The analysis aims to present and assess the impact of historical factors on the differences in socio-economic development of Poland at the local level and to compare them to the results of other research that show the effects of similar analyses carried out for the countries of Central and Eastern Europe. The study is based on the analysis of spatial diversification of the socio-economic development level classes and indicators of the electoral support structure of residents by means of spatial regression methods. The spatial scope of the work includes the local, or the commune level (LAU2) and furthermore takes into account the division of the present-day territory of Poland by the relict borders of partitions (1772, 1793, 1795), established at the Congress of Vienna (1815) and the course of Poland's borders between the world wars (1918-1939), conclusively determined in 1922. The main timeline of the study is the years 2004-2016 and, retrospectively, the 1815-1939 period.
Introduction

Europe's socio-economic space is one of the most experienced in terms of the impact of historical events of breakthrough development shocks, which affect its diversity. Central and Eastern Europe is unique in this respect. The number and scale of war conflicts and their consequences in the form of changes in the political borders of individual countries and regions have taken root in this space, becoming an important determinant differentiating development opportunities (Huntington, 1998; Prescott and Triggs, 2008). Their importance is currently increasing in the absence of satisfactory effects of cohesion policy interventions, both at the EU level and within individual Member States (Fratesi and Rodriguez-Pose, 2016).

This analysis aims to present and assess the impact of historical factors on the differences in socio-economic development of Poland at the local level and to compare them to the results of other studies that show the effects of similar analyses carried out for the countries of Central and Eastern Europe. The study is based on the analysis of spatial diversification of the socio-economic development level classes and indicators of the electoral support structure of residents by means of spatial regression methods. The spatial scope of the work includes the local, or the commune level (LAU2) and furthermore takes into account the division of the present-day territory of Poland by the relict borders of partitions (1772, 1793, 1795), established at the Congress of Vienna (1815) and the course of Poland's borders between the world wars (1918-1939), conclusively determined in 1922. The main timeline of the study is the years 2004-2016 and, retrospectively, the 1815-1939 period.

The investigation algorithm consists of five stages. In the first stage, a review of the research on the relict boundaries and their importance in the spatial differentiation of socio-economic developments in Central and Eastern Europe was carried out. In the second stage, the division of Poland's today's territory by the relict borders was discussed. In the next, third stage the results of the analysis of differentiation of the level of social and economic development of local units, taking into account the map of relict borders, were presented. Stage four was devoted to the description of the spatial distribution of political preferences in the system of local units in the context of historical conditions. In the final, fifth stage, the regularities and relationships between the relict borders and the spatial distribution of the socio-economic development level and political preferences at the local level were discussed.

The model approach applied in this study corresponds to the developmental differences highlighted in the latest results of spatial research. It draws attention to the increasingly evident relationship between political preferences and the level of economic and social development, which are often based on common historical conditions (Rodriguez-Pose, 2017). As a consequence, it is assumed that the so-called relict borders representing the historical systems
which are well-established in social and economic life, determine to a large extent the current spatial differences in the level of social and economic development and political preferences. Importantly, differences in political preferences are at the same time strongly correlated with different levels of development. As a result, the spatial structure of political support becomes an indicator of the economic and social situation determined by historical conditions. This study is carried out as part of the FORSED research project (www.forsed.amu.edu.pl) funded by the National Science Center (No. 2015/19/B/HS5/00012): New challenges of regional policy in shaping socio-economic development factors of less developed regions.

Relict boundaries and their significance for spatial differences in development processes in Central and Eastern Europe

The historical background is one of the main reasons for the differences in the current development situation of individual territories. Political divisions and their consequences connected with functioning in different political, economic and social conditions, in line with the principle of path dependence, become deep-seated determinants of developmental processes, stressing the fact that “history matters” (Peters et al., 2005; Boas, 2007). The research on relict boundaries and their significance in the spatial differentiation of socio-economic phenomena covers both theoretical and empirical aspects (Hartshorne, 1933; Kolossov, 2005; Prescott, Triggs, 2008).

Central and Eastern Europe is of special interest for research on the impact of historical conditions, evident in the influence of relict boundaries, on the present-day differentiation of economic and social processes. This area has experienced especially challenging political divisions and as a consequence can be called a testing ground for studies on relict and phantom boundaries (Löwis, 2017; Hirschhausen, 2017). The studies are primarily based on descriptive methods, which take advantage of analyses of historical and contemporary sources (desk research). Detailed methodology differs depending on the scale of research. Analyses related to macroscale systems most often apply identification and interpretation of the spatial arrangement\(^1\) of values of simple indicators which define the economic, social and environmental impact of spatial units and of the political behaviour of their residents (e.g. Kowalski, 2000; Kosmala, 2003; Biondich, 2011; Jańczak, 2015; Zamfira, 2015). Within microscale systems, the dominant methods and techniques of direct studies include e.g. inventories, interviews, questionnaires, etc. (Sobczyński, 1984; Löwis, 2017). Some studies apply moreover the synthetic indicator method (e.g. Bański et al., 2011) and methods of analyses of connections and relations based on models of correlation and regression, supposed

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\(^1\) In current studies with the aid of GIS techniques (e.g. Šimon, 2015).
to confirm in econometric terms the coexistence of certain phenomena or the existence between them of causal relations (Grabowski, 2018). The spatial scope of these surveys allows for the identification of several sub-areas which are the subject of detailed inquiries concerning Central and Eastern Europe.

