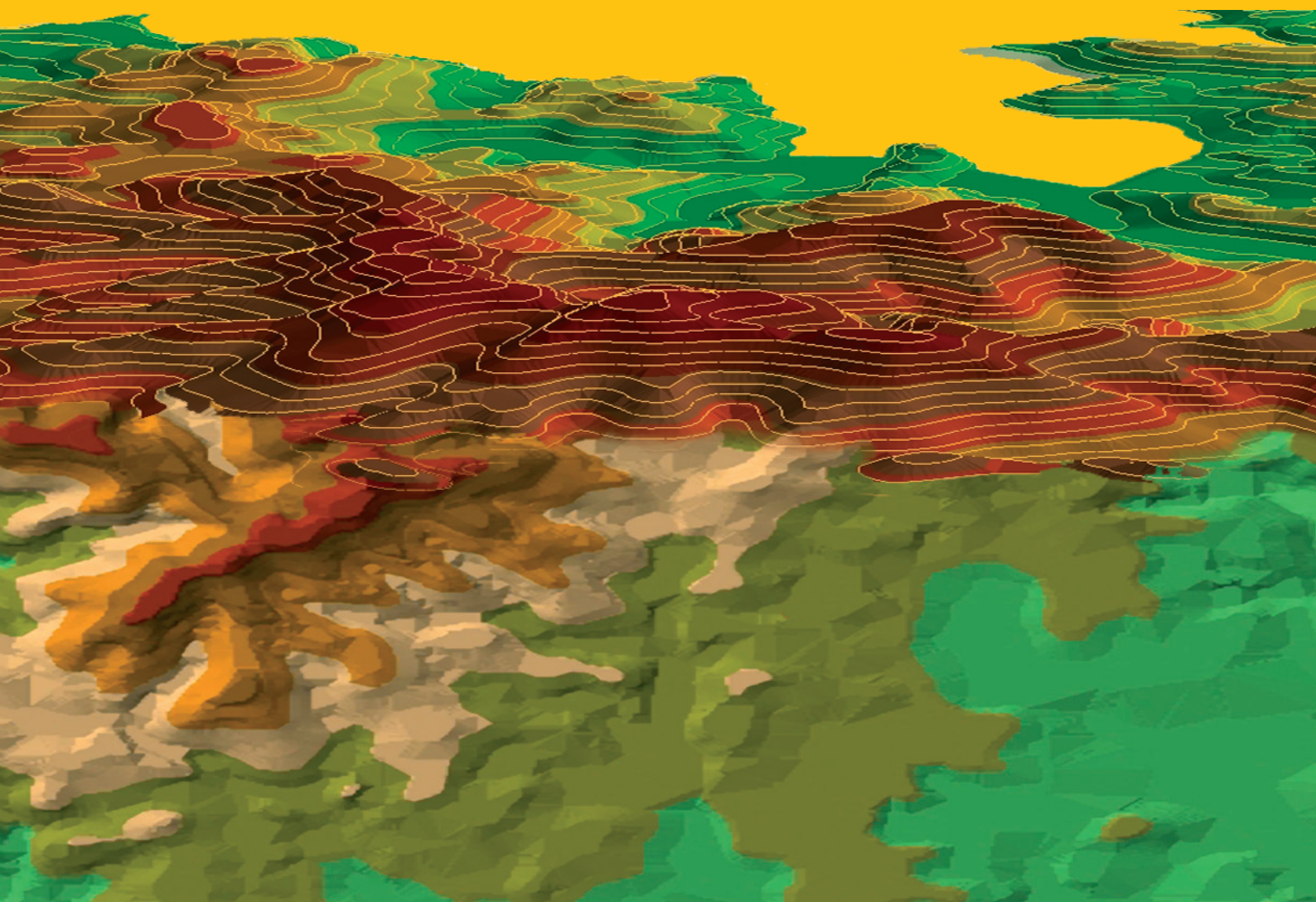


Vol. 31/2023

No. 3

# MORAVIAN GEOGRAPHICAL REPORTS



# MORAVIAN GEOGRAPHICAL REPORTS

## EDITORIAL BOARD

### **Editor-in-Chief**

**Bryn Greer-Wootten** (*York University, Toronto, Canada*)

### **Associate Editors**

**Bohumil Frantál** (*Institute of Geonics CAS, Brno, Czech Republic*)

**Pavel Klapka** (*Palacký University, Olomouc, Czech Republic*)

### **Technical & Marketing Editors**

**Tomáš Krejčí** (*Institute of Geonics CAS, Brno, Czech Republic*)

**Hana Doležalová** (*Institute of Geonics CAS, Brno, Czech Republic*)

**Jana Zapletalová** (*Institute of Geonics CAS, Brno, Czech Republic*)

### **Editorial Board**

**Marina Frolova** (*University of Granada, Granada, Spain*)

**Lucie Kubalíková** (*Institute of Geonics CAS, Brno, Czech Republic*)

**Josef Kunc** (*Masaryk University, Brno, Czech Republic*)

**Viktor Květoň** (*Charles University, Prague, Czech Republic*)

**Sebastian Lentz** (*Leibniz Institute for Regional Geography, Leipzig, Germany*)

**Jiří Malý** (*Masaryk University, Brno, Czech Republic*)

**Damian Maye** (*University of Gloucestershire, Cheltenham, UK*)

**Josef Navrátil** (*Nature Conservation Agency of the Czech Republic*)

**Martin J. Pasqualetti** (*Arizona State University, Tempe, USA*)

**Pavel Raška** (*Jan Evangelista Purkyně University, Ústí nad Labem, Czech Republic*)

**Michael Roth** (*Nürtingen-Geislingen University, Nürtingen, Germany*)

**Serge Schmitz** (*University of Liege, Liege, Belgium*)

**Miloslav Šerý** (*Palacký University, Olomouc, Czech Republic*)

**Michael Sofer** (*University Bar Ilan, Ramat-Gan, Israel*)

**Martin Šveda** (*Comenius University, Bratislava, Slovakia*)

**Kamila Svobodová** (*University of Göttingen, Göttingen, Germany*)

**Dan van der Horst** (*University of Edinburgh, Edinburgh, UK*)

**Maarten Wolsink** (*University of Amsterdam, Amsterdam, the Netherlands*)

# MORAVIAN GEOGRAPHICAL REPORTS

## Research articles:

- 120 | *Dominika STUDZIŇSKA*  
***Borderlands in times of crisis: The possibility of de-marginalisation of the Polish border zone with Russia after the outbreak of war in Ukraine***
- 129 | *Marek LICHTER, Jiří MALÝ*  
***Compact and polycentric urban forms as intertwined concepts: Learning from the impacts of Covid-19 retail restrictions on spatial (in)equalities in Brno (Czech Republic)***
- 141 | *Vladimír BALÁŽ, Ivan LICHNER, Tomáš JECK*  
***Geography of migration motives: Matching migration motives with socioeconomic data***
- 153 | *Dominik KEVICKÝ, Jonáš SUCHÁNEK*  
***Examining voter turnout using multiscale geographically weighted regression: The case of Slovakia***
- 165 | *Jerzy BAŇSKI, Damian MAZUREK*  
***Identification of the spatial extent of the peri-urban area: The case of three cities in Poland***

## Scientific communication:

- 174 | *Bohumil FRANTÁL, Stephan BARTKE, Justyna CHODKOWSKA-MISZCZUK, Oleg GOLUBCHIKOV, Bryn GREER-WOOTTEN, Pavel KLAPKA, Petr KLUSÁČEK, Robert KRZYSZTOFIK, Marián KULLA, Miroslava ONDRÁČKOVÁ, Martin J. PASQUALETTI, Dan VAN DER HORST*  
***In memory of Stanislav Martinát (1976–2023)***

---

## PUBLISHERS

The Czech Academy of Sciences, Institute of Geonics  
Department of Environmental Geography

Palacký University Olomouc, Faculty of Science  
Department of Geography

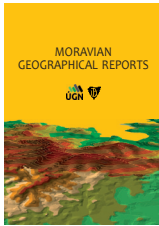
(e-mail) [mgr@ugn.cas.cz](mailto:mgr@ugn.cas.cz)  
(home page) <http://www.geonika.cz/mgr.html>

ISSN 2199-6202 (Online)

## ACCESS TO THIS JOURNAL

Information on the journal's aims and scope, instructions for authors, calls for special issues, and full contents are available free online at:

<http://www.geonika.cz/mgr.html>  
<https://content.sciendo.com/view/journals/mgr/mgr-overview.xml>



The Czech Academy of Sciences, Institute of Geonics  
 Palacký University Olomouc, Faculty of Science  
 journal homepage: [www.geonika.cz/mgr.html](http://www.geonika.cz/mgr.html)  
 doi: <https://doi.org/10.2478/mgr-2023-0011>

# Borderlands in times of crisis: The possibility of de-marginalisation of the Polish border zone with Russia after the outbreak of war in Ukraine

Dominika STUDZIŃSKA <sup>a\*</sup>

## Abstract

*The Polish-Russian border, closed since the outbreak of the Covid-19 pandemic, transformed into an iron curtain without any chance for its disappearance in a long-term perspective. The ongoing conflict between Russia and the EU started an experiment in the Polish zone bordering with Russia with respect to the planning of economic growth in the new reality – in a fully isolated area – where the border is a limitation and not an opportunity. According to the author's research, the crisis caused by the permanent closing of the Polish-Russian border and suspension of contacts with the Kaliningrad Oblast, which initially was a hard blow for the border communes, with a particularly difficult economic situation, may – in the long-term perspective – turn out to be an important driving force for changes. The primary purpose of this paper is to identify the main actions taken by the Polish local authorities at the border with Russia, the aim of which is revitalisation of the local economy after the Polish-Russian border was closed. The article is based on a number of in-depth expert interviews carried out in the Polish border area.*

**Keywords:** Polish border zone with Russia, re-bordering, war in Ukraine, de-marginalisation

**Article history:** Received 19 April 2023, Accepted 5 September 2023, Published 30 September 2023

## 1. Introduction

Recent events have once again assigned Poland's eastern borders with the role of providing security. For fear of loss of sovereignty, government authorities decided to seal the political borders and to increase their visibility by erecting walls and fences. The Russian aggression in Ukraine heightened the fears of European citizens for their own safety, forcing the domestic authorities to make the borderlands secure (cf. Opiola et al., 2022).

The example of the Polish-Russian border ideally fits the new border trends. The construction of a temporary barrier, preceded by sealing the border in the institutional and legal dimensions, changed the daily life of the local communities at the Polish-Russian borderland. In spite of the fact that since the moment of its delimitation the border has been characterised by unique dynamics in the degree of its permeability, until the beginning of the war in Ukraine in 2022 it had served as an important incentive for local and regional development. Volatility, which is the immanent feature of the Polish-Russian border, had been to a certain degree domesticated by the local actors from the borderland. As noted by Komornicki, Wiśniewski and Mischczuk (2019, 480), the region worked out an ability to derive benefits from the vicinity of a hard and weakly permeable border. At moments of an increased degree of permeability, the residents and the local authorities from the Polish zone bordering with Russia

used it to improve the difficult economic situation of the region. In turn, at times when it was sealed, they simply waited. Use of the border as a development incentive – emerging at moments of exogenous shock, caused by positive relations on the level of central authorities – was considered the only possibility of counteracting the progressing peripherisation (cf. Łukowski, Bojar & Jałowicki, 2009; Studzińska, 2021).

The reality of the Polish-Russian borderland, closed since the outbreak of the Covid 19 pandemic, changed in spite of the claims of Lara-Valencia and Laine (2022, 10), who believe that a full isolation of borderlands is impossible. The example of the Polish-Russian borderland, on account of its strong exposure to geopolitical risk, must be treated as a special case in border studies. The military and symbolic role of the Kaliningrad Oblast for the Russian Federation results in the attention of the Kremlin being strongly focused on the policy of the region's securitisation (Vendinaa et al., 2021). In turn, according to Bieleń (2019), the policy of the Polish government with respect to Russia is dominated by the fear of Russia and acting to the detriment of their own interest. The extraordinary role attributed to the Polish-Russian borderland in the context of European security entails that any type of mutiny of the residents of the Polish zone bordering with Russia at the moment of sealing of the border would stand in opposition to the general interest of the residents of Europe. Hence, the local

<sup>a</sup> Department of Socio-Economic Geography, Faculty of Social Sciences, University of Gdańsk, Poland (\*corresponding author: D. Studzińska; e-mail: [dominika.studzinska@ug.edu.pl](mailto:dominika.studzinska@ug.edu.pl))

community experiences the prevalence of security over the welfare of the local economy. The Polish-Russian borderland is a good example of “coexistent” border areas (Martinez, 1994). As suggested by Prokkoła (2022, 26), ‘from the resilience point of view, this means that if a border community faces a sudden stress event and disruption, they must mainly rely on local capacities and domestic institutions’. The primary purpose of this paper is to identify the main actions taken by the Polish local governments at the border with Russia, the aim of which is revitalisation of the local economy after the Polish-Russian border was closed. In her discussion, the author attempts to answer three key research questions:

1. Is the development of peripheral border areas possible without using the border as a resource?
2. How do the local governments of border communes handle the new reality created by the Russian and Ukrainian conflict?

3. Are the actions taken by local governments contributing to the improvement of the economic situation of the analysed communes?

Furthermore, the author tries to show that the crisis situation experienced by the Polish local governments in relation to the Russian invasion of Ukraine may become a strong development incentive for communes with a strong exposure to geopolitical risk. The study encompasses communes that belong to the Association of Warmian-Masurian Border Communes (Stowarzyszenie Warmińsko-Mazurskich Samorządów Pogranicza) (Figs. 1 and 2). Reference books offer a broad array of modes of delimiting border areas based on the administrative criterion or distance from the border (*cf.* Sitek, 2016; Komornicki, Wiśniewski & Mischczuk, 2019). Nevertheless, the grass-roots initiatives of local authorities as part of the Association motivated the author to take up field studies.



