a municipality where no politician lived. Conversely, a municipality in which a United Poland politician or a loyal Agreement politician lived, received approximately 480.5 PLN per capita less than a politically neutral municipality.

The aggregated variables from the preceding equations (considering the 'core' PiS, factions, and switchers collectively) exhibit parameters with values similar to the weighted averages of the three variables after disaggregation. The variables including PiS factions are only significant for the estimation based on municipalities rather than counties, which suggests that it was the specific municipalities from which specific United Poland and Agreement politicians, especially those with strong positions, were targeted. It should be noted that the hometowns and birthplaces of politicians from the PiS factions received significantly lower grants than those of opposition politicians. In the case of the opposition, these variables are either insignificant or significant and close to zero. It is only when the estimation is based on the aggregated data for 380 counties that it becomes apparent that these variables are significantly negative. In the vast majority of equations, the variables for party switchers are statistically insignificant, regardless of whether someone joined or left PiS party.

The analysis of the results leads to the conclusion that political motives affected the distribution of grants to local authorities. One such motive was to support municipalities from which PiS politicians originated, but only those who belonged to the same faction that staffed the grant awarding committee. The results substantiate the research hypothesis that an additional political motive may have been a desire to reduce transfers to municipalities from which politicians from another faction of the same party originated. The most probable explanation for this phenomenon is intra-party rivalry. Those belonging to the dominant faction sought to diminish the likelihood of their competitors in the forthcoming elections by "penalising" municipalities where they might have amassed a considerable number of voters. In this manner, they were able to signal high competence to their competence in future elections, thereby persuading them that being elected to parliament would positively impact the municipality's development. In contrast, politicians from other factions were less likely to have an electoral outcome that would allow them to enter parliament, as they did not demonstrate the requisite competence in grant acquisition for their municipalities. Notably, the parameter values indicate that intra-party rivalry played a more significant role in the distribution of funds than inter-party rivalry with the opposition.

This explanation is also consistent with the findings of political science research, as numerous journalists and political scientists have identified the competitive relationship between Prime Minister Mateusz Morawiecki of the 'core' Law and Justice party and Zbigniew Ziobro of United Poland as a key factor in the potential leadership succession within the party following the eventual departure of Jarosław Kaczyński as president of the party. Morawiecki was responsible for filling the largest number of seats in the committees responsible for awarding investment grants to local authorities. Consequently, the committee members he appointed were able to award smaller grants to municipalities from which his rival's supporters originated. If they were not elected in future parliamentary elections, Ziobro would have a reduced number of supporters, which would increase Morawiecki's chances of assuming a leadership position.

6. Conclusions

In a perfect world, the distribution of funds to local governments would be based on objective criteria, to enhance the efficiency of public goods provision by the state and reduce interregional inequalities. However, they can also be employed by politicians as tools for advancing their political agendas. To date, hundreds of papers have been published confirming the influence of political factors on the size of intergovernmental transfers. While dozens of papers discuss the core vs. swing voters hypothesis and hundreds more confirm the existence of, for example, alignment bias or hometown bias in different countries, it is rare to find a study analysing the impact of all these political motives simultaneously. Furthermore, it is generally assumed that members of one party support each other to the same extent.

This study addresses the aforementioned assumption. While it is true that members of a single party may support each other and that inter-party competition affects intergovernmental grants to some extent, this is a simplification. It is also the case that members of a party may compete with each other (for example, for leadership within the party or for positions within government). Furthermore, this competition intensifies in proportional representation systems when they also compete with each other for a position on the party list during further parliamentary elections.

This paper presents an analysis of the distribution of investment grants to Polish local governments between 2021 and 2023, with funding sourced from the Covid-19 Response Fund. The distinctive institutional context (high discretion in grant allocation and the ease of distinguishing factions within the ruling party) enabled an investigation into the impact of inter-party and intra-party competition on grant distribution. The results substantiate the existence of two discernible biases: alignment bias, whereby aligned municipalities received significantly higher grants, and hometown and birth town bias, whereby municipalities that are the place of birth or residence of ruling party politicians received more funds. After disaggregating Members of Parliament into factions, it becomes evident that municipalities with MPs from the dominant faction of the ruling party received significantly higher grants. The municipalities of origin of MPs from other factions received significantly lower grants, lower even than municipalities where opposition politicians lived. These results indicate that intra-party rivalry may influence the distribution of grants as strongly (or perhaps even more strongly) than inter-party rivalry for winning elections. For party switchers who left or joined the ruling party, no significant effects of 'rewarding' or 'punishing' their municipalities with higher or lower grants were observed.