The first of them is the territory of Poland2, which was also analysed in the pioneer work by R. Hartshorn (1933), who examined the consequences of changes of boundaries in Upper Silesia in the first period of delineating the borders of the Second Polish Republic (1918-1939). The results obtained helped the author come up with a critique of the then political divisions, which showed an impact of relict boundaries, and were a kind of testing ground for this new research current. R. Hartshorn (1933, p. 224) pointed out that “...the political boundaries, representing diplomatic compromises, add to the confusion, geographically, by neglecting for the most part any one geographic boundary, and thereby developing a new one and, in particular, by cutting through the very type of cultural landscape least suitable for boundary location...” One should indicate a few principal lines of research on regularities related to the historical background of the spatial differences in Poland, taking into account the relict boundaries. Analysis of spatial diversity of electoral behaviours and their determinants is the basic direction of research. In his analysis, showing Poland’s electoral geography in the 1989-1998 period, M. Kowalski (2000, p. 8) points out the “…historical and cultural, or developmental and cultural conditions affecting political divisions ...” The author’s results are confirmed, too, by the outcomes of earlier analyses of economic prosperity and social mobilisation, by G. Gorzelak and B. Jałowiecki (1998). They point to the mutual overlap in space of social and economic determinants, taking account both the economic and social aspects related e.g. with the presence of religious minorities (e.g. Orthodox Church in Eastern Podlasie) and ethnic minorities3 (e.g. German minority in Opolskie, Kashubs). Regularities are likewise identified in the work by J. Bański et al. (2009), analysing the electoral preferences of residents of Polish rural areas. The results obtained in the course of research lead to the following conclusion: “…among the determinants of electoral behaviour, the social and professional profile of the population and the broadly understood historical and cultural conditions are of fundamental importance (...) The electoral behaviour of some regional groups forming 'pockets of difference' makes it difficult to unambiguously assess the impact of particular determinants

2 The origins of geographic, political science, sociological, and ethnographic studies on the relict boundaries in Poland’s geography hark back to the 1960s. Earlier Polish research on boundaries focused more on the mapping out of the boundaries than on their impact on economic and social processes.

3 Interesting studies of ethnic conditions occurring in historical areas of the Polish borderlands are to be found in Urbatsch (2017), whose work points to the negative impact of mass repatriation movements on the current economic situation of the relict borderland of Poland and Germany within the so-called regained territories, incorporated into Poland after 1945.
on electoral preferences. However, research to date shows that these conditions are clearly related to each other, and these relationships seem to be stronger in rural areas than in urban areas...” (Bański et al., 2009, p. 503). The spatial distribution of political support variability in rural areas is very interesting. This variability depends on the system of beliefs, symbols, values, and behaviours of social capital, different in the areas inhabited by persons displaced and settled there after 1945 and in the areas inhabited by indigenous population. As a result, as J. Bański et al. (2009, p. 499) indicates, inhabitants of rural areas in Western Poland “...follows more economic considerations, hence the changeability and lack of support for the options which were earlier in power and have ‘compromised’ themselves...”, while Poles living in Eastern Poland “... take into consideration ideological (political) aspects to a greater extent....”.

Similarly, in his research T. Zarycki (2015) links the differences in political behaviour in terms of the division of Polish territory between the three annexing powers in the 19th century to the contemporary structure of electoral support and to the diversity on a local scale of the three capitals, which are important factors of economic, social and cultural development. A very interesting and methodologically original study of the regularity of spatial diversity of electoral behaviour in Poland during the last parliamentary elections in 2015 in the context of the impact of relict boundaries and the formation of their phantom equivalents is provided by W. Grabowski (2018). A third noteworthy current of research is that analysing the interdependencies and differences between the position of relict boundaries (Kosmala, 2003), paleo-boundaries (Matykowski, 2004) and symbolic boundaries and contemporary administrative divisions (Matykowski, 2009). Here the authors point to the consequences of a lack of alignment of these borders on the process of development of economic regions and the degree of their closure.