Fig. 1: The Association of Warmian-Masurian Border Communes  
Source: authors' elaboration

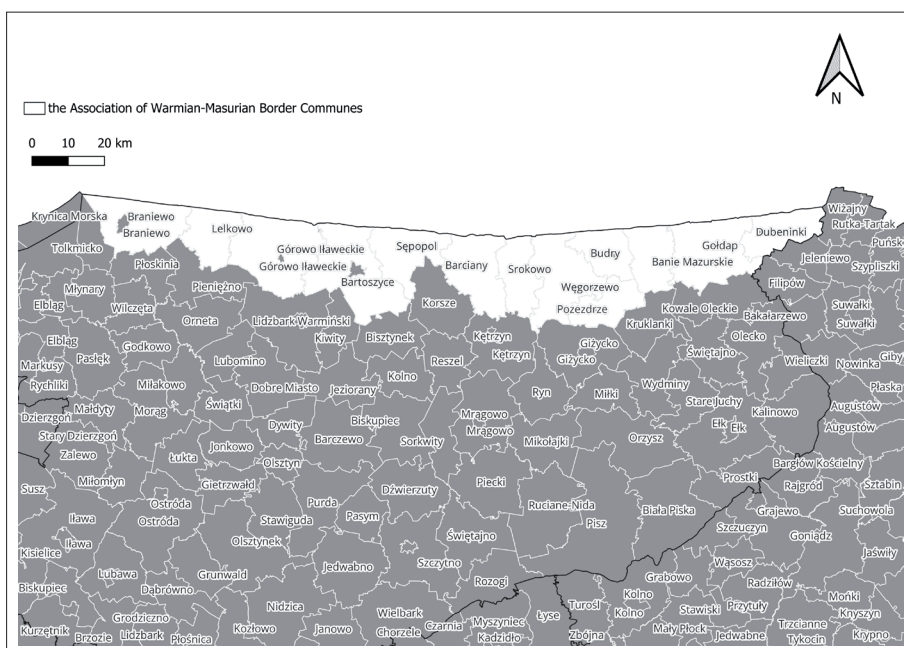


Fig. 2: The Association of Warmian-Masurian Border Communes  
Source: authors' elaboration

The paper is merely an introduction to the discussion, and aims to encourage further studies on the future fate of the Polish zone bordering with Russia. The actions presented in the paper – given their initial level – require more comprehensive analyses. In turn, the formulated conclusions must be verified. The author's intention is to draw the border researchers' attention to the present situation of this region, unique in the scale of Europe, so that in the long-term perspective scientists representing various academic fields may observe and assess better the possibility of the de-marginalisation of fully isolated border regions.

## 2. Theoretical background

In compliance with the general overview of literature, border regions are relatively often identified as peripheries (e.g. Zarycki, 2011; Böhm & Drápela, 2017; Komornicki, Wiśniewski & Mischuk, 2019; Leutloff-Grandits, 2022). As noted by Deleixhe, Dembinska and Iglesias (2019), the peripherality of border regions is not only an outcome of their geographic distance from the centre, but also of the burden of their institutional distance with respect to the central authorities. These areas are usually economically weaker and have a less developed infrastructure, as compared to the regions located in the central part of the state (Böhm & Drápela, 2017). Given their economic and geographic distance from the economic centres, they are called 'double peripheries' and even 'double peripheral dead ends' (cf. Leutloff-Grandits, 2022; Paül et al., 2022).

However, it cannot be concluded that peripherality is the immanent feature of border regions. Examples of European regions located along internal borders of the European Union prove that borderlands may build their competitive advantage based on the resource of the state border (cf. Sohn, 2014). Durand, Decoville and Knippschild (2020) claim that these regions, on account of their socio-economic links, are good examples of spaces to 'check the pulse' of the level of European integration. Nevertheless, Prokkola (2022, 31) notes that 'the difference between the EU internal and external border regions underscores the difference that the geopolitical environment makes from the viewpoints of resilience'.

The level of border use by the border regions was particularly visible at the moment of their global revival when the fears of the spreading of the SARS-CoV-2 virus were running high. According to Opiłowska (2021, 597), this has clearly shown 'how closely connected the border regions are and how the trans-national border spaces have changed.' This isolation – even though temporary – immediately increased the peripherality of border regions (Rosik et al., 2022). It follows from the literature review that assigning the role of a barrier to the border regions was particularly poignant for the borderland residents (Klatt, 2020; Kajta & Opiłowska, 2021; Opiłowska, 2021; Opiola & Böhm, 2022; Lara-Valencia & Laine, 2022; Paül et al., 2022). Medeiros et al. (2021), wishing to highlight the negative consequences of the sudden and clear reinstatement of borders, described the actions of central authorities as Covid-fencing, thus comparing the global isolation of borderlands to the physical erection of border walls. According to Radil, Pinos and Ptak (2021, 134), border closing as a consequence of the Covid-19 pandemic was a clear example that borders in crisis situations are reinstated as an important tool used to defend from the 'enemy' and that this tool is applied equally willingly by both authoritarian and democratic states.

Acceptance for 'hardening' the political borders should be an important clue for the borderland actors that in crisis moments believe their daily reality is particularly at risk and depends exclusively on grass-roots initiatives (cf. Böhm, 2021; Kajta & Opiłowska, 2021; Opiłowska, 2021). Experiences gathered by the representatives of local and regional levels of borderland administration during the time of Covid-19 constitute an

important basis for their activities in the nearest future (Opiola & Böhm, 2022). First of all, the unilateral and top-down decision on border closing, without taking into account the cross-border nature of European borderlands (Böhm, 2021), has shown that 'nation-states continue to play the decisive role in transborder relations, leaving subnational actors dependent on central decisions' (Kajta & Opiłowska, 2021, 2). The fact that consultations with borderland authorities were overlooked should be an important guideline for the local leaders for building a dialogue with the central authorities in the future. Jańczak (2020) even suggests that the sub-state authorities should be in ongoing contact with the government and remind it about the significance of cooperation for the cross-border regions. Secondly, borderlands around the world, even though only for a moment, experienced a great experiment in the form of resistance to crisis situations and a search for new solutions to continue actions in border areas. Studies carried out by Kajta and Opiłowska (2021, 20) proved that the critical situation of the border regions has created new trajectories of trans-national cooperation. All actions taken at the governmental level have solidified the conviction of the local governments at the borderlands that the situation of the border regions fully depends on their creativity.

Even though re-bordering is not a new phenomenon, it seems to take root in Europe more and more. As suggested by Opiola et al. (2022, 19), 'for a long time, the Europeans have not been so worried by their future as they are now due to what is going on with the borders and around them.' The war in Ukraine has challenged the post-Cold-war order in Europe (Freudspurger & Schimmelfennig, 2022). 'In Finland, the events caused a "seismic shift" in the mode of looking at Russia and the Finish and Russian border' (Prokkola & Ridanpää, 2022, 1). As follows from the Eurobarometer survey (2022), over 40% of respondents in Poland, Czech Republic, Lithuania, Finland and Estonia believe that the defence policy of the EU, including the defence of external borders, should be a priority, and that the European Parliament should address it in the first place. The geographic proximity of Russia caused panic among residents of Europe and a desire to reinforce the defence function of borders. In response to the citizens' expectations, Finland is implementing a pilot project of erecting a 200 km fence at the Finnish-Russian border (BBC, 2023). Poland is placing anti-tank barricades at the border with Russia and Belarus. Furthermore, it is sealing the Polish-Russian border by building a temporary wall (The Defense Post, 2023). Europe is clearly aiming for a separation of Russia and Belarus from the remaining part of the continent, implementing the project of a European 'curtain made of barbed wire' (Washington Post, 2023).

Are these activities a just direction that will improve Europe's security, or only an expression of a certain helplessness of the central authorities with respect to the next crisis situations? There is no straightforward answer to this question. The researchers claim that increasing a country's defence systems by erecting walls and barbed wires is a highly ineffective action (cf. Nail, 2013; Deleixhe, Dembinska & Iglesias, 2019; Opiola et al., 2022). According to Paasi (2022, 18), the ongoing construction of border fences is nothing else but a production of 'theatrical performances' for the distressed nations. However, it goes without doubt that the hardening of borders is strongly affecting the border regions, increasing the number of double peripheral dead ends. State authorities seem to forget that a border is a multi-functional institution used by the communities at various levels of spatial aggregation. That is why the demonstration of power through the process of re-bordering in Europe should be accompanied by specific national and EU policies addressed to areas located in the shadow of the more and more solid borders. As suggested by Prokkola (2022, 31) 'the borderland's resilience has its own logic that is interconnected yet simultaneously different from the national and European Union political agendas'.

### 3. Methods and data

The paper was prepared based on the results of field studies carried out in the period between July and December 2022. The research material was gathered during nine study visits to the Polish border zone. In the course of the research, nineteen in-depth expert interviews were completed. The interviews were carried out with mayors and heads of border communes (in special cases, interviews were held also with their deputies). All the interviews were recorded and transcribed. The local authorities were asked about:

1. The main social and economic problems of the border communes,
2. Impact of the war in Ukraine on the economic situation of the communes, and
3. Activities for the sake of de-marginalisation.

The key issue addressed in the course of the studies were benefits resulting from membership in the newly-established Association of Warmian-Masurian Border Communes. In total,

fifteen interviews were held. To expand the research perspective, the author included in the interviews experts on the local and regional development of border areas and journalists representing newspapers with regional and national coverage, specialising in issues pertaining to the Polish-Russian borderland. The interviews were conducted in Polish and translated into English. The respondents' data were anonymised and coded (Tab. 1). The entire study was supplemented with an analysis of the territorial strategy of the Association of Warmian-Masurian Border Communes, which forms a consistent vision of border communes for the future of the region. The strategy was developed in January–September 2021 in cooperation with the advisors. Association of Polish Cities and members of the Association of Warmian-Masurian Border Communes. Although the strategy was created before the Russian invasion, its authors – taking into account the changing geopolitical situation and its impact on the region – have prepared solutions that can be developed in the border area even in the event of a closed border.

Interview code	Type of expert	Date of interview
W01	local authority, rural commune, man	12 July 2022
W02	local authority, rural commune, woman	7 July 2022
W03	local authority, town; man	19 September 2022
W04	local authority, rural commune, man	17 August 2022
W05	local authority, rural commune, man	12 July 2022
W06	local authority, rural commune, woman	14 September 2022
W07	local authority, rural commune, man	12 July 2022
W08	local authority, rural commune, woman	17 August 2022
W09	local authority, rural commune, man	26 August 2022
W10	local authority, town; man	30 August 2022
W11	local authority, rural commune, man	7 July 2022
W12	local authority, town; man	7 July 2022
W13	local authority, town; woman	7 July 2022
W14	local authority, rural commune, man	2 December 2022
W15	local authority, town, man	2 December 2022
E01	expert in regional and local development, man	30 October 2022
E02	expert in regional and local development, man	2 September 2022
D01	journalist, woman	16 September 2022
D02	journalist, man	8 December 2022

Tab. 1: The list of interviewers Source: Own elaboration

## 4. Results: the Polish border area with Russia in the era of crisis

### 4.1 The new reality of the Polish border area with Russia after Russia's invasion of Ukraine in the opinion of the local authorities

Independently from the modes of delimiting problem areas, the Polish border zone with Russia in the majority of studies is listed as an area at risk of permanent marginalisation (cf. Śleszyński et al., 2017; Komornicki, Wiśniewski & Miszczuk, 2019; Śleszyński, Herbst & Komornicki, 2020). In line with the conclusions formulated by Komornicki, Wiśniewski and Miszczuk (2019), the Polish-Russian border is a border of significant 'disadvantages', where all the border units require potential developmental support. The 2030 Borderland Strategy (Strategia Pogranicza 2030, 2021, 15) clearly stresses that the 'practically closed Polish-Russian border is a key factor for socio-economic peripherisation of the borderland, leading to its relative impoverishment, human drain and weakening of the bases of its further development.' According to local authorities, this region is characterised by progressing depopulation, ageing of the society and a difficult

economic situation, which makes it an area of low attractiveness with respect to settlement and investments [W02; W09; W10; W11]. The 2030 Strategy of the Warmian-Masurian Province (2022) indicates that communes located at the border with Russia are characterised by a low index of entrepreneurship. Furthermore, rural areas with a low level of living conditions are concentrated along the border with the Kaliningrad Oblast.<sup>1</sup>

For a number of years, the difficult situation in the region had been mitigated by attempts at using the Polish-Russian border as an important development incentive (cf. Łukowski, Bojar & Jałowicki, 2009; Studzińska, 2021). In periods of an increased degree of border permeability, the Polish border zone benefitted from the development of trade and tourism in the region, implementing numerous investments addressed to clients from the Kaliningrad Oblast. As noted by one of the mayors [W12],

'the tourist traffic relied on traffic with Russia. Major tourist centres – for example Goldap – addressed their offer to Russian tourists. The stream of Russian tourists was flowing fast. Many affluent tourists came from Kaliningrad.'

The four-year period of the local border traffic led to the revival of the borderland (cf. Sagan et al., 2018). Thus, some borderland

<sup>1</sup> The author, intending to assess the actions aimed at counteracting the progressing marginalisation, purposefully did not perform a detailed analysis of the socio-economic situation. Such assessment is available in the strategic documents (among others, the 2030 Borderland Strategy, the 2030 Development Strategy of the Warmian-Masurian Province) and in reference books (among others, Śleszyński, Herbst & Komornicki, 2020). The author's intention is to identify the main development problems, aggravated in relation to the conflict situation in Europe, and the modes of solving them.

actors forgot about the military role of the Kaliningrad Oblast and strong dependence between the degree of border permeability and the geo-political determinants. The subsequent events leading to stronger and stronger hardening of the Polish-Russian border proved that the expectations of the local authorities and residents with respect to the use of the benefit of their border location were too high.

Gradual sealing of the Polish-Russian border since the suspension of the local border traffic thwarted the cross-border activity until its total elimination at the moment of the outbreak of the Covid-19 pandemic and subsequently Russia's invasion of Ukraine. The new borderland reality challenged the possibility of further use of the border and set new challenges before the local and regional authorities. As noted by one commune head [W08],

'we were friends with our neighbours, with the Zheleznodorozhny Commune and the Pravdinsky District. They were our friends, we visited each other. As part of the Association, we even filed one joint application [to procure EU funds – author's note]. I talked to the province governor about opening the border crossing point in the commune, but the war stopped it all.'