It should be noted that this study has its limitations. The division of the PiS group into two distinct factions, one comprising the party's core members and the other consisting of politicians from United Poland and loyalist MPs from the Agreement, is a simplistic categorisation that can be open to debate. For instance, the internal division of the 'core' PiS into two distinct groups, namely the Prime Minister Mateusz Morawiecki faction and the 'PC Order', which is composed of Jarosław Kaczyński's former associates from the 1990s, is a topic frequently discussed in the media. The inclusion of MPs from both the lower and upper houses of parliament, as well as members of the European Parliament, in the study is also open to debate. However, the robustness checks included in the Appendix demonstrate that these effects are largely similar. Additionally, the definition of 'hometown' may also be open to

interpretation, as a given politician may be associated with multiple cities. Nevertheless, the research on the impact of intra-party rivalry on policy outcomes, although methodologically challenging, appears to hold promise.

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Appendix

Table 4. Estimation results (Ordinary Least Squares)

	Dependent variable: log of Total grants per capita													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Log of population	-0.704*** (0.0149)	-0.691*** (0.0148)	-0.679*** (0.0152)	-0.684*** (0.0152)	-0.704*** (0.0146)	-0.747*** (0.0161)	-0.760*** (0.0162)	-0.749*** (0.0159)	-0.749*** (0.0163)	-0.760*** (0.0164)	-0.749*** (0.0161)	-0.736*** (0.0160)	-0.747*** (0.0161)	-0.736*** (0.0158)
Log of PIT per capita	0.158** (0.0341)	0.239*** (0.0353)	0.210*** (0.0346)	0.240*** (0.0352)	0.180*** (0.0335)	0.0991*** (0.0355)	0.0790** (0.0355)	0.153*** (0.0362)	0.0907** (0.0356)	0.0740** (0.0357)	0.151*** (0.0362)	0.108*** (0.0355)	0.0896** (0.0355)	0.168*** (0.0361)
Log of CIT per capita	-0.0193*** (0.00692)	-0.00542 (0.00706)	-0.00771 (0.00706)	-0.00408 (0.00709)	-0.0178*** (0.00679)	-0.0144** (0.00690)	-0.0125* (0.00686)	-0.00201 (0.00688)	-0.0139** (0.00692)	-0.0124* (0.00690)	-0.000859 (0.00690)	-0.0154** (0.00693)	-0.0137** (0.00690)	-0.00227 (0.00692)
Log of agr. tax per capita	-0.000285 (0.00735)	-0.00835 (0.00733)	-0.0137* (0.00754)	-0.0119 (0.00752)	-0.000369 (0.00721)	-0.00299 (0.00733)	-0.00350 (0.00729)	-0.00922 (0.00717)	-0.00434 (0.00734)	-0.00452 (0.00730)	-0.0106 (0.00717)	-0.00374 (0.00735)	-0.00402 (0.00732)	-0.00999 (0.00719)
Debt to revenues	0.361*** (0.0627)	0.385*** (0.0620)	0.377*** (0.0622)	0.386*** (0.0620)	0.371*** (0.0614)	0.361*** (0.0621)	0.351*** (0.0617)	0.377*** (0.0601)	0.351*** (0.0622)	0.346*** (0.0620)	0.373*** (0.0603)	0.360*** (0.0624)	0.349*** (0.0622)	0.377*** (0.0605)