Ukraine, which S. Huntington (1998) treats as an example of a country divided by a developmental gap, is especially tried by history (Magocsi, 2010) and is the second major geographical focus of studies on relict boundaries. Analyses relating to this area are both comprehensive approaches taking into account general tendencies and dependencies that result from the relations between electoral behaviours and the position of phantom borders (Putrenko, 2013), as well as detailed analyses carried out on a microscale of individual villages located in historical borderland areas (Löwis, 2017). The results of the studies justify the following conclusion: “…geographical conditions and local events play a central role in the definition of regional cultural specificities, without it being possible to assert that these spaces possess specific properties or identities. The events that occurred in concrete places and spaces serve to create symbolic spheres that take on meaning or to which meaning is attributed a

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posteriori...” (Löwis, 2017, p. 14), stressing the significance of historical conditions for today’s developmental potential.

The third area is the selected countries of Central and Eastern Europe with ethno-political relations within their borders, which are confirmed by the results of studies on the conflict-generation potential of changes in the administrative divisions of the area, for example regarding the ethnic diversity of Transylvania (Kürti, 2001). The results of the analysis of relations between the distribution of ethnic minorities in Romania, Bulgaria, the Czech Republic, and Slovakia and the diversity of electoral behaviours and socio-economic conditions indicate the importance of intra- and inter-ethnic relations (Gherghina, Jiglău, 2011) in shaping spatial regularities. They are expressed in the emergence of phantom boundaries strictly corresponding to the spatial range of occurrence of a given minority, regardless of the degree of ethnic homogeneity of a given state (Zamfira, 2015). Against this background, other contemporary analyses deserve attention, which, based on the experiences of the indicated areas, characteristic for political divisions in Central and Eastern Europe, using a proven methodology and based on the identified regularities, relate them to the relatively recent divisions.

In most of the above analyses, the basic determinant of the current economic and social situation is the historical identity of a given territory and its relations to the relict border (Cox, 1968). In the case of political behaviour, attention is also drawn to the regularities, according to which areas with a higher level of modernisation and urbanisation show a higher degree of spatial homogeneity of behaviour, e.g. related to elections, usually in favour of a more liberal or middle-of-the-road option (Cambell et al., 1996, Cox 1969, Grabowski 2018). In this way, as assumed in this study, political behaviour becomes an indicator of the history-determined economic and social situation. This is particularly evident in the last decade in which, as A. Rodríguez-Pose (2017, p. 189) claims: “…persistent poverty, economic decay and lack of opportunities are at the root of considerable discontent in declining and lagging-behind areas the world over...” This is testament to the inefficiency of earlier developmental intervention (Rodriguez-Pose and Fratesi, 2007; Fratesi and Rodríguez-Pose, 2016) and may trigger deeply rooted populism, evident in electoral behaviour in economically less well-off areas, whose development is often “locked” in their history. This makes it even more difficult for these territories to break the closed circle of poverty, which regrettably becomes their permanent feature in many locations worldwide (Bachmann, Sidaway, 2016; Gros, 2016; Rodrik, 2017). The regularities arising from the lack of social approval for the growing development gaps take the form of a certain revenge of the “places that don’t have a future”, which do not want to remain “places that don’t matter” (Rodríguez-Pose, 2017).
Local socio-economic development in the context of relict boundaries

Poland, due to the fact that its external borders have undergone frequent changes, is a good example of the formation and persistence of relict boundaries. A key role in this respect was played by the lack of independent statehood for a period of 123 years (1795-1918), during which Polish territory was divided among three European powers: Prussia, Russian Empire and Austria. The Duchy of Warsaw, established in 1807 due to the Napoleonic wars, was as early as 1815 made permanently dependent on Russia after the Congress of Vienna and renamed the Polish Kingdom. Its boundaries are the first historical set-up taken into account in this study (Figure 1). It is of unique significance due to the fact that the Polish Kingdom borders were the longest-lasting political boundaries on Polish lands in the last 200 years. Interestingly, some of its sections (in Mazury and Upper Silesia) were especially unchanging and had operated as state borders since the Middle Ages (Sobczyński, 1993). The second set-up scrutinised in this study concerns the borders of the Second Republic of Poland formed after regaining independence and in force during the interwar period (1918-1939) (Figure 1).

Figure 1. Classification of communes by the level of socio-economic development

The layout of the borders of the Second Republic of Poland within the contemporary territory of Poland was mostly similar to the borders of the Polish Kingdom but it is worth to consider the new sections, in particular the Powiśle area, whose eastern part is a "young" border from the years 1920-1939, while the western part is an "old" border, whose origin harks back to the 11th century (Sobczyński, 1993). On the other hand, the section of the Wielkopolska border

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4 This classification of communes is the effect of a synthetic approach to 13 classifications from the 2004-2016 period, each time constructed on the basis of a five-degree classification of communes obtained through the value of the synthetic indicator (measured as the Bray-Curtis dissimilarity) and k-means clustering verified by the random forest procedure (for a more comprehensive description of the classification procedure see R. Perdál 2018).
and the southern part of the Upper Silesian section functioned as a political border only in the interwar period, hence it can be assumed that their layout to a lesser extent determines the social and economic phenomena than in the case of the more permanent borders from the time of the partitions of Poland.