'Before the closing of the border, the residents maintained social, trade, service and economic contacts with the Russians. Today, we have some kind of paralysis in the town' [W03].

According to the studies carried out by Statistics Poland (2023), the expenses incurred by foreigners crossing the Polish-Russian border in the third quarter of 2022 as compared to the analogous period of 2019 dropped by 85.5%.<sup>2</sup> As noted by one respondent [W04],

'suspension of the local border traffic extinguished the service market, but now with the war, everything got worse [...] We had a million potential clients and now we have a wall.'

As follows from the statistical information provided by the Border Guards (2023), approx. 370,000 crossings were recorded at the Polish-Russian border in 2022, which is only 6% of the border traffic recorded at the Polish-Russian border in 2014 (Fig. 3).

The overall climate of the Russia and EU conflict not only hindered the cross-border activity of the residents of the Polish-Russian borderland, but also put an end to the cross-border cooperation. As noted by Bartnik and Bielewski (2022, 36), the Russian aggression against Ukraine immediately led to

the termination of multilateral and bilateral contracts with the Kaliningrad Region. The Baltic Euroregion decided to suspend the membership of the Kaliningrad Oblast. The Warmian-Masurian Province terminated the cooperation agreement signed with the Kaliningrad Oblast in 2001. The border communes cancelled the bilateral agreements. Even though for many local authorities the decision to freeze the cooperation – an expression of solidarity with Ukraine – was the only right solution at the time of the ongoing conflict [W02, W09 and W13], it must also be said that it postponed their development prospects. As noted by one representative of the local authorities [W03],

'I have been working for the local government for 10 years and since the first days of my work we established and maintained friendly contacts with the representative of the Kaliningrad Oblast authorities [...]. Today, slightly under the pressure of the media, but also our own logic, we had not only to freeze these contacts, but also terminate them. I did it with a painful heart [...]. Suspending all relations changed the mode of functioning of the local government. At this moment, we do not speak about partnership with the neighbours, but we are looking for partners in different places in Poland and Europe.'

The local authorities not only lost the opportunity of pursuing joint measures as part of bilateral contracts, but were also forced to continue on their own the projects started with the Russian partner as part of the 2014–2020 Poland-Russia Cross-Border Cooperation Programme. Furthermore, in line with the decision of the European Commission, the Polish and Russian cooperation for the new financing period of 2021–2027 was suspended (Bartnik & Bielawski, 2022). The end of cooperation of the Polish border communes with the Kaliningrad Oblast is a development problem for many local governments. One respondent [W12] comments that as follows:

'Our situation after closing the border is even worse than before [...]. The whole system relied on cooperation with Russia. The bubble burst. The funds [from the suspended Poland-Russia Programme – author's note] should be assigned to the assistance for the north-eastern wall, so that we could start re-building our infrastructure in separation from the Kaliningrad Oblast. For years, this infrastructure was built with the thought about clients from Russia. Now everything has disappeared. A bad after-taste remains. What is more, additional support is needed.'

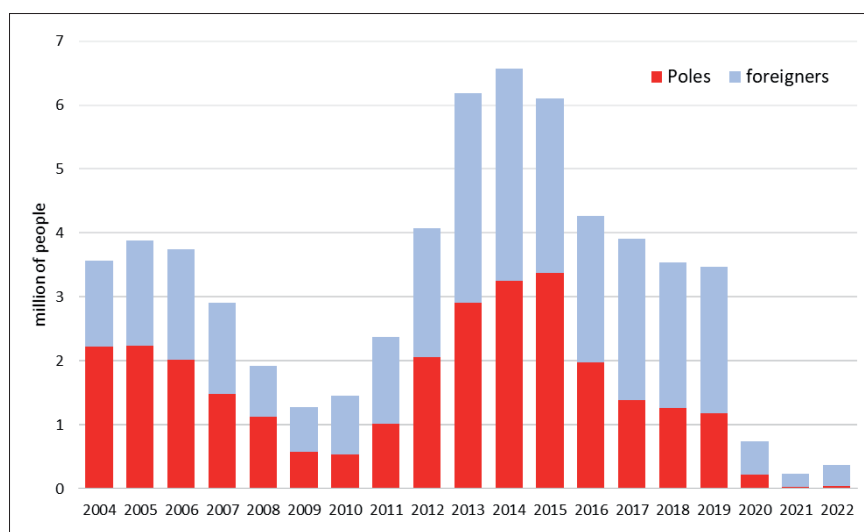


Fig. 3: Cross-border traffic in the Polish-Russian border area 2004–2022

Source: authors' elaboration based on Border Guard 2023

<sup>2</sup> In line with the information provided by Statistics Poland (2023), the citizens of the Russian Federation are dominant among foreigners crossing the Polish-Russian border.



The territorial government sees the relocation of funds from other programmes, among others the Poland-Lithuania Programme, as an opportunity, and takes specific steps in this respect.

‘We requested the Marshal and the Minister to start negotiations on re-assigning the funds from the Poland-Lithuania Programme for the support of the border areas with Russia. So far, we have not been successful. Yet we are hoping that at least some of the funds will be reassigned to us. We are doing all we can. We know that it is a great opportunity for us so we are fighting’ [W11].

On 10 March 2023, the Joint Monitoring Committee for the Poland-Russia Programme decided to transfer only the additional funds – recovered from the Russian partners – to the Polish beneficiaries implementing the projects as part of the 2014–2020 financing period (PLRU, 2023). This decision does not offer any opportunities for procuring funds for new projects. Due to this, the solution does not respond to the needs of the Polish zone at the border with Russia.

#### **4.2 An attempt to de-marginalise the Polish border area and its effectiveness**

The studies performed by the author show that the Russian aggression in Ukraine increased the difficult socio-economic situation in the region. One of the development opportunities is the use of the potential of the Association of Warmian-Masurian Border Communes, set up in 2019. In spite of the fact that the idea for setting up the Association appeared even before the outbreak of the war in Ukraine in 2022, it must be stated that its role in the process of de-marginalisation of the region may be essential. According to the information provided by the local authorities, the idea for setting up the Association was sparked by joint challenges in the socio-economic area. The Association, thanks to the support of external experts as part of the Advisory Support Centre project (Centrum Wspierania Doradczego) (financed by the EU), embarked on the path of strategic planning of the development of the Polish border zone with Russia (Report of the Advisory Support Centre..., 2022). As noted by one commune head [W06],

‘the most important is the fact that the association exists and brings together representatives of units that are similar.’

In addition, another respondent [W11] stated,

‘We are all border communes. This affects, among others, limitations in the development of communication. Nobody wants to invest in roads that lead to the border where you have to turn and go back to the centre of Poland. We have set up the association, we started to look for solutions and to prepare a joint strategy, the Advisory Support Centre has appeared and everything went smoothly.’

Without doubt, the mere establishment of the Association should be assessed as a manifestation of a certain maturity and growing awareness that acting together in a partnership offers a significant opportunity for ‘saving’ the region from permanent de-population. The representatives of the local authorities did not hide the fact that they see their membership in the Association as an opportunity to source external funding, as confirmed by the deputy mayor of one commune [W010],

‘we are a local government with slight own revenues and that is why we are trying to participate in initiatives thanks to which it is possible to seek financing for investments constituting the ‘backbone’ of the operation of a commune. Here, I have the infrastructural investments in mind.’

It is worth stressing that these individual motives may in the future bear fruit in the form of a change of thinking about management.

Membership in the Association has opened new opportunities for the local governments. Apart from a chance to seek external funds, the local governments created a space for the exchange of thoughts and experiences. This practice, even though applied by the local governments very often, is a certain novelty in building the competitive advantage for the local governments from the Polish zone bordering with Russia. As noted by a respondent [W01],

‘a definite majority of communes located along the border expressed willingness to join the Association. We also did not want to remain outside of it. We were intent on it so that at least the thought about development is transferred from one commune to another.’

An important benefit from acting together is an increased power of their voice. The local authorities are aware that they represent an area with a low population density, located in a peripheral part of the country. Thus, they are aware that their agency increases when they act jointly for the region, as confirmed by the respondents’ answers.

‘We would like to show our problems with greater force’ [W07].  
‘The more of us, the stronger our voice would be. We would like our Association to become known in Poland. We would like the borderland to be united [...]. Our actions are intended to promote this area and to make life here attractive’ [W02].

Promotion of the region and building a strong, recognisable brand are some of the major activities taken up by the local governments as part of the Association. However, building the brand requires not only time, but primarily specific changes for the sake of improving the current situation of the region. Promoting the region as part of a planned experiment of unconditional basic income as a tool limiting poverty and economic inequalities has turned out a strategic marketing measure.<sup>3</sup> As noted by one expert [E02],

‘the number of press articles about the borderland from May to June 2022 was higher than in the last ten years. Poles, not living in the region started to recognise the place. It was because of the project of unconditional income for the borderland.’

The initiative of launching the pilot project met with a considerable interest of the domestic media, but also the residents of the borderland. As noted by a representative of local government [W01],

‘the Association has promoted itself wonderfully, congratulations. The idea is interesting. Our residents asked straightforwardly what criteria had to be fulfilled and who would receive the money. I am waiting with bated breath for the commencement of the project.’

The optimism of representatives of local governments with respect to the possibility of sourcing funds for project implementation and its efficiency in the process of counteracting social inequalities is moderate. Nevertheless, the example confirms that the local governments are ready to use the new tools of local development. As concluded by one expert [E02],

‘there is openness to various experiments [...]. There is a desire for change.’

The local decision makers became aware that the special location of the area requires the preparation of projects adjusted to the specific nature of the area. Development of qualified tourism and eco-tourism, attracting seniors to the enclave of silver tourism, along with an attempt at setting up the mobile People’s University of the Borderland (Uniwersytet Ludowy Pogranicza), are only some of the ideas for reviving the Polish border zone (Strategia Pogranicza 2030, 2021).

<sup>3</sup> As part of the project, a selected group of residents (from 5,000 to 31,000) – based on previously specified criteria – would receive the amount of PLN 1,300 for two years (Strategia Pogranicza 2030, 2021).

The next activity increasing chances for success is the selection of a leader. In the opinion of Gorzelak and Jałowicki (2014), the local leaders are the most important factor of local success. As noted by one expert [E01],

‘we miss leaders here. This is the problem of these partnerships – if there is no natural-born leader, then this is a very slow process.’

Lack of a strong leadership is one of the key problems of the Polish zone bordering with Russia, which needs competent persons to represent the border zone on the regional, national and international level. Performance of multiple development plans requires external support. The future of this area depends on (1) the inventiveness and experiences of local leaders, (2) dialogue between borderland actors with central and EU authorities and (3) building mutual trust (Fig. 4). As noted by an expert [E02],

‘it is possible that the borderland already has an idea for itself, but the region and the government does not have any ideas for this area. And without it, nothing will change. In other countries, areas with such low population density have different tools that guarantee transportation, or atypical solutions in schools. I am observing the borderland and there is no possibility of testing an inter-commune school there.’

In line with an opinion of a development expert [E01], the key to success is

‘to say out loud that we need different thinking about the borderland in the dimension of regional and national politics. Not only the national programmes.’

#### 4.3 Development of the Polish border area in the shadow of the closed border

The analyses performed for this paper show that in order to accomplish the development goals, the borderland needs a number of changes. Apart from initiated actions, the key factor necessary to accomplish success in the long-term perspective is to turn away from the border permanently and to see it exclusively through the prism of an additional development incentive. One expert claims [E02],

‘you have to stop thinking that the border may become an impulse for development [...]. The strategy should rely on the fact that no impulse for development comes from there, for any reason. We have to build the future with such awareness.’

This statement was confirmed by another respondent [E01] who suggests that

‘you have to stop thinking about doing something with Russia. No, there is nothing like this now. Now is the moment that we

have to focus on looking for something different, on building some competitive edge’.

The actors of the Polish border find it hard to immediately change their thinking about the border.

‘Here, everything was related to the border,’

concluded a respondent [W04]. For many locals, it still represents some potential (even though temporarily extinguished) source of income. It is worth stressing that one of the major postulates of the organisation was to reactivate the local border traffic and increase the openness of the Polish-Russian border (Strategia Pogranicza 2030, 2021). Without doubt, the present situation in Europe – caused by the Russian aggression against Ukraine – has completely changed the potential resources that could be used by the Polish border zone. The local actors are slowly realising that they have to stop thinking about the border in the category of a development determinant.

‘The events in Ukraine have shown that we have to rebuild our thinking and look for other solutions,’

suggests one commune head [W11].

The local governments from the borderland have received a unique opportunity to work out new development trajectories. As justly noted by one expert [E02],

‘it is very hard to introduce changes when you are struggling not to drown.’

Nevertheless, the socio-economic situation of the Polish zone bordering with Russia is so difficult that it is worth treating the current crisis situation as a driving force for changes. Yet will the local governments take the risk and follow the more difficult, but also more effective path? Or will they choose the easier, but less stable path, abandoning the selected direction at the moment when the border opens? This scenario is difficult to foresee and depends on multiple determinants. The most significant factor conditioning the permanent de-marginalisation of the zone – in contrast to the general beliefs of local actors – is the permanent sealing of the border. The longer the border remains a non-accessible resource, the more local authorities will have to start the process of planning the commune’s development based on other potential. Furthermore, important factors preventing marginalisation include:

1. The immediate selection of a leader,
2. Sourcing external funding for performance of at least one project, and
3. Continued cooperation with external experts.