Afforestation	0.479*** (0.135)	-0.122 (0.154)	0.167 (0.141)	-0.102 (0.154)	0.305** (0.134)	0.419*** (0.134)	0.396*** (0.133)	-0.166 (0.149)	0.414*** (0.134)	0.400*** (0.133)	-0.199 (0.149)	0.426*** (0.135)	0.403*** (0.134)	-0.196 (0.150)
PiS result (2019)		0.00659*** (0.000839)		0.00497*** (0.00115)				0.00451*** (0.000839)			0.00489*** (0.000835)			0.00494*** (0.000840)
Std. Dev. of PiS results (2005-2019)			0.0162*** (0.00236)	0.00663** (0.00323)										
Mayor from PiS					0.189*** (0.0271)			0.156*** (0.0270)			0.156*** (0.0270)			0.154*** (0.0272)
Mayor from opposition					-0.133*** (0.0208)			-0.140*** (0.0203)			-0.142*** (0.0204)			-0.140*** (0.0205)
Hometown of PiS MPs (core + factions + switchers)						0.104*** (0.0204)								
Hometown of opposition MPs (switchers + core)						-0.00848 (0.0142)								
Hometown of PiS MPs (core)							0.173*** (0.0235)	0.153*** (0.0232)						
Hometown of PiS MPs (factions)							-0.244*** (0.0698)	-0.245*** (0.0679)						
Hometown of PiS MPs (switchers)							-0.0531 (0.124)	-0.0407 (0.121)						
Hometown of opposition MPs (switchers)							0.154 (0.104)	0.0917 (0.102)						
Hometown of opposition MPs (core)							-0.00318 (0.0149)	0.00764 (0.0146)						
Birthtown of PiS MPs (core + factions + switchers)									0.0561** (0.0222)					
Birthtown of opposition MPs (switchers + core)									0.0101* (0.00576)					
Birthtown of PiS MPs (core)										0.105*** (0.0242)	0.0911*** (0.0236)			
Birthtown of PiS MPs (factions)										-0.247*** (0.0692)	-0.253*** (0.0672)			
Birthtown of PiS MPs (switchers)										-0.205 (0.130)	-0.214* (0.126)			
Birthtown of opposition MPs (switchers)										0.159 (0.126)	0.130 (0.123)			
Birthtown of opposition MPs (core)										0.0149** (0.00592)	0.0181*** (0.00575)			
Hometown of PiS MPs (core + factions + switchers) - inv. function												0.0812** (0.0326)		
Hometown of opposition MPs (switchers + core) - inv. function												0.0162 (0.0200)		
Hometown of PiS MPs (core) - inv. function													0.166*** (0.0371)	0.137*** (0.0363)
Hometown of PiS MPs (factions) - inv. function													-0.550*** (0.142)	-0.539*** (0.138)
Hometown of PiS MPs (switchers) - inv. function													0.0183 (0.159)	0.0608 (0.154)
Hometown of opposition MPs (switchers) - inv. function													0.283 (0.206)	0.205 (0.200)
Hometown of opposition MPs (core) - inv. function													0.0279 (0.0207)	0.0414** (0.0202)
Constant	13.40*** (0.326)	12.39*** (0.347)	12.66*** (0.340)	12.33*** (0.348)	13.25*** (0.320)	14.20*** (0.350)	14.46*** (0.352)	13.62*** (0.368)	14.29*** (0.353)	14.49*** (0.354)	13.62*** (0.370)	14.05*** (0.349)	14.28*** (0.350)	13.39*** (0.366)
Observations	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476
R-squared	0.695	0.702	0.700	0.703	0.707	0.701	0.705	0.721	0.700	0.703	0.721	0.698	0.701	0.718

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. Estimation results (municipalities, lower house MPs only)