The level of social and economic development of communes located in particular parts of the country, functioning until 1918 in various political, cultural and socio-economic systems, is evident in contemporary differences in social and economic development (Figure 1). The number of communes with a high level of development in the former Prussia-annexed territories is nearly twice as high as in the other partitions. In turn, the number of communes with a low development level is lower than in the territories of the Austrian partition only by close to 11 pp and lower than the Russian partition by 22 pp. Within the borders of the former Prussia-annexed territories, 34% of communes showed an average developed level; in the former Austria-annexed territories the figure stood at 28%, and in the Russian partition nearly 16%. The differences may stem from over one hundred years of operation of individual communes in different political and economic systems. Importantly, the time of partitions coincided with the first industrial revolution in Europe and with the dynamic growth of new sectors of the economy. The area partitioned between the three superpowers was greatly diversified as to the level of urbanisation and infrastructure development. In the Prussian partition, in 1910, 35% of the population lived in towns and the density of railway lines in 1914 was 11.2 km/100 km² (Jelonek, 1967, Taylor, 2007). At the same time, only 20% of people in the Austrian partition lived in towns and the density of railway lines was 5.6 km/100 km². In the Russia-annexed territories, the respective figures were 22% and a mere 3.6 km/100 km². The social and, above all, economic policy of the partitioning states towards Polish territories was very diverse. The Prussian authorities invested in transportation links between towns and the largest centres (including administrative centres). As a result, almost every city in the Prussian partition had access to railways. On the other hand, the Russian and Austrian authorities set up only the main lines connecting the largest urban centres, which often bypassed other large centres (e.g. Warsaw-Vienna Railway, Warsaw-Petersburg Railway, the Transversal Galicia Railway) (Taylor, 2007). In the Prussian partition, most of the present-day capitals of regions played major administrative roles. In 1910, Wrocław (512,000, the second largest city of the Kingdom of Prussia and the fifth largest of the German Empire), Szczecin (235,000), Gdańsk (170,000) and Poznań (157,000) were both capitals of provinces (regional units with self-government and provincial assembly) and of regencies (sub-regional unit). Regency capitals included Bydgoszcz (58,000), Olsztyn (33,000) and Opole (34,000), while Gorzów Wlkp. (39,000), Katowice (43,000), Toruń (46,000), and Zielona Góra (23,000) – were capitals of poviats. In
the Austrian partition, only Krakow played a major role. With close to 150,000 inhabitants, the city of the Austro-Hungarian Empire enjoyed a relatively high autonomy (initially Free City of Krakow, and later the Grand Duchy of Krakow). In turn, Rzeszów (24,000) was only the capital of Plzno circuit (an equivalent of a poviat). In the territories formerly annexed by Russia, most of the urban centres were neglected. In 1910, in the Polish Kingdom capitals of governorates (regional units with zero autonomy as to socio-economic matters) were Warsaw (895,000), Lublin (65,000) and Kielce (32,000), while the dynamically developing Łódź, with 424,000 inhabitants, was merely a poviat capital in Piotrków Governorate. In turn, Białystok (80,000) was outside the borders of the Polish Kingdom yet within the borders of the Russian Empire, in Grodno Governorate. In the 1815-1914 period, in the Russian partition (only within the present-day borders of Poland) slightly over 400 towns lost their city rights. At that time, in the Austrian partition only 1 town lost city rights and in the Prussian partition – 34 towns.

The partition layouts are responsible for evident differences in the population of communes, as witnessed by the structures of communes according to the level of social and economic development in the three partitions. This was confirmed by the Pearson test of significant differences, $\chi^2_{Pearson}$, for RC tables ($p = 0.0000$). This demonstrates that there is a correlation between the level of the social and economic development of communes and their historical background.

Apart from the current level of the social and economic development, the territories within the borders of the former partitions differ today also in the functional structure of territorial units\(^5\) (independent of administrative status). In the territories formerly annexed by Prussia, relative to the other partitions, there is the biggest number of urban communes (58%), urban-rural communes (50%) and rural-urban ones (56%). Furthermore, in the former Prussian partition the participation of rural communes is relatively the lowest (47%) in the structure of this area, while e.g. in the former Russian partition the participation of such communes is the highest – close to 74%.

**Spatial diversity of political preferences**

Current analyses of the diversity of political preferences in Poland on a regional and local scale indicate very significant and persistent disproportions in electoral decisions (Zarycki, 2015; Kowalski, 2016; Grabowski, 2018). In Poland, the time of the partitions is seen as the period having the biggest impact on the durability of spatial diversity of political preferences.