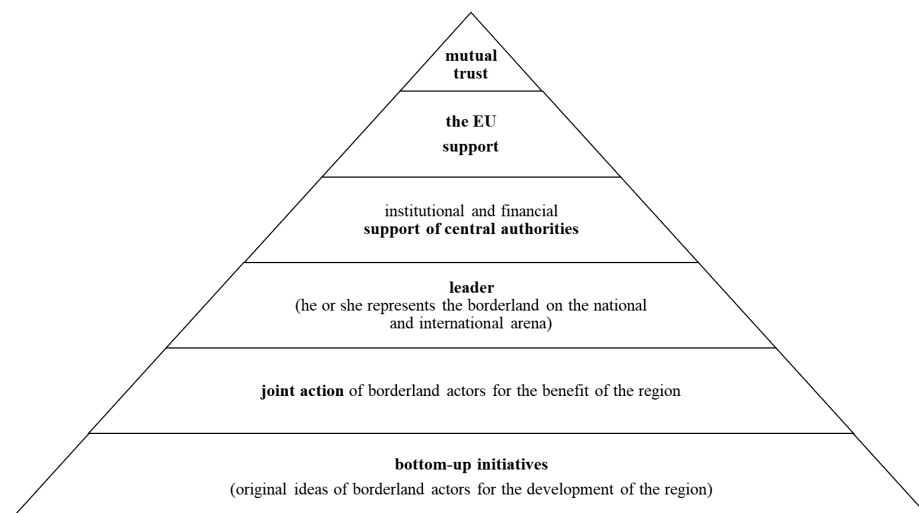


Fig. 4: The main determinants of development of Polish border area with Russia  
Source: authors' elaboration

In line with the opinion of borderland experts, the region needs joint benefits which will drive the cooperation. The local borderland actors need a materialisation of specific ideas. The eagerness that characterises individual actors cannot subside, because it forms one of the major success factors. It must be borne in mind that the border – at the moment of its re-opening – will be an attractive factor of local development, yet the completed studies show that the local governments should not abandon the path that they have chosen. Otherwise, the budding ‘borderland phenomenon’ will share the fate of other isolated border regions (cf. Leutloff-Grandits, 2022).

## 5. Discussion and conclusions

Russia’s military attack on Ukraine assigned the eastern border of the European Union with the role of a barrier, not only in the formal and legal dimension, but also the physical one. Permanent fencing off of the European Union states from Russia and Belarus proves that the changing relations between the European Union and Russia has transitioned into the era of ‘permanent freezing’ (cf. Nitoiu, 2017; Dembińska, Mérand & Shtaltovna, 2020). The overall climate of the conflict in Europe has intensified the peripheral nature of some border regions. The borderlands that are in the shadow of the hardened border face new challenges. Even though the borderland researchers have claimed that closed borders are in contradiction to the interests of border regions (Lara-Valencia & Laine, 2022; Richardson & Cappellano, 2022; Leutloff-Grandits, 2022; Opiłowska & Kajta, 2022), yet the studies performed for the purpose of this paper show that some borderlands – on account of their key significance in the context of Europe’s security – cannot counteract the progressing peripherisation by making use of the potential embedded in the political border. This resource is characterised by limited availability.

In relation to this, should regions of this type use the border only in the moments of its increased degree of permeability? Or should the local actors find their own paths of development and make use of different resources of local growth? The example of the Polish border zone shows that the attempts at counteracting marginalisation based on the benefit of the borderland location have ultimately ended in failure. The temptation to use the border as a resource resurfaced a number of times at moments when the relations between Russia and the EU and Poland were friendly. In this way, it prevented the local governments from planning long-term economic growth, not based on exogenous shock, but on endogenous potential.

In the author’s opinion, the crisis caused by the permanent closing of the Polish-Russian border and suspension of contacts with the Kaliningrad Oblast, which initially was a hard blow for the bordering communes, with a particularly difficult economic situation, may – in the long-term perspective – turn out to be an important driving force for changes. Effort put into the preparation of specific projects, forming a solid base for further actions, may turn out to be the only just development alternative. Actions taken by the local authorities of the Polish border zone after the military attack of Russia show that the growth of border regions in the difficult reality of the sealed border is possible.

The attempt at leaving the ‘*cul-de-sac*’ of the Polish border zone with Russia fully depends on bold decisions of local authorities, but also the support of regional, national and European authorities. The role of political decision-makers in the process of rebuilding not only the Polish zone bordering Russia, but all border regions which are the peripheries of the peripheries, is crucial. As follows from the performed studies, the key to success is to act jointly, not only as far as the local governments are concerned, but also in their dialogue with the government. A significant factor in the process of preventing marginalisation

is understanding the special situation of this area by the top ranks of the public administration and addressing specific, earmarked support here.

The performed analyses lead to the conclusion that the attempts at creating an attractive border region, made by the local authorities of the Polish zone bordering with Russia, are possible. Nevertheless, the road to reduce de-population and permanent marginalisation of the region will not be easy. It will require the perseverance of the local actors, ongoing dialogue with central authorities, external support and systematically monitored efficiency of the performed actions.

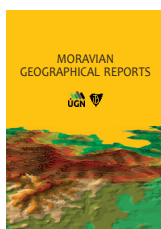
## References:

- Bartnik, K., & Bielewski, Ł. (2022). The Poland-Russia CBC: Great legacy, uncertain future. *Baltic Rim Economies* 3, 36.
- BBC (2023). Finland starts construction of Russia border fence. <https://www.bbc.com/news/world-europe-64802457>
- Bieleń, S. (2019). *Polityka wschodnia Polski – między fatalizmem geopolitycznym a klątwą niemocy*. Oficyna Wydawnicza ASPRA-JR.
- Böhm, H. (2021). Five Roles of Cross-border Cooperation Against Rebordering. *Journal of Borderlands Studies*, 1–20. <https://doi.org/10.1080/08865655.2021.1948900>
- Böhm, H., & Drápela, E. (2017). Cross-border cooperation as a reconciliation tool: Example from the East Czech–Polish borders. *Regional and Federal Studies*, 27(3), 305–319. <https://doi.org/10.1080/13597566.2017.1350650>
- Border Area Territorial Strategy 2030 (2021). *Stowarzyszenie Warmińsko-Mazurskich Gmin Pogranicza*.
- Border Guard (2023). *Statistics*. <https://strazgraniczna.pl/pl/granica/statystyki-sg/2206,Statystyki-SG.html>
- Deleixhe, M., Dembinska, M., & Iglesias, J. (2019). Securitized Borderlands. *Journal of Borderlands Studies* 34 (5), 639–647. <https://doi.org/10.1080/08865655.2018.1445547>
- Dembińska, M., Mérand F., & Shtaltovna. A., (2020). Conflict and cooperation between Europe and Russia: the autonomy of the local. *East European Politics* 36(4), 477–498. <https://doi.org/10.1080/21599165.2020.1784145>
- Durand, F., Decoville, A., & Knippschild, R. (2020). Everything All Right at the Internal EU Borders? The Ambivalent Effects of Cross-Border Integration and the Rise of Euroscepticism. *Geopolitics*, 25(3), 587–608. <https://doi.org/10.1080/14650045.2017.1382475>
- Eurobarometr (2022). Public opinion on the war in Ukraine. Brussels: European Parliament.
- Freudlsperger, C., & Schimmelfennig, F. (2022). Rebordering Europe in the Ukraine War: community building without capacity building. *West European Politics*, 46(5), 843–871. <https://doi.org/10.1080/01402382.2022.2145542>
- Gorzela, G., & Jałowicki, B. (2014). Koniunktura w Polsce lokalnej 2013. *Studia Regionalne i Lokalne*, 4(58), 5–24. <https://doi.org/10.7366/1509499545801>
- Jańczak, J. (2020). Re-bordering in the EU under Covid-19 in the First Half of 2020: A Lesson for Northeast Asia? *Eurasia Border Review* Second, 11, 2–16. <https://doi.org/10.14943/ebr.11.1>
- Kajta, J., & Opiłowska, E. (2021). The Impact of Covid-19 on Structure and Agency in a Borderland. The Case of Two Twin Towns in Central Europe. *Journal of Borderlands Studies*, 37(4), 699–721. <https://doi.org/10.1080/08865655.2021.1996259>
- Klatt, M. (2020). What has happened to our cross-border regions? Corona, Unfamiliarity and transnational borderlander activism in the Danish-German border region. *Borders in Perspective*, 4, 43–47. <https://doi.org/10.25353/ubtr-xxxx-b825-a20b>
- Komornicki, T., Wiśniewski, R., & Miszczuk, A. (2019). Delimitacja przygranicznych obszarów problemowych. *Przegląd Geograficzny*, 91(4), 467–486. <https://doi.org/10.7163/PrzG.2019.4.2>
- Konrad, V. (2021). New Directions at the Post-Globalization Border. *Journal of Borderlands Studies*, 36(5), 713–726. <https://doi.org/10.1080/08865655.2021.1980733>
- Lara-Valencia, F., & Laine, J. (2022). The Covid-19 Pandemic: Territorial, Political and Governance Dimensions of Bordering. *Journal of Borderlands Studies*, 37(4), 665–677. <https://doi.org/10.1080/08865655.2022.2109501>
- Leutloff-Grandits, C. (2023). “We are not Just the Border of Croatia; This is the Border of the European Union ...” *The Croatian Borderland as*

- "Double Periphery". *Journal of Borderlands Studies*, 38(2), 265–282. <https://doi.org/10.1080/08865655.2022.2104340>
- Łukowski, W., Bojar, H., & Jałowiecki, B. (2009). *Społeczność na granicy*. Wydawnictwo Naukowe Scholar.
- Martinez, O. (1994). The dynamics of border interaction: new approaches to border analysis. In C. Scholfield (Ed.), *Global boundaries* (pp. 1–15). Routledge.
- Medeiros, E., Ramírez, M., Ocskay, G., & Peyrony, J. (2021). Covidfencing effects on cross-border deterritorialism: the case of Europe. *European Planning Studies*, 29(5), 962–982. <https://doi.org/10.1080/09654313.2020.1818185>
- Nail, T. (2013). The crossroads of power: Michel Foucault and the US/Mexico border wall. *Foucault Studies*, 15, 110–128. <https://doi.org/10.22439/fs.v0i15.3993>
- Nitoui, C. (2017). Still entrenched in the conflict/cooperation dichotomy? EU–Russia relations and the Ukraine crisis. *European Politics and Society*, 18(2), 148–165. <https://doi.org/10.1080/23745118.2016.1197875>
- Opilowska, E. (2021). The Covid-19 crisis: the end of a borderless Europe? *European Societies*, 23(1), 589–600. <https://doi.org/10.1080/14616696.2020.1833065>
- Opiola, W., & Böhm, H. (2022). Euroregions as political actors: managing border policies in the time of Covid-19 in Polish borderlands. *Territory, Politics, Governance*, 10(6), 896–916. <https://doi.org/10.1080/21622671.2021.2017339>
- Opiola, W., Czepil, B., Dębicki, M., Ganowicz, E., Kajta, J., Kovályd, K., ... & Pidgrushniy, G. (2022). War and politics. The 2022 Russian invasion of Ukraine and refugee crisis on the eastern EU border from the perspective of border studies. *Border and Regional Studies*, 10(1), 7–22. <https://doi.org/10.25167/brs4791>
- Paasi, A. (2022). Examining the persistence of bounded spaces: remarks on regions, territories, and the practices of bordering. *Geografiska Annaler: Series B, Human Geography*, 104(1), 9–26. <https://doi.org/10.1080/04353684.2021.2023320>
- Paül, V., Trillo-Santamaría, J., Martínez-Cobas X., & Fernández-Jardón C. (2022). The Economic Impact of Closing the Boundaries: The Lower Minho Valley Cross-Border Region in Times of Covid-19. *Journal of Borderlands Studies*, 37(4), 761–779. <https://doi.org/10.1080/08865655.2022.2039266>
- PLRU (2023). *Dodatkowe środki przyznane polskim beneficjentom projektów*. <https://www.plru.eu/pl/aktualnosci/969,Dodatkowe-srodkiprzyznane-polskimbeneficjentom-projektow>
- Prokkola E. K. (2022). Border security interventions and borderland resilience. In D. J. Andersen, & E. K. Prokkola (Eds.), *Borderlands resilience. Transitions, Adaptation and Resistance at Borders* (pp. 20–36). Routledge. <https://doi.org/10.4324/9781003131328-3>
- Prokkola E. K., Ridanpää, J. (2022). New geopolitics and the Finnish-Russian border as a marker of territoriality. *Political Geography*, 99, 1–3. <https://doi.org/10.1016/j.polgeo.2022.102701>
- Radil, S. M., Pinos, J. C., & Ptak, T. (2021). Borders resurgent: towards a post-Covid-19 global border regime? *Space and Polity*, 25(1), 132–140. <https://doi.org/10.1080/13562576.2020.1773254>
- Raport CWD (2022). *Raport podsumowujcy prace partnerstwa v pilotażu CWD. Partnerstwo Stowaryszenie Warmińsko-Mazurskich Gmin Pogranicza*. [https://pograniczewm.pl/media/attachments/2022/03/31/5\\_pogranicze\\_raport\\_podsumowujcy\\_prac\\_partnerstwa.pdf](https://pograniczewm.pl/media/attachments/2022/03/31/5_pogranicze_raport_podsumowujcy_prac_partnerstwa.pdf)
- Richardson, K., & Cappellano, F. (2022). Sieve or Shield? High Tech Firms and Entrepreneurs and the Impacts of COVID 19 on North American Border Regions. *Journal of Borderlands Studies*, 37(4), 805–824. <https://doi.org/10.1080/08865655.2022.2038230>
- Rosik, P., Komornicki, P., Duma, P., & Goliszek, S. (2022). The effect of border closure on road potential accessibility in the regions of the EU-27. The case of the COVID-19 pandemic. *Transport Policy* 126, 188–198. <https://doi.org/10.1016/j.tranpol.2022.07.008>
- Sagan, I., Kolosov, V., Studzińska, D., Zotova, M., Sebentsov, A., & Nowicka, K. (2018). The local border traffic zone experiment as an instrument of cross-border integration: The case of Polish-Russian borderland. *Geographia Polonica*, 91(1), 95–112. <https://doi.org/10.7163/GPol.0102>
- Sitek, S. (2016). *Uwarunkowania rozwoju lokalnego na obszarach przygranicznych*. Wydawnictwo Uniwersytetu Śląskiego.
- Sohn, C. (2014). Modelling Cross-Border Integration: The Role of Borders as a Resource. *Geopolitics*, 19(3), 587–608. <https://doi.org/10.1080/14650045.2014.913029>
- Statistics Poland (2023). *Ruch graniczny oraz przepływ towarów i usług na zewnętrznej granicy unii europejskiej na terenie Polski*. GUS.
- Studzińska, D. (2021). *Zmiana roli i charakteru granicy polsko-rosyjskiej a warunkowania rozwoju polskiej strefy przygranicznej*. Wydawnictwo Uniwersytetu Gdańskiego.
- Śleszyński, P., Bański, J., Degórski, M., & Komornicki, T. (2017). Delimitacja obszarów strategicznej interwencji państwa: obszarów wzrostu i obszarów problemowych. *Prace Geograficzne, Państwowa Akademia Nauk*.
- Śleszyński, P., Herbst, M., & Komornicki T. (2020). *Studia nad obszarami problemowymi w Polsce*. PAN KPZK.
- The Defense Post (2023). *Poland Deploys Anti-Tank Barricades on Russian, Belarusian Borders*. <https://www.thedefensepost.com/2023/03/15/poland-barricades-russia-belarus/>
- Vendinaa, O., Gritsenko, A., Zotova, M., & Zinovyev, A. (2021). Identity of Kaliningraders: Influence of Social Beliefs on the Choice of Self-Identification. *Social Geography*, 11(4), 533–542. <https://doi.org/10.1134/S2079970521040195>
- Warmińsko-Mazurskie 2030 *Strategia rozwoju społeczno-gospodarczego*. (2020). Zarząd Województwa Warmińsko-Mazurskiego.
- Washington Post (2023). *The 'barbed-wire curtain' dividing Europe from Russia and Belarus*. Retrieved from <https://www.washingtonpost.com/world/2023/03/15/europe-russia-belarus-fence/>
- Zarycki, T. (2011). Peryferie czy pogranicza? Krytyczne spojrzenie na współczesne sposoby posługiwania się pojęciem „pogranicza”. In B. Jałowiecki & S. Kaprański (Eds.), *Peryferie i pogranicza. O potrzebie różnorodności* (pp. 33–54). Wydawnictwo Naukowe Scholar.