	Dependent variable: log of Total grants per capita													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Municipality-level variables														
Log of population	-0.679*** (0.0147)	-0.648*** (0.0150)	-0.645*** (0.0153)	-0.641*** (0.0153)	-0.677*** (0.0144)	-0.717*** (0.0162)	-0.722*** (0.0163)	-0.694*** (0.0165)	-0.718*** (0.0164)	-0.722*** (0.0165)	-0.694*** (0.0167)	-0.703*** (0.0159)	-0.709*** (0.0160)	-0.681*** (0.0161)
Log of PIT per capita	0.250*** (0.0367)	0.346*** (0.0383)	0.313*** (0.0374)	0.350*** (0.0382)	0.265*** (0.0359)	0.184*** (0.0387)	0.175*** (0.0388)	0.265*** (0.0399)	0.180*** (0.0390)	0.172*** (0.0390)	0.264*** (0.0402)	0.203*** (0.0384)	0.193*** (0.0385)	0.286*** (0.0395)
Log of CIT per capita	-0.0127* (0.00655)	-0.00240 (0.00662)	-0.00277 (0.00667)	-0.000467 (0.00666)	-0.0118* (0.00637)	-0.00902 (0.00655)	-0.00857 (0.00653)	-0.000539 (0.00643)	-0.00884 (0.00656)	-0.00850 (0.00655)	-0.000102 (0.00645)	-0.0100 (0.00656)	-0.00934 (0.00656)	-0.000732 (0.00645)
Log of agr. tax per capita	0.0134* (0.00744)	0.00434 (0.00745)	0.00120 (0.00758)	0.00105 (0.00756)	0.0128* (0.00726)	0.0112 (0.00745)	0.0110 (0.00744)	0.00392 (0.00728)	0.0104 (0.00746)	0.0101 (0.00744)	0.00284 (0.00728)	0.0105 (0.00746)	0.0105 (0.00745)	0.00312 (0.00729)
Debt to revenues	0.304*** (0.0608)	0.324*** (0.0601)	0.317*** (0.0602)	0.325*** (0.0600)	0.305*** (0.0592)	0.304*** (0.0604)	0.301*** (0.0603)	0.317*** (0.0583)	0.298*** (0.0605)	0.301*** (0.0604)	0.318*** (0.0585)	0.302*** (0.0606)	0.302*** (0.0606)	0.320*** (0.0586)
Afforestation	0.231 (0.164)	-0.110 (0.168)	0.0778 (0.163)	-0.0910 (0.167)	0.158 (0.160)	0.190 (0.164)	0.179 (0.163)	-0.132 (0.164)	-0.132 (0.164)	0.157 (0.163)	-0.165 (0.164)	0.180 (0.164)	0.167 (0.164)	-0.161 (0.164)
PiS result (2019)		0.00880*** (0.00114)		0.00643*** (0.00148)				0.00651*** (0.00113)			0.00677*** (0.00113)			0.00693*** (0.00113)
Std. Dev. of PiS results (2005-2019)			0.0189*** (0.00274)	0.00889** (0.00357)										
Mayor from PiS					0.201*** (0.0257)			0.189*** (0.0254)			0.187*** (0.0254)			0.186*** (0.0255)
Mayor from opposition					-0.136*** (0.0193)			-0.134*** (0.0191)			-0.133*** (0.0191)			-0.133*** (0.0191)
Hometown of PiS MPs (core + factions + switchers)					0.0929*** (0.0233)									
Hometown of opposition MPs (switchers + core)					0.00854 (0.0169)									
Hometown of PiS MPs (core)							0.142*** (0.0265)	0.134*** (0.0257)						
Hometown of PiS MPs (factions)							-0.128* (0.0761)	-0.117 (0.0736)						