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\(^5\) Analysis of functional types identified communes with dominant features: urban, urban-rural, rural-urban, and rural. The classification of these communes took into account variables concerning, among others, the structure of population by age and employment sectors, the structure of land use, the structure of use of buildings and their equipment with municipal facilities, the structure of enterprises and agricultural households (see GUS 2015).
preferences. It is assumed that this is the result of divergent levels of economic development of the partitioning powers, which influenced the differences in the level of development of the then Polish lands. In addition, the different social and cultural patterns and ideological orientations in the particular partitions as well as the policy of the partitioning superpowers towards the Polish population influenced the process of formation of these patterns (Raciborski, 1997). Analysis of the results of elections held in Poland since 1989 indicates the persistence of relict boundaries as to political preferences (Grabowski, 2018). This means that the structure of electoral support in neighbouring municipalities does not differ significantly from each other provided the administrative units concerned lie within the same former partition. There are marked differences between neighbouring administrative units located within areas which formerly belonged to different partitions. Studies show that, in a generalised perspective, the inhabitants of the former Prussian partition are more willing to support liberal parties (left-wing, modern), while the inhabitants of the former Russian or Austrian partitions tend to vote for conservative, right-wing parties (Matykowski, 2007; Zarycki, 2015).

This can be explained, among others, by historical differences in the structure of farms, socio-economic development level and characteristics of the inhabitants. In the 19th century, farms located in the areas of the former Prussian partition were more innovative and richer, which gave rise to a surplus of agricultural production and contributed to a faster development of cities in present-day Western Poland. According to J. Bartkowski (2007), economic development and improvement of the material situation of the inhabitants of the partition was a way of cultivating the Polish national spirit, which resulted from the higher effectiveness of Polish enterprises, which had to compete with German ones. This led to the emergence of the so-called middle class in the Prussian partition on a larger scale than in the other partitions, and to this day the inhabitants of this part of Poland generally vote for parties supporting the creation of good conditions for the emergence of the middle class, i.e. liberal parties willing to introduce innovation. A similar trend applies to so-called regained territories, settled after World War II by displaced people with a relatively low level of conservatism, a lower level of national identification, but with a higher level of innovation, mobility and openness. These features are responsible for the fact that the inhabitants of Western Poland vote more often for liberal and left-wing parties. In turn, in the territories of the former Russian and Austrian partitions, especially in rural areas with the tradition of private ownership in agriculture, whose inhabitants show a relatively high level of conservatism, religious belief and national identity, there is a persistently high support of conservative and right-wing parties (Bański et al., 2009).

Interestingly, different political preferences, related to a higher level of support for liberal parties, can be observed in the strongly urbanised (i.e. with a higher level of
development) areas of the former Russian and Austrian partitions and in the autonomous units of those partitions. Within the Russian partition, this applies to the following: Warsaw and Łódź agglomerations and Grodno Governorate, until today inhabited by the Belorussian minority, Orthodox and Muslim descendants of Polish Tatars (Janicki 2000; Węcławowicz 2018). In the Austrian partition these are: Free City of Krakow and the Duchy of Cieszyn (as well as Bieszczady Mountains, with a high percentage of migrant population from different Polish regions which was a consequence of the Operation “Vistula”)\(^6\).

Political preferences considered through the prism of voting results (percentage of votes won) in the second round of the presidential elections in 2005 and 2015 for the victorious candidates representing the conservative-right electorate confirm the spatial diversity of electoral behaviour in the context of the influence of relic boundaries (Presidents of the Republic of Poland: Lech Kaczyński and Andrzej Duda) (Figure 2).

Figure 2. Level of political support and layout of relict boundaries

In 2005, L. Kaczyński received the highest support on communes of Central and South-Eastern Poland, i.e. in the territories of the former Russian and Austrian partition (except highly-urbanised autonomous units: Free City of Krakow, Duchy of Cieszyn and a part of the Grodno Governorate and the Bieszczady Mountains). In this part of Poland, the level of support ranged from over 90% in several rural communes (mainly the former Russian partition) to 40% in a

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\(^6\) The operation “Vistula” was a forced pacification action of a military character carried out in the years 1947-1950 by the state structures of the Polish People’s Republic against the Ukrainian Insurgent Army (UPA) and the Organisation of Ukrainian Nationalists operating on the territory of Poland in order to cut off the fighting units from the natural base. The operation consisted in the mass displacement of civil population from south-eastern Poland (mainly from Bieszczady) to Western Territories. From the 1960s the repopulation of these areas started (e.g. by using financial incentives for migration) with people coming from various regions of Poland including large cities (Maryański 1963, Jadam 1976, Gawryszewski 2005).
few urban or urban-rural communes of both partitions. The same spatial distribution of support for the candidate of the right-wing electorate, although with lower shares, was recorded in 2015. The percentage of votes obtained by A. Duda ranged from over 90% in five communes of the former Russian partition to a mere 24.6% in the rural commune of Puńsk from the same partition, but with an over 70% of Lithuanian minority.