**Please cite this article as:**

Studzińska, D. (2023). Borderlands in times of crisis: The possibility of de-marginalisation of the Polish border zone with Russia after the outbreak of war in Ukraine. *Moravian Geographical Reports*, 31(3), 120–128. <https://doi.org/10.2478/mgr-2023-0011>



The Czech Academy of Sciences, Institute of Geonics

Palacký University Olomouc, Faculty of Science

journal homepage: [www.geonika.cz/mgr.html](http://www.geonika.cz/mgr.html)doi: <https://doi.org/10.2478/mgr-2023-0012>

# Compact and polycentric urban forms as intertwined concepts: Learning from the impacts of Covid–19 retail restrictions on spatial (in)equalities in Brno (Czech Republic)

Marek LICHTER <sup>a</sup> , Jiří MALÝ <sup>b\*</sup>

## Abstract

Urban structure conceptualisation using compact and polycentric city narratives is often performed separately. However, although both are based on different spatial grammars, they are inextricably linked. The spatially equitable distribution and accessibility of urban functions are often seen as their main contributions. This paper uses the unprecedented circumstances of the COVID-19 pandemic to further analyse the relationship between the two narratives, using the radical transformation of a retail network in a post-socialist city (Brno, Czech Republic) as an example. Based on an in-depth analysis of government measures aimed at preventing the spread of the coronavirus and their coverage in the media, operational changes among all stores in the city are quantified. A comparative spatial analysis then shows that, in addition to economic inequalities, spatial injustice was exacerbated by the position of the central government, with varying degrees of intensity depending on the type of urban structure. It is argued that the resilience potential of polycentric and compact structures is very low, especially in the absence of retail planning and reflection upon spatiality in ensuring social equity.

**Keywords:** compact city, polycentricity, spatial justice, retail, COVID-19

**Article history:** Received 26 May 2023, Accepted 12 September 2023, Published 30 September 2023

## 1. Introduction

New socioeconomic processes associated with globalisation and rising consumption have been altering traditional urban forms related to industry and production over the last few decades (Hall & Pain, 2006; Sassen, 2000). The spatial organisation of society has evolved into multifaceted worldwide networks which interconnect different economic actors, both physically and virtually (Kloosterman & Lambregts, 2001). The space of places, that is, the space of rather enclosed everyday social and spatial routines (travel to work, shops, home), is now embedded into the more dominant space of flows—flows of people, goods, capital, technology, information and innovation (Castells, 1996).

When considering the material transformations of heavily urbanised areas, sprawling urban landscapes are the main visible outcome (Artmann et al., 2019; NuiSSL & Rink, 2005). Compact and polycentric city narratives emphasising the equitable spatial redistribution of basic services, in particular, have become the political and planning response to this sprawl (Bailey & Turok, 2001; Dempsey, 2010). However, the operationalisation of policy goals into planning tools and actual urban development has its limits. One problem is the lack of understanding of how polycentric and compact structures affect the functional space of the city and how they relate to the social sphere in residents' everyday lives.

The research objective of this paper is to highlight the limitations of the polycentric and compact city concepts as imaginations of sustainable spatial development. We use the transformation of the retail network in the post-socialist city of Brno (Czech Republic) as it exhibits features of both a compact and a polycentric city. The transformation of the retail network is both long- and short-term. The long-term transformation comes as a result of socialist directive planning that post-socialist liberalisation tendencies and internationalisation have modified. The short-term changes have been caused by imposed socioeconomic restrictions in reaction to the COVID-19 pandemic that has become, in many ways, unprecedented. The rapid onset of the pandemic disrupted spatial patterns of behaviour and (temporarily) severed existing (extra-) urban ties. We believe that such a unique situation serves as a distinct spatial laboratory revealing the pros and cons of both planning concepts which may otherwise be suppressed or untapped. The research thus asks: What impact has this sudden restriction of retail amenities had on the spatiotemporal structure of the city and the accessibility of retail? What are the implications for understanding compact and polycentric urban forms?

Using textual analysis of government regulations together with their coverage in the media, unique time series data of the retail network development in Brno and a model application of restrictive

<sup>a</sup> Department of Geography, Masaryk University, Brno, Czech Republic

<sup>b</sup> Department of Environmental Geography, Institute of Geonics of the Czech Academy of Sciences, Brno, Czech Republic  
(\*corresponding author: J. Malý; e-mail: [jiri.maly@ugn.cas.cz](mailto:jiri.maly@ugn.cas.cz))

measures (applied in the Czech Republic) on the operation of individual stores, the paper compares retail accessibility and spatial patterns in two cases:

1. Retail regulation based on the government COVID-19 measures, and
2. Hypothetical regulation based on the government COVID-19 measures without economic discrimination.

Hence, the spatial analysis reveals differences in the accessibility of retail between a situation of real store closures (retrospectively designated as discriminatory) and a hypothetical situation in which a number of retail units would remain open (assuming the application of an economically non-discriminatory framework). The results are interpreted with consideration for spatial justice and equity principles, the intended outcomes of polycentric and compact urban structures. At the same time, the importance of spatial policies that must be addressed in the face of economic or legislative decisions is highlighted. From this point of view, we assert, that rather than attempting a straightforward comparison of the two spatial planning concepts, this article offers a perspective on the specific post-socialist urban context and draws on the unprecedented consequences of the COVID-19 pandemic upon the functioning of urban retail.

## 2. Compact and polycentric structures: Towards spatially just urban settings?

Urban sprawl – often characterised as leapfrog or scattered development, commercial strip development, or large expanses of low-density or single-use development (Ewing, 1997) – has several negative economic (e.g. Carruthers & Ulfarsson, 2003), social (e.g. Nguyen, 2010), physiological (e.g. Ewing et al., 2003) and ecological (e.g. Johnson, 2001) consequences which have been deeply analysed. The opposite of sprawl is often referred to as a compact urban form. Dempsey (2010) highlights the main characteristics of compact cities and argues that the compact city has a relatively high residential density, mixed land uses, an efficient public transport system and predispositions that encourage walking and cycling. It supports low energy consumption, reduces pollution, enhances social interactions and safety and represents an urban form with less intense car mobility. Hence, the promotion of compact urban development, abandoned space reuse, vacant inner lot development and urban densification, have been identified as the primary strategies to manage the manifold consequences of urban sprawl.

Despite the difficulties in turning the theoretical spatial imagination of the compact city into practice (Burton, 2002), some evidence about the benefits of compact urban forms (compared to the disadvantages of sprawl) has been provided. These include shorter travel-to-work distances (Boussauw et al., 2012), the higher vulnerability of sprawling metropolitan regions to climate change (Stone et al., 2010) and evidence from the effective implementation of anti-sprawl policies in Portland, Oregon and Randstad, Holland (Dieleman and Wegener, 2004).

Acceptance of the ‘compact’ narrative in planning policies was made possible by the assumption of greater social equality that a compact city provides. The idea of social justice in the sense of a fair distribution of resources has permeated spatial policies and visions of compact cities (Ancell & Thompson-Fawcett, 2008; Zhu & Guo, 2022). Compactness has many characteristics, and each may have a different impact on social equality. For example, Burton (2000) claims that compact forms may offer benefits such as improved public transport use, reduced social segregation and better access to facilities. While this spatial extension of the traditional Rawlsian theory of justice adds space as a fundamental aspect affecting the lives of the most disadvantaged, only the consideration of cultural, temporal and structural processes brings deeper insight into urban spatial inequalities (Soja, 2010).

Compact city proponents usually base their arguments on the abundant negative consequences related to uncoordinated and sprawling urban forms. Yet there are high numbers of urban dwellers and companies leaving dense core cities for the outer urban rim in search of better living, environmental or business conditions (Couch & Karecha, 2006). The concentration of human activity in large metropolitan regions is accompanied by deconcentrating processes taking place on the intra-metropolitan level. Residential and commercial suburbanisation represent, in some urban regions, dominant redistributive processes (Lang, Blakely & Gough, 2005; Stanilov & Sýkora, 2014), which seriously impact how core cities function.

Scholars are now discussing spatial planning visions that would mitigate overcrowding, inaccessibility and low environmental quality in order to make cities healthier, greener and more liveable, for example, via proactive measures focused on attracting investment and people into other (less populated) regions and cities—in line with the territorial cohesion discourse (Medeiros & Rauhut, 2020). In contrast to traditional central place and hierarchical urban system models (Berry, 1964; Christaller, 1933), the polycentric narrative has helped to explain the increasing complexity of urban systems which become less hierarchically structured and integrated into broader urban networks. Unlike monocentric (concentric/radial) cities, often seen as a spatial arrangement producing negative environmental and economic externalities (traffic, overpopulation, congested infrastructure), polycentric development is understood as a concept offering positive externalities and economies of scale typical for large agglomerations while mitigating agglomeration diseconomies and urban sprawl that occur in monocentric urban forms (Bailey & Turok, 2001).

As a highly scale-dependent concept, polycentricity takes a different shape and structure at the intra-urban level (Malý, 2019). The polycentric (multinucleated) city is defined by the existence of sub-centres, understood as a natural concentration of jobs, population, services and other activities (Giuliano, 1991). These are perceived as a counterweight to the urban core. Networked sub-centres (secondary centres) are a prerequisite for shortening commuting distances, lowering costs and, indirectly, mitigating traffic load or excessive mobility (Kang-Rae & Banister, 2007; McMillen, 2001).

Some of the features of a compact and polycentric city are incorporated in the concept of the “15-minute city” (15mC), which has been gaining the attention of urban scholars in recent years. This acronym hides principles that originate in the philosophy of chrono-urbanism that forms the grounds of time-oriented policies and planning. The premise of the 15mC is that the time spent travelling is inversely proportional to the quality of life. Thus, this concept aims to construct and re-develop cities with primary focus on accessibility to housing, entertainment, schools, work, healthcare, and commerce. The purpose of 15mC is to bring activities closer to people instead of transporting people to them. The time limit is equivalent to the walking and cycling accessibility of urban functions (Moreno et al., 2021; Marino et al., 2023).

The emphasis on localism is reflected in several aspects. Mixed (multifunctional) development is supposed to ensure intensive contacts between the inhabitants of the individual neighbourhoods and to reduce dependence on the car. As Zhang et al. (2021) noted, 15mC objectives can also be consistent with the principles of polycentric development. Proponents of the concept also argue that the increasing digitalisation of the world (Fourth Industrial Revolution) is leading to a decreasing need for individual commuting. For example, (long) daily commuting can be replaced by online work (Allam et al., 2022). The popularity of 15mC has been boosted in recent years by the COVID-19 pandemic. Although the 15mC concept originally followed the need for sustainability

and climate change responsibility, the pandemic revealed other related contexts, especially the socio-spatial ones. For example, it was crucial to ensure the availability of basic human needs (food, water, material goods), especially for socially vulnerable groups.

However, the applicability of the 15mC concept has its limitations. It is challenging to implement it in already very fragmented cities (North America, Southeast Asia). On the contrary, it is easier to enforce the imagination in more compact European cities. The 15-minute limit is also problematic regarding universality of its principles (walking speed, cycling speed), i.e. it does not consider people with disabilities (Khavarian-Garmsir et al., 2023).

Although polycentric and compact narratives are based on different theoretical foundations and spatial grammar, both are supposed to combat the negative externalities of urban sprawl and land fragmentation by providing a fair redistribution of urban functions and thus ensuring spatially just cities (after all, 15mC can be considered a specific, although probably unintended attempt of their integration). Yet, there is still a lack of knowledge about how these concepts interlink despite their common planning features, spatial (urban) dimensions and socially egalitarian goals. This paper seeks to describe this relationship through the lens of sudden and intense changes to spatiotemporal patterns in the retail network.

### 3. Overlapping urban forms in Central and Eastern European post-socialist cities: Example of the retail network

The urban forms of post-socialist cities in Central and Eastern European (CEE) countries are shaped mainly by historical medieval structures, relics of (proto-)industrial buildings, socialist estate housing construction and industrialisation, and post-socialist suburban single-family housing projects and commercial deconcentration to the outskirts (Szelenyi, 1996). Although the pre-modern urban development period was similar to Western Europe, socialist directive planning resulted in the emergence of specific urban structures and links with the original, largely organic urban growth. The result is, therefore, a more or less compact core structure transitioning into densely populated housing estates (Hirt, 2013). The strength of the transport links between these typologically different urban forms is then influenced by a number of factors, such as the efficiency of public transport, the existence of physical barriers (industrial sites, brownfields) and the centrality of the sub-locations and the degree of mobility generated (Seidenglanz et al., 2016).