Hometown of PiS MPs (switchers)							-0.0530 (0.118)	-0.0459 (0.114)						
Hometown of opposition MPs (switchers)							0.190* (0.105)	0.137 (0.102)						
Hometown of opposition MPs (core)							0.00477 (0.0180)	0.00451 (0.0174)						
Birthtown of PiS MPs (core + factions + switchers)									0.0512** (0.0236)					
Birthtown of opposition MPs (switchers + core)									0.0139** (0.00690)					
Birthtown of PiS MPs (core)										0.0841*** (0.0258)	0.0771*** (0.0250)			
Birthtown of PiS MPs (factions)										-0.169** (0.0767)	-0.154** (0.0742)			
Birthtown of PiS MPs (switchers)										-0.171 (0.123)	-0.187 (0.119)			
Birthtown of opposition MPs (switchers)										0.170 (0.127)	0.169 (0.123)			
Birthtown of opposition MPs (core)										0.0166** (0.00701)	0.0158** (0.00680)			
Hometown of PiS MPs (core + factions + switchers) - inv. function												0.0450 (0.0457)		
Hometown of opposition MPs (switchers + core) - inv. function												0.0447* (0.0267)		
Hometown of PiS MPs (core) - inv. function													0.127** (0.0534)	0.119** (0.0518)
Hometown of PiS MPs (factions) - inv. function													-0.496** (0.205)	-0.451** (0.198)
Hometown of PiS MPs (switchers) - inv. function													0.0262 (0.150)	0.0713 (0.145)
Hometown of opposition MPs (switchers) - inv. function													0.402* (0.235)	0.340 (0.228)
Hometown of opposition MPs (core) - inv. function													0.0432 (0.0285)	0.0404 (0.0276)
Constant	12.50*** (0.349)	11.10*** (0.388)	11.56*** (0.370)	11.03*** (0.388)	12.39*** (0.342)	13.29*** (0.380)	13.41*** (0.381)	12.20*** (0.418)	13.34*** (0.384)	13.44*** (0.385)	12.19*** (0.421)	13.05*** (0.374)	13.17*** (0.376)	11.92*** (0.411)
County-level variances														
Constant	0.0220 (0.0043)	0.0197 (0.0039)	0.0191 (0.0039)	0.0190 (0.0038)	0.0239 (0.0044)	0.0213 (0.0043)	0.0207 (0.0042)	0.0211 (0.004)	0.0213 (0.0042)	0.0211 (0.0042)	0.0215 (0.004)	0.0218 (0.0043)	0.0215 (0.0042)	0.0216 (0.0041)
Constituency-level variances														
Constant	0.0216 (0.0063)	0.0211 (0.0061)	0.0209 (0.006)	0.0211 (0.0061)	0.0212 (0.0063)	0.0230 (0.0072)	0.0224 (0.007)	0.0220 (0.0068)	0.0225 (0.007)	0.0218 (0.0067)	0.0210 (0.0065)	0.0223 (0.0068)	0.0220 (0.0067)	0.0215 (0.0065)
Number of observations	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476	2476
LR test (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6. Estimation results (counties, lower house MPs only)