**Spatial interdependencies**

An attempt to explain the relations between membership in specific historical systems (i.e. the position of relict boundaries) and spatial distribution of the social and economic development level and functional structure of communes and spatial differentiation of election preferences, presented in the introduction, was carried out by means of regression models, in particular spatial models of regression. The procedure of regression modelling of the above relations took place in three stages. In the first stage, a simple and multiple regression method was used, in which structural parameters of the model were estimated with the use of Ordinary Least Squares (OLS) method. In the second stage, spatial regression models were used, in particular the Spatial Lag Models (SLM) and Spatial Error Models (SEM) models (Anselin 1988, Rogerson 2001). In the third stage, local models of spatial regression were used in the form of Geographically Weighted Regression (GWR) (Fotheringham et al. 2002).

The regression modelling procedure was preceded by the identification of the level of correlation between dependent and independent variables (p < 0.0000)\(^7\). The level of support for L. Kaczyński [KACZ] and A. Duda [DUDA] is: (1) negatively correlated with the position of communes in the territories formerly annexed by Prussia (ca. -0.72 each) and positively correlated with the position within the boundaries of the Second Republic (II RP; respectively, 0.60 and 0.55). In other words, a higher support of conservative and right-wing options can be found in the communes which are not located in the former Prussia-annexed territories but were within the boundaries of the Second Republic; (2) negatively correlated with the development

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\(^7\) Dependent variables: support level during presidential election in the second round for (1) L. Kaczyński (2005) and (2) A. Duda (2015). Independent variables: (1) persistence of historical layout: (a) binary values describing location in particular partitions: 1 – location in a given partition, 0 – location in another partition [variables: AUST, PRUS, ROSJ], (b) values 1-3 for communes located in partitions: 1 – Russian, 2 – Austrian, 3 – Prussian partition (ordering scale representing the level of socio-economic development of partitions – urbanisation and infrastructure levels) [variable: ZAB3], (c) binary values describing location in the Second Republic: 1 – location within the borders of the Second Republic, 0 – location outside the borders of the Second Republic [variable: IIRP], (2) socio-economic development level expressed by means of: (a) growth level class in 2005 and 2015: 1 – very low, 2 – low, 3 – average, 4 – high, 5 – very high development level [variables: LL05 and LL15], (b) synthetic approach (synthesis from 13 observations from 2004-2016): 1 – very low, 2 – low, 3 – average, 4 – high, 5 – very high development level [variable: SYNT]; (3) commune type: (a) administrative type: 1 – rural commune, 2 – urban-rural commune, 3 – urban commune [variable: TADM], (b) functional type: 1 – rural commune, 2 – rural-urban commune, 3 – urban-rural commune, 4 – urban commune [variable: TFUN].
level measured by the class of growth level \([LLxx]\) for 2005 and 2015 (respectively, -0.55 and -0.43). The persistence of these interlinks is confirmed by the high negative correlation with the synthetic indicator of growth (respectively, -0.56 and -0.47); (3) negatively correlated with the administrative type of communes \([TADM]\) and with the functional type \([TFUN]\), i.e. a higher support of conservative and right-wing options can be found in rural and rural-urban communes, while a lower support in urban and urban-rural communes.

From among the tested OLS models for the 2005 data\(^8\) representing various combinations explanatory variables, the best model\(^9\) was the one which accounted for the degree of support for L. Kaczyński \([KACZ]\) via the level of socio-economic development, as described by the class of growth level in 2005 \([LL05]\), functional type of the commune \([TFUN]\) and location in the area of the former Prussian partition \([PRUS]\). The values of the corrected coefficient were, respectively, 0.673 and 0.620, and therefore we can suspect that most of the changeability of support for both candidates is explained by the variables used. Spatial dependencies testing indicates that some variables that may be spatially correlated are not included in the model. This is confirmed by the high value of the global I-Moran’s statistics (respectively 0.570 and 0.645) expressing the level of spatial autocorrelation of residuals from regression models. It should be emphasized that the presence of residual autocorrelation negatively affects the accuracy of OLS estimators determination. Diagnostic tests investigating the level of spatial dependence show that there is both spatial autocorrelation of the random component, which suggests the use of SEM, and spatial autoregression, which indicates the potential use of SAR, in particular SLM. For both of the studied states as a result of modelling it turned out that SEM models with explanatory variables describing the level of socio-economic development \([LLxx]\), location on the lands of the former Prussian partition \([PRUS]\) and within the borders of the Second Republic \([IIRP]\) and the functional type \([TFUN]\) demonstrate the best information criteria (Table 1). Both models are characterized by high values of the determination coefficient, which indicates that the variables in the models explain almost 87% of the variability of the support value. The SEM model of support for A. Duda is characterized by a lower value of the AIC and Schwarz criteria. In both OLS models, the influence of residual autocorrelation was eliminated by estimating the SEM model. The SEM models obtained are characterized by significantly lower values of information criteria in relation to OLS models, which proves that SEM models are better suited to empirical data. This confirms the assumption that the level of support for L. Kaczyński and A. Duda stems primarily

\(^8\) The relatively high convergence of the results of both candidates and the level of correlation with the explanatory variables led to the assumption that the testing of different types and variants of regression models will be carried out only for the 2005 data, and then the best variants will be repeated for 2015.