In this respect, a specific feature of many post-socialist CEE cities is the very dense public transport network inherited from the socialist era (Pucher & Buehler, 2005), alongside which individual car transport began to make significant progress in the period of post-socialist transformation. Thus, paradoxically, the current enormous potential in the use of public transport in some post-socialist cities may not be fulfilled purely because of the sudden widespread availability of the car, which, given the suppression of individualism in the socialist period, is now all the more used and understood as a status symbol, a manifestation of freedom and independence (Pojani et al., 2018). Factors of economic efficiency, speed or flexibility of individual transport modes may then play a secondary role.

The layering of urban structures and socio-spatial habits have implications for the functioning of the city as a whole. To understand the relationship between urban form and urban everyday life, it is necessary to identify the basic functional elements of the city. Beyond jobs, it is retail that defines the spatial patterns of human activity, and that clearly illustrates the benefits and drawbacks of specific urban forms and their linkages

(Fernandes & Chamusca, 2014). In post-socialist cities, the retail sector, as a significant feature of urban centrality, has recently undergone a dynamic transformation that results not only in various shopping behaviours and consumer preferences but also in overlapping urban schemes and spatio-functional patterns in the retail environment (Kunc & Křižan, 2018).

Due to a lack of investment in internal trade (unlike in advanced market economies), the socialist central-command economy was unable to provide sufficient retail services. In Czechoslovakia, for illustration, underinvestment in the retail sector has resulted in only about half the level of service standards compared to Western European countries (Drtnina & Krásný, 1989 cited in Kunc & Novotná, 2022). The spatial standardisation of the services and trade supply was based on a central settlement system, the result of which was an overloaded retail network in centres (monocentric model), illogical shop and shopping centre construction in rural settlements, and housing estates with high population density suffering from insufficient retail facilities (Szczyrba, 2005). Although some neighbourhoods struggled with commercial underdevelopment, the shops concentrated within the compact city were an important socio-spatial hub in the everyday lives of local residents.

The privatisation and commercialisation of the retail network after 1989 brought changes to the spatial urban structure. While the initial atomisation stage showed signs of decentralisation among retail structures and an increase in the number of retail outlets, the subsequent internationalisation stage increased the concentration of retail floor area and brought about an expansion of new retail formats (e.g. hypermarkets, discount stores) often located on the peripheral but in rather accessible (by car) locations within metropolitan areas (Garb & Dybicz, 2006). Although the retail supply continues to grow and, especially in large cities, expand their regional importance in terms of daily shopping trips (Maryáš et al., 2014), the spatial concentration of new retail forms is reflected in the polycentric nature of retail, where many shopping centres are dependent on customers commuting by car and looking for a fun shopping experience (Spilková, 2012). However, the distribution of shopping malls may not be spatially balanced. As a study in Hungary shows (Sikos, 2022), the location of large-scale retail formats is not so much a result of spatial planning as it is a consequence of the spatial polarisation of purchasing power, with many larger cities in poorer regions (often border regions) not having a shopping mall within their districts.

This concentration phase is slowly ending as the retail sector in the CEE market reaches stabilisation (Coe & Hess, 2005). New localisation strategies for stores with smaller space requirements are emerging. These stores are located in central city districts and are able to compete with international large-format stores on city outskirts through specialisation, product quality or specific opening hours. This is leading to distinct time-space retail configurations (chronotopes) that produce and shape specific urban rhythms (Muliček & Osman, 2018). Moreover, there is a differentiation in the portfolio and services of individual retailers, which is reflected both in how the socioeconomic profile of customers is structured and, in their ability, to reach the products. Not only smaller stores but also retail chains place emphasis on the provision of organic and local products (hyperlocal retail), incorporate hybrid sales concepts enabling convenient and quick shopping (omnichannel), offer in-store staging (testing the products in the store) or tailor-made services (Kunc & Křižan, 2022).

The significant share of e-commerce and penetration of smart technologies (increasingly utilising artificial intelligence) in retail at the moment (Priporas et al., 2017), together with local entrepreneurial strategies competing with large retail chains, are having an impact on the spatiotemporal organisation of the retail network in CEE cities. The uneven distribution of specific

store formats is reflected in varying degrees of accessibility to different socioeconomic groups. However, the legacy of relatively well-equipped compact urban structures ensures the availability of basic fast-moving consumer goods even in declining inner-city neighbourhoods. This is particularly evident when compared to the largely sprawled urban environments of car-oriented urban societies in Canada or the United States (Hamidi & Ewing, 2014). The advantages of this compact retail structure—accessible by foot, bicycle, or public transportation—combined with large stores in the suburban fringe, creating a polycentric configuration of shopping malls, is that they generate a stable retail network with relatively fair accessibility across the urban population. However, the resilience of this network to external factors is questionable, as the case study below will show.

#### 4. Methods and data

The empirical analysis consists of two main steps. The first uses a review and textual analysis of Czech government regulations issued during the COVID-19 pandemic from early 2020 to April 2022 and a media analysis (online newspapers, social networks) focused on critiques and interpretations of specific restrictions and their discussion among relevant actors. Given the inconsistency in the formal structure of the publication of government measures and the frequent changes in the content of individual regulations, the issues highlighted in the media provide some guidance for the analysis. For instance, it was not uncommon for government regulations to be interpreted differently by the Minister of Health, the Director of the Institute of Health Information and Statistics of the Czech Republic and the Prime Minister. Hence, in addition to the main official government communication channels publishing the binding rules, newspapers with predominantly national coverage were analysed in order to clarify some ambiguously drafted regulations. The aim of this part of the analysis is to identify the main principles related to the opening of shops that were part of the government measures, and then to select those with the greatest potential spatiotemporal impact on the functioning of urban society. The focus was on finding the spatiotemporal context and the impact of the often universally enforced rules. The first phase of the analysis resulted in the identification of a time period (from 22 October to 2 December 2020) that was economically discriminatory towards shop operators. In the next empirical step, the same period is examined from a spatial justice perspective, that is, how the government regulations affected consumers in terms of the spatial accessibility of retail.

The aim of the second step is to assess the extent to which retail accessibility was affected by anti-COVID-19 measures. The quantitative spatial analysis works with data on the distribution of population and retail within the city borders of Brno (with the exception of a shopping centre and adjacent commercial zone located south of the city, but functionally integrated into the urban space). Retail data comes from Brno Retail Research (Data Brno, 2021a) and provides information about location, size of sales area ( $m^2$ ) and the products offered by stores in the city. Population data shows the distribution of permanent residents as of 2021 (Data Brno, 2021b). The spatial analytical units are the morphogenetic zones of the city (Data Brno, 2021a) and a grid cell network uses a grid side length of  $250 \times 250$  m.

The morphogenetic zones represent aggregated types of urban environment that reflect different material and urban socioeconomic development. The diversity of each zone is also the precondition for the differentiated development of the retail network, with different retail formats and assortments exhibiting specific locational strategies due to different space requirements or types of customers (Data Brno, 2021a). There are six morphogenetic zones (Fig. 1):

1. The urban core (an area of protected historic urban fabric),
2. The inner city (compact urban structures of the nineteenth and early-twentieth century adjacent the urban core),
3. The wider inner city (here, the compact urban structure is less distinct and includes a mix of apartment and family houses),
4. Villa neighbourhoods (residential single-family homes predominantly of higher socioeconomic status),
5. Prefabricated housing estates (large-scale monofunctional modernist housing estates built since the 1960s and complemented by new housing developments), and
6. The suburban zone, (a peri-urban area where original villages are mixed with new residential and commercial construction).

In order to examine the impact of the anti-COVID-19 measures, two layers of retail data were created. The first shows shops open based on government regulations. The second shows the same stores and also those stores whose closure was deemed economically discriminatory and illegal by court action. While the former depicts the actual situation at an examined period under the ordered restrictions, the latter is hypothetical and serves as a baseline against which the spatial effects of the applied measures are examined. In other words, the analysis compares the accessibility of shops whose opening was allowed under the anti-COVID-19 measures (a regulated retail layer, hereafter referred to as the RR layer) and those that should have been open had the discriminatory measures not been in force (a hypothetical retail layer, hereafter referred to as the HR layer).

The comparative analysis has two parts. The first examines how accessibility to the nearest store has changed as a result of applied regulations at the morphogenetic zone level. Using network analysis (GIS calculations), the walking time distance was measured by setting the average speed at 5 km per hour. The outcome is

- a. A comparison of the number of shops and their sales area between the RR and HR layers,
- b. A comparison of average time accessibility between the RR and HR layers, and
- c. The variation in the proportion of residents with good walking accessibility to the nearest shop (within 300 m) between the RR and HR layers.

Walking accessibility serves here as a proxy for compact city principles, as it points to the quality of amenity provision expressed through low mobility demands (short distances).

The second part of the analysis calculates the locational potential (LP) for residents at grid cell scale. For the centroid of each cell with 10 or more residents, the walking time distance to all stores (OD matrix) is derived using network analysis (GIS calculation). LP is an index that represents the difficulty of reaching all stores, where the importance of a store is determined by its sales area. LP is calculated as follows:

$$LP = \sum_{i=1}^n (S_i/T_i).$$

In this formula,  $n$  is the number of spatial units (grid cells), the  $S_i$  value is the sales area of a store ( $i$ ) and  $T_i$  is the time distance from a given grid cell to a store ( $i$ ). LP provides an opportunity to assess the overall accessibility of retail, with special emphasis on central retail spaces. The sales area serves here as a simple measure of centrality in terms of the significance of a particular store for its customers (the larger the sales area, the more potential customers). Hence, LP illustrates the accessibility of central retail spaces. Comparison of the two situations suggests a variation in the degree of polycentric retail arrangement for each residential



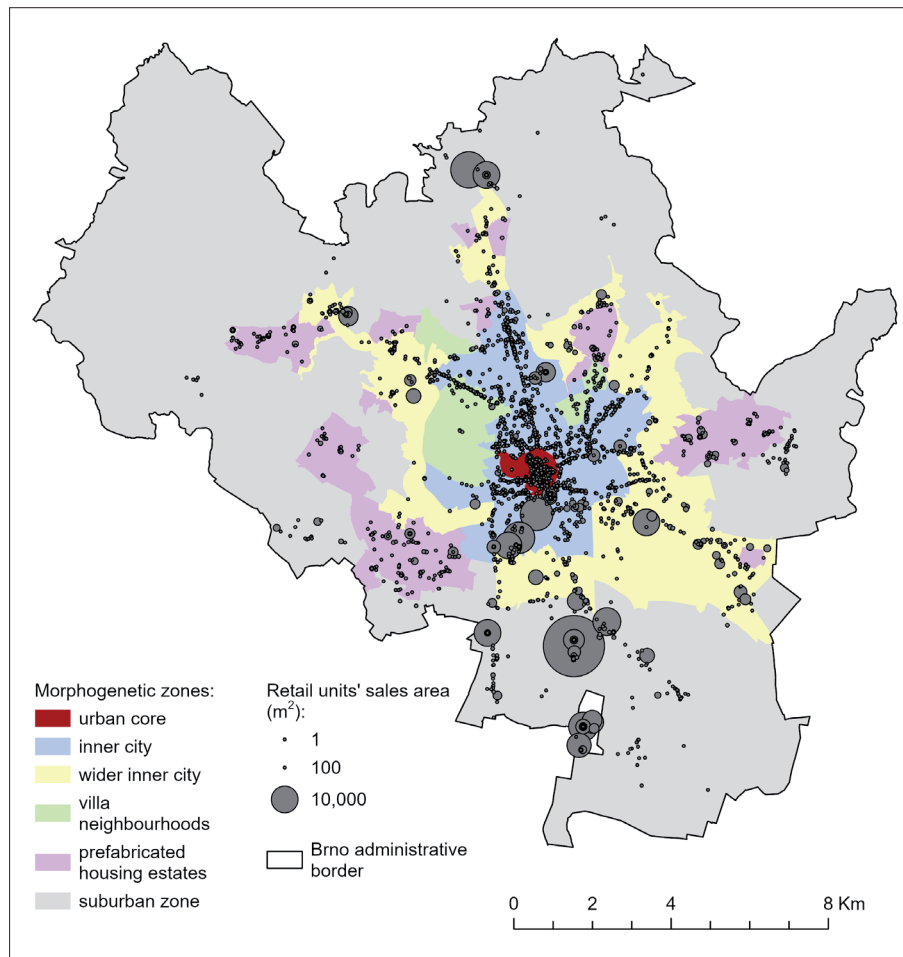


Fig. 1: Retail units and morphogenetic zones in Brno  
Source: authors' processing based on Data Brno (2021a)

locality under study (since there are several central retail spaces in Brno). Comparison of the LP values for RR and HR layers is achieved by standardising the values using the z-score method. The difference between standardised LP values for RR and HR layers then shows the relative change in the LP of a given site (grid cell) compared to other sites.

## 5. Results

### 5.1 Covid-19 pandemic shopping rules and their implications for changes in the spatiotemporal organisation of Czech society

The COVID-19 pandemic has had an extraordinary impact on the daily behaviour of the population, not only in terms of personal (physical) discipline (voluntary isolation, home office prioritisation) but also in terms of bureaucratic and health measures (British Academy, 2021). CEE countries have not faced a similarly massive spread of respiratory diseases in recent decades. Thus, in terms of impact, parallels can perhaps only be sought with natural disasters, although in many aspects it is a completely unprecedented situation (Krisp & Špatenková, 2010).