	Dependent variable: log of Total grants per capita													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
County-level variables														
Log of population	-0.321*** (0.0419)	-0.336*** (0.0404)	-0.300*** (0.0413)	-0.333*** (0.0419)	-0.312*** (0.0397)	-0.266*** (0.0466)	-0.277*** (0.0471)	-0.287*** (0.0437)	-0.258*** (0.0460)	-0.259*** (0.0461)	-0.269*** (0.0431)	-0.268*** (0.0456)	-0.275*** (0.0457)	-0.286*** (0.0424)
Log of PIT per capita	0.0418 (0.146)	0.287** (0.146)	0.169 (0.144)	0.285* (0.146)	0.0521 (0.140)	0.199 (0.149)	0.190 (0.149)	0.315** (0.148)	0.191 (0.147)	0.187 (0.147)	0.317** (0.147)	0.172 (0.150)	0.165 (0.150)	0.316** (0.148)
Log of CIT per capita	-0.174*** (0.0398)	-0.130*** (0.0393)	-0.131*** (0.0404)	-0.127*** (0.0399)	-0.154*** (0.0379)	-0.177*** (0.0390)	-0.169*** (0.0395)	-0.123*** (0.0377)	-0.179*** (0.0388)	-0.176*** (0.0390)	-0.129*** (0.0375)	-0.178*** (0.0394)	-0.173*** (0.0396)	-0.126*** (0.0377)
Log of agr. tax per capita	0.207*** (0.0179)	0.197*** (0.0171)	0.184*** (0.0178)	0.195*** (0.0179)	0.206*** (0.0169)	0.203*** (0.0176)	0.202*** (0.0178)	0.195*** (0.0166)	0.197*** (0.0175)	0.198*** (0.0176)	0.196*** (0.0165)	0.203*** (0.0177)	0.200*** (0.0181)	0.193*** (0.0168)
Debt to revenues	-0.483** (0.202)	-0.280 (0.199)	-0.342* (0.201)	-0.277 (0.199)	-0.289 (0.192)	-0.398** (0.200)	-0.428** (0.201)	-0.129 (0.191)	-0.326 (0.201)	-0.298 (0.203)	-0.0362 (0.193)	-0.448** (0.201)	-0.451** (0.203)	-0.146 (0.192)
Afforestation	0.651*** (0.168)	0.770*** (0.161)	0.735*** (0.163)	0.773*** (0.162)	0.541*** (0.159)	0.667*** (0.165)	0.670*** (0.165)	0.630*** (0.156)	0.666*** (0.163)	0.669*** (0.163)	0.634*** (0.156)	0.650*** (0.166)	0.663*** (0.167)	0.641*** (0.157)
PiS result (2019)		0.0128*** (0.00239)		0.0119*** (0.00359)				0.00929*** (0.00264)			0.00928*** (0.00264)			0.0102*** (0.00261)
Std. Dev. of PiS results (2005-2019)			0.0348*** (0.00838)	0.00416 (0.0124)										
Mayor from PiS					0.418*** (0.151)			0.212 (0.159)			0.232 (0.160)			0.204 (0.160)
Mayor from opposition					-0.514*** (0.0827)			-0.483*** (0.0827)			-0.453*** (0.0826)			-0.457*** (0.0831)
Hometown of PiS MPs (core + factions + switchers)						0.0505** (0.0255)								
Hometown of opposition MPs (switchers + core)						-0.0750*** (0.0192)								
Hometown of PiS MPs (core)							0.0648** (0.0293)	0.0576** (0.0278)						
Hometown of PiS MPs (factions)							0.0569 (0.0826)	0.0195 (0.0766)						
Hometown of PiS MPs (switchers)							-0.155 (0.125)	-0.145 (0.116)						
Hometown of opposition MPs (switchers)							0.0371 (0.109)	-0.0734 (0.102)						
Hometown of opposition MPs (core)							-0.0830*** (0.0203)	-0.0636*** (0.0191)						
Birthtown of PiS MPs (core + factions + switchers)									0.0604** (0.0246)					
Birthtown of opposition MPs (switchers + core)									-0.0333*** (0.00764)					
Birthtown of PiS MPs (core)										0.0672** (0.0274)	0.0419 (0.0260)			
Birthtown of PiS MPs (factions)										0.0522 (0.0822)	0.0197 (0.0766)			
Birthtown of PiS MPs (switchers)										-0.102 (0.135)	-0.120 (0.125)			
Birthtown of opposition MPs (switchers)										-0.0442 (0.138)	-0.116 (0.129)			
Birthtown of opposition MPs (core)										-0.0335*** (0.00779)	-0.0221*** (0.00750)			
Hometown of PiS MPs (core + factions + switchers) - inv. function												0.0316 (0.0494)		
Hometown of opposition MPs (switchers + core) - inv. function												-0.0727** (0.0296)		
Hometown of PiS MPs (core) - inv. function													0.0276 (0.0589)	0.0324 (0.0551)
Hometown of PiS MPs (factions) - inv. function													0.297 (0.225)	0.241 (0.209)
Hometown of PiS MPs (switchers) - inv. function													-0.180 (0.160)	-0.142 (0.148)
Hometown of opposition MPs (switchers) - inv. function													0.0382 (0.242)	-0.106 (0.225)
Hometown of opposition MPs (core) - inv. function													-0.0900*** (0.0315)	-0.0733** (0.0294)
Constant	11.28*** (1.121)	8.824*** (1.167)	9.673*** (1.157)	8.797*** (1.171)	11.08*** (1.075)	9.522*** (1.218)	9.699*** (1.225)	8.299*** (1.252)	9.515*** (1.205)	9.535*** (1.205)	8.093*** (1.239)	9.769*** (1.213)	9.897*** (1.217)	8.269*** (1.240)
Constituency-level variances														
Constant	0.0127 (0.0072)	0.0066 (0.0057)	0.0071 (0.0058)	0.0066 (0.0057)	0.0136 (0.0069)	0.0103 (0.0064)	0.0103 (0.0064)	0.0100 (0.006)	0.0097 (0.0063)	0.0093 (0.0062)	0.0096 (0.006)	0.0115 (0.0068)	0.0116 (0.0068)	0.0098 (0.006)
Number of observations	380	380	380	380	380	380	380	380	380	380	380	380	380	380
LR test (p-value)	0.0065	0.0744	0.0617	0.0734	0.0019	0.0152	0.0151	0.0104	0.0192	0.024	0.0134	0.0092	0.0087	0.012

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1