\(^9\) I.e. with the lowest values of the Akaike and Schwarz criteria and the highest log likelihood values.
from: the level of social and economic development of communes (the lower the level of development, the higher the support), the functional type of the commune (the more urban the commune, the lower the support) as well as the location in the former Prussian partition (the lowest support) and in the territory of the Second Republic of Poland (the highest support).

The results of regressive modelling OLS and SEM indicate a lack of a permanent (in spatial terms) relation between the phenomena under scrutiny, which proves the so-called spatial heterogeneity (Fotheringham et al., 2002). It stems from the spatially (locally) different development level and functional type of communes and electoral preferences. Elimination of the negative influence of spatial heterogeneity is possible through the use of GWR, which helps to capture for each observation the variability of regression coefficients in space. The model parameters are estimated separately for each observation (local regression models), and their estimation takes into account explanatory variables from neighbouring observations, with the significance of subsequent observations decreasing with distance (Fotheringham et al., 2002).

Due to the limitations of the method related to the non-inclusion of binary variables in the GWR model, the introduction of variables related to the position in historical systems into the model was abandoned (incidentally, in line with the purpose of the method, local spatial relationships should still be revealed during the modelling). Thus, only the social and economic development level and functional type of the commune were taken into account in the modelling. The highest value of the corrected global determination coefficient for 2005 $R^2 = 0.873$ and for 2015 $R^2 = 0.880$ was obtained for models in which the explanatory variables were the level of socio-economic development expressed in five classes [LLxx] and in the functional type of the commune [TFUN]. The values of the AICc were, respectively 15940 and 15655, which demonstrates an even better adjustment of the GWR models than the SEM models. In turn, the effective number of parameters was, respectively, 552.04 and 713.07.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>KACZ</th>
<th>DUDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.869</td>
<td>0.871</td>
</tr>
<tr>
<td>Lambda (SEM)</td>
<td>0.816</td>
<td>0.870</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>3.778</td>
<td>5.391</td>
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<td>Log likelihood</td>
<td>-8070</td>
<td>-7942</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>16151</td>
<td>15894</td>
</tr>
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<td>Schwarz criterion</td>
<td>16180</td>
<td>15923</td>
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<table>
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<tr>
<th>Independent Variable</th>
<th>b</th>
<th>S.E.b</th>
<th>z-value</th>
<th>p</th>
<th>b</th>
<th>S.E.b</th>
<th>z-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>13.035</td>
<td>1.231</td>
<td>59.6</td>
<td>0.000</td>
<td>65.14</td>
<td>1.329</td>
<td>49.1</td>
<td>0.000</td>
</tr>
<tr>
<td>LL05 / LL15</td>
<td>-2.948</td>
<td>0.185</td>
<td>-15.9</td>
<td>0.000</td>
<td>-2.039</td>
<td>0.172</td>
<td>-11.9</td>
<td>0.000</td>
</tr>
<tr>
<td>PRUS</td>
<td>-8.482</td>
<td>1.003</td>
<td>-8.5</td>
<td>0.000</td>
<td>-6.166</td>
<td>1.045</td>
<td>-5.9</td>
<td>0.000</td>
</tr>
<tr>
<td>TFUN</td>
<td>-3.908</td>
<td>0.197</td>
<td>-19.9</td>
<td>0.000</td>
<td>-2.827</td>
<td>0.170</td>
<td>-16.6</td>
<td>0.000</td>
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<tr>
<td>IRP</td>
<td>8.302</td>
<td>0.976</td>
<td>8.5</td>
<td>0.000</td>
<td>5.184</td>
<td>0.974</td>
<td>5.3</td>
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<tr>
<td>Lambda</td>
<td>0.816</td>
<td>0.014</td>
<td>59.2</td>
<td>0.000</td>
<td>0.870</td>
<td>0.011</td>
<td>77.4</td>
<td>0.000</td>
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</tbody>
</table>

Diagnostics for: * heteroskedasticity / ** spatial dependence

Test value probability value probability
Breusch-Pagan* 7.4 0.11532 15.7 0.00350
Likelihood Ratio** 1615.045 0.00000 2134.397 0.00000

Source: own study.
The values of support for both candidates, estimated with the aid of GWR models, show a relatively high spatial convergence with the observed values (Figure 3). However, in the case of local GWR models, the level of individual adjustment oscillated from 0.00 to 0.80 (in 2015) and 0.88 (in 2005). In spatial terms, the areas of the Kingdom of Poland, Galicia and the Prussian partition, which found themselves within the borders of the Second Republic of Poland (Figure 3), showed the best adjustment in both models. The lowest adjustment of the models is clearly visible in the territories of Western and Northern Poland, incorporated into the Polish borders in 1945 and fragments of Grodno Governate and the vicinity of Suwałki, as well as the Bieszczady Mountains. This can be partly due to ignoring the ethnic and religious minorities living in these areas (e.g. Belarussian and Lithuanian minorities in Podlasie, including Orthodox Christians and Muslims; the German minority in Opole Silesia; descendants of Lemkas and Boykos – Greek Catholics and Orthodox Christians) and to the consequences of post-war migration (settlement of the territories obtained after the deportation of the Germans). This confirms the results of the aforementioned studies, in which it was established that such minorities demonstrate more liberal and less conservative political preferences.