During the 2020–2022 period, the Czech government applied restrictive measures that had significant impact on the functioning of retail facilities as well as those of education, sports, services and so on (Government of the Czech Republic, 2022).<sup>1</sup> These regulations were applied centrally-directive in cooperation with

regional public health authorities and, therefore, (almost) absent non-specialist (health) public discussion with other affected actors (municipal government, local politicians). Corrections to the applied rules were achieved mainly through media coverage or public response on social networks. However, individuals (employees of security agencies, etc.) or institutions were required to 'supervise' compliance with restrictive rules, albeit without new (expanded) powers to enforce them (Government of the Czech Republic, 2020a). The content and strictness of the rules, especially in the first weeks of the pandemic, were variable and very chaotic. An example is the complete closure of the Litovel and Uničov regions, in which the first outbreaks occurred. These regions (municipalities) were immediately and hermetically sealed at 3 a.m. at the behest of an emergency committee. Thus, for example, the Litovel Municipal Police could not operate in the town as the officers lived outside the municipality, and there were no respirators ready for them. The total number of confirmed people infected on the day of the closure was 25 (Olomouc Regional Public Health Authority, 2020; Tauberová, 2020). In the later stages of the pandemic, such a hermetic closure was no longer applied.

Another controversial measure having a spatial impact was that of 1 March 2021 when it was not possible to travel outside home district for three weeks except in special cases (commuting, family care, need for medical care, dealings with a public agency, arranging for pet care, attending a funeral or travelling for an

<sup>1</sup> The applied medical-bureaucratic measures and individual approach to the COVID-19 pandemic were not the same all the time. In the first months of 2020 and 2021 particularly, there was significant tightening of rules and restrictions on personal freedoms compared to other parts of the year. The analyses thus relate to the situation relative to the contingency measures at a particular time.

exam). This closure was also applied to retail as part of an effort to reduce the spread of the coronavirus. However, almost immediately after the application of the rules, a local exemption was given to the inhabitants of the Plzeň-City district – a large part of the district is occupied by the city of Plzeň with approximately 175,000 inhabitants. They were allowed to shop at the Globus shopping centre, located just outside the district boundary. The arguments for this exemption were the need to buy food and the popularity of the shopping centre (MV ČR, 2021). An even more significant exception was the merging of the Brno-město (covering the whole city of Brno) and Brno-venkov (hinterland) districts. The merger was argued to be natural, that is, that the city and its hinterland are so interconnected they could not be separated. From a retail perspective, it should be noted at this point that just outside the southern boundary of Brno is a retail park which includes a large amount of Brno's retail space. Similarly, more than 40 other municipalities from the rest of the country with intensive cross-district relations applied for an analogous exception, mainly for shopping opportunities. Most were not approved (Vlčková, 2021). According to the spokesperson for the Ministry of the Interior, 'Such requests are not granted as the government measures adopted are aimed at minimising population movements across district boundaries' (Vlčková, 2021). As a result, large shopping centres were favoured over smaller outlets as regards limited cross-district-border mobility.

The restrictive rules were gradually made more systematic. The intention of the government was to create a predictable plan for anti-epidemic measures. The final product of this effort was PES (an acronym for 'anti-epidemic system' in Czech), which was preceded by several other forms of public health protection systems. Following the logic of this system, decisions were subsequently made to close down individual facilities (stores, playgrounds etc.) and define other operational options for them (PES MZ ČR, 2020). However, the universality of the regulation soon ran into its limits. The rules (protection levels) were often not applied strictly on the day an epidemic level was exceeded but were dependent on the outlook of models, which were saturated by epidemiological data. The rules were identical across the country, that is, the same rules were applied to shopping malls (mainly located in large cities or in their hinterlands) as well as the smallest of shops regardless of location.

For the purpose of this article, it is not necessary to describe the entire list of restrictions here. Moreover, the rules were weakened or tightened according to the epidemiological situation, and at the same time, there were exceptions. Nevertheless, the main principles dictating the opening of facilities are summarised in the three points listed below.

#### ***Restriction of sales hours – an obligation and, later, recommendation to prioritise times for vulnerable groups***

The health risks associated with COVID-19 led relatively early to an effort to protect vulnerable groups of citizens (people aged 65 and over, people with disabilities and illnesses). The government, therefore, defined prominent times (time prioritisation) during which only groups of vulnerable people were permitted to enter food stores, drugstores, pharmacies and so on. Other groups were not allowed to shop, and compliance with the rules was required by security guards and facility staff. However, from an interview with the chairman of the Council of Senior Citizens in the Czech Republic, this demand did not come from seniors but was implemented by the government itself (Spěváčková, 2020). In the first phase, a two-hour 10–12 p.m. interval was selected. However, this time was subsequently changed to a 7–9 a.m. interval (as the priority time). After a few days, another update was made, moving the prominent time interval to 8–10 a.m. The chaotic application of the regulation was a consequence of the conflicting priorities and, especially, the government's lack of

knowledge about the spatiotemporal behaviour and habits of the population—and not just its vulnerable groups (Government of the Czech Republic, 2020c; Kučerová, 2020).

The first 10–12 p.m. adjusted time interval was met with criticism, especially from pensioners, in part because seniors are used to shopping as soon as shops open, as claimed by the Czech Confederation of Commerce and Tourism (Novinky.cz, 2020). There was thus a mix of seniors shopping with the majority of society outside the exclusive times. At the same time, the Deputy Minister of Health and later Minister of Health Roman Prymula commented that seniors were dissatisfied with the shopping hours because they would miss discount promotions (iRozhlas, 2020b). For these reasons, the interval was shifted to an earlier time position. Seniors were the first customers to enter disinfected stores as soon as they opened; thus. The risk to this most vulnerable group was reduced to a minimum. However, this time conflicted significantly with the needs of productive society to purchase food before the start of their work shifts. Moreover, employees working 12-hour shifts may have been unable to shop at all due to the overall limited sales hours. The third change finally established the 8–10 a.m. time interval as it was also problematic that some shops were not open at 7 a.m., and, therefore, the seniors' exclusive time was reduced. This final prominent time was applied to shops with a sales area of more than 500 m<sup>2</sup>. For all other operators, the general rule was that a person from the health risk group (seniors, disabled people) had to be served first; thus, they did not have to wait in line with other people for their turn in the small shops.

#### ***Visitor limitation by sales area (number of m<sup>2</sup> per person)***

This rule was applied mainly on the basis of the initial knowledge of the spread of the coronavirus and should have led to the adherence of spacing between persons. The ratio of the number of customers did not change very often. At first, it was necessary to keep 15 m<sup>2</sup> per person, and later 10 m<sup>2</sup> was enough. Limiting the number of persons as regards the sales area should not automatically have led to the closure of small shops (with an area of less than 10 m<sup>2</sup>) – only one person should then have been allowed to enter, with other customers forced to wait in line. However, from the government's perspective, small shops had to remain closed as their opening would lead to a 30% increase in the mobility of the population – as the health minister Jan Blatný said in a TV interview (Bohuslavová, 2020). Thus, although smaller shops would be able to ensure spacing between persons, increased population mobility would contribute to a more rapid spread of the virus. This led to an unwillingness to allow the sale of certain products (toys, stationery, etc.) typically associated with these smaller units.

#### ***Restrictions on the sale of the product range***

Only an assortment of basic and necessary products (food, medication, glasses, telecommunication devices, feed, etc.) were allowed. A similar logic of necessity was applied to services. For the most part, services that included personal contact between customer and service provider were prohibited.

The product range was the subject of many discussions and disputes. For example, the application of the strictest rules in the winter and spring of 2021 prevented the purchase of clothes and shoes (including for children) but allowed the sale of weapons and ammunition (iRozhlas, 2020a). The lack of justification for these steps was uncompromisingly criticised by the public. However, from the point of view of the retail network, disputes over the range of products between individual retailers are important. As was mentioned before, operators of large retail chains (Tesco, Globus, etc.) were favoured over small retailers in several periods. These retailers could also sell goods that could not be sold in other specialised (smaller) shops. This preference was the result of food

being sold as the predominant product, especially in supermarket- and hypermarket-type shops. 'Predominant' is the key word here because the sale of food as a product was never restricted. Large format shops thus stayed open with the possibility of selling clothes, sporting equipment or toys as 'complementary' goods. This logic implies a necessary change in the spatial behaviour of customers. They were forced to leave their usual purchasing habits and instead use the few open shopping centres (with the exception of e-commerce), where they could buy 'complementary' products (Government of the Czech Republic, 2020b). This situation was formally applied in practice between 22 October and 2 December 2020.

Sixty-three senators opposed this practice via a lawsuit brought to the Constitutional Court (Belšán & Niebauer, 2020). They characterised the rules as discriminatory and illegal. Although the rules were realigned before the court's decision, the court did annul at least some of the government measures still in use. In arguing against the favouritism of certain stores, the Constitutional Court argued that 'by its nature, it is evident, for example, that the essence of retail sales lies precisely in the fact that people visit shops close to their homes (or jobs) and therefore do not have to travel far and use public transport' (Constitutional Court, 2021, 18). This argumentation was then accompanied by the government's dissenting opinion, which, on the contrary, sees a change in purchasing patterns as normal and possible: 'Retail includes not only sales, e.g. in counter and self-service stores, but also supermarkets, hypermarkets, department stores, outlets, etc., where it is not true that people do not travel longer distances from their home or work to visit them. Incidentally, retail includes highly specialised stores, for which it cannot be ruled out (on the contrary, it can be assumed) that customers will travel longer distances to make purchases, as they simply do not have such a specialised store close to their home' (Constitutional Court, 2021, 27). As a result, the rules were equalised, and the sale of these complementary goods was also banned in large format stores. Unsellable goods were taped over. However, this ban was limited to specific shelves, and the sales area was not reduced. Hence, the number of customers (related to the previous visitor limitation by the sales area rule) who could enter the shop remained the same despite the limited amount of goods being sold.

Notwithstanding the subsequent adjustment of the restrictions and the court decisions, the end of October to the beginning of December 2020 was characterised by the effects of these COVID-19-related measures (see Tab. 1 for a simplified overview). Not only were these discriminatory from an economic point of view for shop operators (supply) but they also impacted the spatiotemporal organisation of the retail network and consumer patterns (demand). This is the subject of the subsequent quantitative analysis of retail network transformation which uses the city of Brno as a case study.

### 5.2 Covid-19-related retail changes with consideration for compact and polycentric structures: The case of Brno city

Brno is the second largest city in the Czech Republic with almost 400,000 inhabitants. On a national scale, it figures as a centre of justice, education and research. At the regional level, it

is a natural centre of economic activity, attracting commuters from its wider hinterland. During the post-socialist period, the heavily industrialised urban environment saw not only its physical space transformed but also its economic structure. These changes include a strengthening of the service sector, particularly in advanced producer services and IT. The most significant changes in Brno's retail network are also linked to the post-socialist transformation. In the period before 1989, retail units and a substantial amount of retail space were notably concentrated in the city's historic core, partly due to the earlier formation of the city (a distinct and compact medieval town core). Regarding spatial distribution, the urban core was also prioritised in the socialist period (retail centrality), but conversely, the peripheral areas struggled with a lack of amenities. The retail network hierarchy followed the Christallerian logic considerably – local shops interspaced with higher level retail units up to the town centre.

For this reason, the historical core was relatively well saturated. Even for new retail developments, spaces adjacent to the historic core were still preferred. The onset of the market economy after 1989 allowed for the emergence of specialised shops via ribbon development away from the city centre while simultaneously saturating the local market with previously unavailable goods (product saturation). A significant element was the addition of local shops into housing estates in order to meet daily consumption needs. However, the city's spatial formation was most influenced by the emergence of shopping malls, typically on the Brno's periphery. The advent of large format stores, especially after the turn of the millennium, changed the ratio of retail space in favour of the peripheries (Fig. 1). The consequence has been a significant change in consumer commuting and shopping rhythms and an overall change in shopping behaviour (Muliček & Osman, 2018).

As a result of the government regulations, the sales area of shops in Brno was reduced (Tab. 2). The highest relative decrease was in the compact urban structure (morphogenetic zones 1 and 2). The closure of these shops also had an impact on the highest relative increase in walking distance to the nearest shop. However, the significant density of shops in the central part of the city meant that the vast majority of residents still had a shop with basic daily necessities within walking distance. In this respect, the situation was worse in the dispersed development of the wider inner city and villa neighbourhoods (morphogenetic zones 3 and 4). The different initial conditions imposed by the spatial configuration of retail and population resulted in variable susceptibility to the applied government regulations. While the compact urban structure was most affected in terms of the decrease in retail sales area per inhabitant, the dispersed urban form was disadvantaged by a deterioration in time accessibility to retail.

The enormous impact on the urban core is evident when both layers are compared to each other relatively (Fig. 2). If the average retail sales area (m<sup>2</sup>) per resident is relativised to a value corresponding to 1 (for each of the layers separately), then the historic core was most affected by the government regulations. The urban core had approximately twice as little retail space available as it could have had. In all other zones, the relative value remained about the same.