Figure 3. Results of regressive modelling (GWR) of support for L. Kaczyński and A. Duda

Source: own study.

Discussion and summary

The study is part of a wide current of research on the influence of historical conditions on contemporary spatial diversification of social and economic processes in Central and Eastern
Europe, marking the influence of relict and phantom boundaries on the scope and spatial regularities of identified regularities.

The methodology adopted in the study broadens in a fundamental way the earlier analytical approaches and contributes to methodological progress in the relevant research carried out within Geographical Sciences. It indicates the usefulness of regression modelling, including the importance of GWR models for objective, statistical identification and interpretation of spatial relationships.

It has been proved that Poland is undoubtedly one of the most important testing grounds for studying the impact of historical determinants on the contemporary differentiation of development processes. This is due to the fact that it is an area particularly experienced by historical events, which have caused deep-seated and long-lasting changes in the layout of political boundaries.

The research findings confirm the existence of strong and statistically significant relations between the size and spatial structure of political preferences and spatial diversity of the level of social and economic growth in systems directly related to the course of relict borders in the area of today's Poland. In line with the assumptions of R. Hartshorn (1933), these borders are antecedent borders, i.e. they no longer have a political function, but are evident in the cultural diversity in economic, social and spatial terms (Prescott, Triggs, 2008) (e.g. western borders of the Polish Kingdom, simultaneously constituting the borders between the former Prussian and Russian partitions). The layout of the borders confirms the existence of phantom borders, i.e. virtual borders which come to the fore in the spatial diversity of the social and economic phenomena analysed, but which do not always correspond to the present and past territorial divisions (e.g. the present, eastern borderland of Poland affected by repatriation movements after 1945). The results confirm the regularities underlined by L. O'Dowd and T. Wilson (2002), drawing attention to the fact that in times of advancing economic integration, which weakens the importance of political borders, an increase in the importance of their relict counterparts can be observed. It is these relict boundaries that significantly and permanently impact the spatial diversity of developmental factors.

As a result of the application of GWR models, the incidence of relict boundaries was confirmed, especially between the liberal and progressive lands of the former Prussian partition and large urban agglomerations in the remaining partitions on the one hand, and the conservative-right part of the country within the Russian and Austrian partition on the other (Zarycki 2015). This is a result of differentiated urbanisation and infrastructural conditions, which form the material and functional basis for social and economic growth, as well as of divergent socio-cultural patterns established in relatively mobile communities of Western
Poland (due to the settlement of the regained territories) and less mobile communities of Eastern Poland (indigenous, with a high share of private property in agriculture). The GWR results confirm with high probability that the presence of local communities, e.g. national and religious minorities (the aforementioned Belarussian and Lithuanian minorities in Podlasie and Suwalszczyzna, or the German minority in Opole Silesia) may influence the local weakening of the explanatory power of the regression model. This is confirmed by the observations of J. Bański et al. (2009, p. 503), who claimed that the electoral behaviour of certain social groups in spatial terms may make it difficult to unambiguously assess the influence of particular factors (including historical and cultural ones) on political preferences.

The results confirm the incidence of strong correlations between the spatial diversity of the level of growth and the structure of political preferences, characterised by dangerous tendencies. They are related to the radicalization of the inhabitants of the economically weakest areas and their increased susceptibility to populist suggestions of conservative political groups, which is reflected in their electoral preferences. This takes the form of a symbolic opposition to the current situation, which Rodriguez-Pose (2017) calls a revenge of “places that don’t have a future” and which do not want to remain “places that don’t matter.” Residents of these areas expect the effective cohesion policy intervention. At present, the place-based policy is becoming more and more popular and its practice seems to be suitable for tearing these areas out of the "vicious circle" of marginalisation in which they fell as a consequence of applying the "one size fits all" approach. The adaptation of the nature and scope of interventions to local resources, needs and challenges, while taking full advantage of the subsidiarity principle, may bring the expected results. It can turn on these areas back into a network of socio-economic relations that provide sustainable growth and development (McCann, Varga, 2018).

**BIBLIOGRAPHY**


Jadam H., 1976, Pionierska społeczność w Bieszczadach, WSP, Rzeszów.