Typology of restrictive measures		
Spatial	Temporal	Purpose-driven
<ul style="list-style-type: none"> <li>closure of persons in the home district</li> <li>visitor limitation by sales area</li> <li>closure of small shops and services</li> <li>home office prioritisation</li> </ul>	<ul style="list-style-type: none"> <li>restriction of sales hours</li> <li>privileged service and shopping time for health risk groups</li> </ul>	<ul style="list-style-type: none"> <li>closure of shops and services according to the type of service or assortment</li> <li>closure of playgrounds, schools, and other institutions</li> </ul>

Tab. 1: Summary of the COVID-19-related restrictive measures applied at the end of 2020 in the Czech Republic  
Source: authors' elaboration

Morphogenetic zone	Population	Average retail sales area (m <sup>2</sup> ) per resident			Weighted (residents) average time (min) to reach the nearest store			Share of residents (%) living within 300 m of the nearest shop		
		HR	RR	Change (%)	HR	RR	Change (%)	HR	RR	Diff.
1	4,640	10.1	4.0	-60.4	0.2	0.4	+61.8	100.0	100.0	0.0
2	108,530	1.2	0.8	-33.3	1.4	1.6	+14.1	94.3	92.2	-2.1
3	67,240	0.6	0.5	-16.7	2.7	3.1	+11.4	76.6	70.7	-5.8
4	21,585	0.3	0.3	0.0	3.7	3.9	+6.2	58.3	53.4	-4.9
5	126,496	0.4	0.3	-25.0	2.8	2.9	+5.3	73.6	69.9	-3.7
6	46,657	1.7	1.2	-29.4	5.1	5.6	+9.1	46.8	42.1	-4.7
SUM	375,148	0.9	0.6	-33.3	2.7	2.9	+8.8	76.3	72.5	-3.8

Tab. 2: Retail-related characteristics via comparison of HR and RR layers  
Source: authors' calculations based on Data Brno (2021a, 2021b)

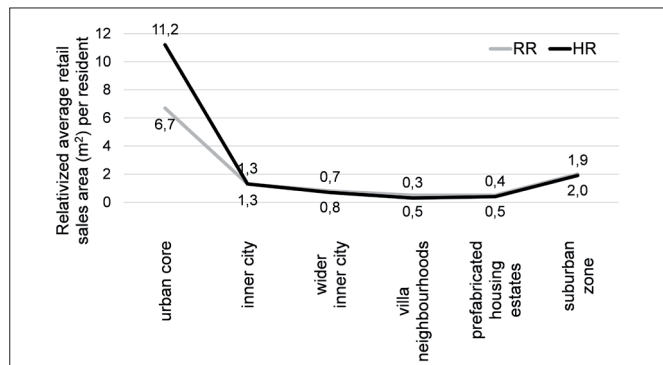


Fig. 2: Relativised average retail sales area (m<sup>2</sup>) per resident for both the HR and RR layers  
Source: authors' calculations based on Data Brno (2021a)

Closer insight into the Brno area is provided by a grid analysis. Comparing the standardised LP values between HR and RR layers allows for an assessment of the spatial differentiation of the impact of COVID-19-related regulations on retail accessibility, particularly with respect to central retail spaces. While the decline in absolute LP values due to the imposed government rules is observed across all locations (grid cells), the standardisation offers a closer look at the variation in potential store accessibility. Across the inhabited area of Brno, we can see parts with a significant relative deterioration in store reachability, but also, on the contrary, parts where the regulations' impact was not as strong (see Fig. 3 illustrating the range from the minor to the major worsening of LP2).

The city centre experienced the greatest loss of LP when compared to other locations. There was a significant reduction of smaller shops within a comfortable distance, disrupting the compactness of central urban structures. A noticeable decline in LP is also observed in the southern and south-eastern sectors of the city, where the closure of some larger stores within shopping centres and large-scale retail formats in the vicinity of major traffic intersections had a negative impact. The function of secondary retail centres in Brno's peripheral areas (especially in the southern part of the city in the cadastres of the former rural settlements) were significantly weakened. The polycentric character of urban retail was thus disturbed by the government sales regulations, affecting detrimentally areas located outside the compact core and near suburban retail centres in particular.

Local incidences of deteriorated LP are visible on shopping streets radially emerging from the urban core. The decrease in the density of shops in the urban parterre (building's commercial

ground floor) had the effect of weakening the commercial function of these streets. They are important both in terms of compactness (mixture with housing in urban-block structures) and as secondary centres for the urban districts in the wider city centre. Locations in the immediate proximity of some retail parks and shopping malls (Slatina- Řípská, Nový Lískovec-Kampus) but in more compact urban structures were also significantly affected by closure, but this was not as important for the value of LP in the wider area, where retail demand had been saturated by other shops due to the more highly built-up densities.

Contrariwise, a relatively minimal or negligible decline in LP was recorded in the areas of some prefabricated housing estates (the city districts located on the edge of the city's administrative boundaries), where the already insufficient amenities could not be further affected by the closure of a few shops. Thus, relatively speaking, these places were not as fundamentally affected by the government rules. The same applies to some areas of older compact (family) housing in the wider city.

To summarise, the negative impact of regulations in Brno was most pronounced primarily in the historic core. However, on a local scale, there was a similar negative impact of regulations when comparing the HR and RR layers of other historic village cores that later became part of Brno (e.g. the historic core of Královo Pole or Líšeň – the solitary dark grid cells with 'significant' or 'maximal' values in the areas of red 'moderate' values). These have, in principle, the same compact urban structure, although their influence on the surroundings was minimal due to the lower significance of these locations as central places. In contrast, in the purely residential areas east of the historic core, also with a compact structure, the effect was very weak. Locally, almost no specialised shops are concentrated here.

## 6. Discussion

The analysis pointed to the specific position of the historic compact centre. The historic core, however, was not disadvantaged *a priori* in terms of its position in the city but in terms of the health and bureaucratic rules applied, which, due to their specifications, most affected compact structures. This is, to some extent, a distortion of the (contemporary) compact city narrative ideal, where compact forms are seen as the solution to a number of present-day urban problems (Dempsey, 2010). The effect of discriminatory rules is then even more obvious if these compact structures are part of a polycentric city system. In this respect, the south-eastern area of the city was the most affected, suffering from the partial closure of the adjacent commercial zone; the weakening of the historic core, which is the next most accessible

<sup>2</sup> The standardised values are transformed into a more readable form by assigning the number 100 to the average values (z-score = 0). A standard deviation value of 1 is then given the number 20. The resulting standardised LP take values greater or less than 100. The difference between these values (= HR – RR) is interpreted as the impact of the COVID-19 measure on the worsening of LP and quantified as follows: minimum = -10.0 or less, negligible = -2.0 to -9.0, moderate = -1.9 to 1.9, significant = 2.0 to 9.9 and maximum = 10.0 or more.

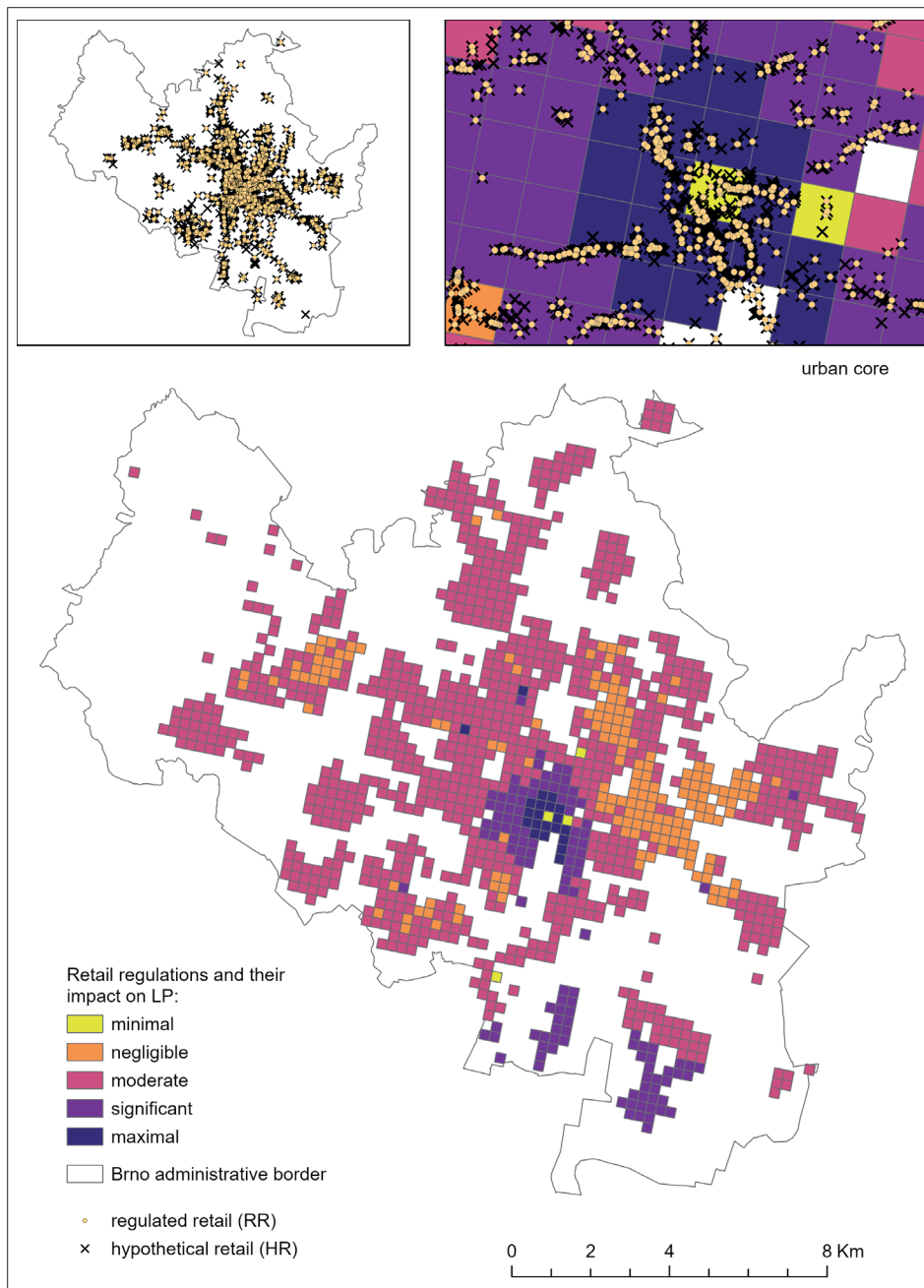


Fig. 3: The relative LP change based on the retail COVID-19-related regulations; minimal = minor worsening of LP, maximal = major worsening of LP

Source: authors' calculations and processing based on Data Brno (2021a)

centre for this area; and being surrounded by physical barriers (motorways) affecting functional connectivity with the territories beyond. The compact structure of the historic core, with its high retail density, thus also plays the role of a central location for more distant areas. In contrast, such a significant impact of COVID-19-related regulations on the whole area did not manifest in the areas of the wider compact centre, because their surroundings were sufficiently saturated by another secondary centre.

While a compact structure does not necessarily guarantee sufficient amenities, proximity to a central area may not be an advantage in the absence of alternative opportunities. Shop specialisation (product range) and the size of the sales area are factors that differentiate the urban retail structure. Although compactness may increase social equality in conjunctural periods through increased access to facilities (Burton, 2000), the vulnerability of urban forms has a direct impact on the spatial distribution of commercial amenities and changes in socio-

spatial inequity. In times of crisis (Kluge, 2022), this case study thus indicates that the urban structure, whether in a polycentric configuration or a compact city, shows a low degree of resilience. One of the key factors is the unpreparedness of crisis management and legislation in the context of retail planning, whose spatial distribution is primarily based on market mechanisms in the deregulated neoliberal economic environment (Fernandes & Chamusca, 2014).

As can be seen, various parts of the city were affected differently by the rules set during the period under examination. However, in this form of inequity, recall that it is also the customer's discriminatory position, which has arisen, in particular, from the unequal conditions of retail sales opportunities. In terms of spatial (in)justice at the city level, there has been no analysis or reflection upon the situation from the position of the public authorities. The affected areas, in which ideally (hypothetically) shops should have been open, have not been offered any

compensation for the restricted conditions. Unjust urban geographies (Soja, 2010) were exacerbated from a position of power without awareness of the interconnections with the social injustice produced.

Efforts to level the playing field were spurred on by parts of the political spectrum and also by lobbyists and traders, a result of the unfair privilege of sale (privilege of profit), as noted above. The subsequent legislative remedy for this unequal situation thus led to the righting of an economic injustice, whereby all traders were prevented from selling altogether, or, on the contrary, all traders, regardless of the parameters of their stores, could sell a particular type of product. Thus, economic factors, but not spatial ones, were decisive for institutionalised justice. Compensation programmes worked precisely on the logic of lost profits; that is, discrimination was recognised only in terms of disrupted retail business models. The situation is all the more paradoxical because most restrictive or even discriminatory measures were based on spatial constraints.

Given the deepened spatial injustice, economic inequity (increased transport costs, both in passenger transport and logistics) and time inequity (increased travel time) may have been partly passed on to customers. This effect can be understood all the more urgently as the mobility of, especially vulnerable groups with reduced motility (disabled, elderly, etc.), was affected by the restrictions during the COVID-19 pandemic. This observation reveals the fundamental interconnection between social and spatial structures as determinants of geographical space, conceptualised by Soja's socio-spatial dialectic (2010). However, it is necessary to remember that this is not only a material space, but also a virtual ICT-generated space (Priporas et al., 2017), where a significant part of retail transactions takes place, but with a considerable social differentiation of users. Thus, the accessibility of online shopping varies across different population groups (age, gender, education, etc.) and trying to improve it is one of the challenges of retail accessibility planning.

## 7. Conclusion

Using the unprecedented impacts of the COVID-19 pandemic on social and spatial urban relations, the study demonstrated that the interrelationship between the two narratives of the compact and polycentric city can be conceptualised through the measure of accessibility and locational potential of residential areas relative to retail supply. The result of the analyses showed how complicated urban space can be when restrictive rules are directly applied to the established spatial configuration of a city, here represented by the retail network. Brno, a post-socialist city, shows signs of higher retail density in compact structures while also offering a polycentric pattern of large-scale retail formats. Measuring its absolute sales area and accessibility values revealed that the historic core was substantially harmed by discriminatory regulations. In addition, relative deterioration in local accessibility was also observed for peripheral sites linked to secondary commercial centres. The form of a compact city thus fails in the case of a unique territorial concentration of functions that has no alternative in terms of accessibility and specialisation of services in the city area. At the same time, it is possible to point out the limit of the polycentric pattern of large-scale stores, where the absence of complementary functions (typical of a compact city) in a close proximity can pose a major problem in the physical accessibility of everyday goods in the event of the closure of a commercial centre.

Spatial inequities in the ability to use the services of retailers have been reinforced (albeit unconsciously) by the activities of central government, to varying degrees in different types of urban structure. In the absence of systematic retail planning at the urban (metropolitan) level, the established advantages of traditional compact urban structures complemented by

a polycentric arrangement of commercial functions are no longer valid. As a result of the changing specialisation and location of retail units, the urban structure itself is only one of the multiple factors to be considered when trying to improve the resilience of certain urban locations to unexpected crises. Here, there is also an opportunity for further research by projecting the socioeconomic or demographic status of the population in the localities concerned. Although it is clear that all customers may not always shop according to the same spatial and temporal strategies, the analysis has shown the existence of unreflected spatial discrimination, the spatial differentiation of which is derived from the spatial configuration of the retail network, the urban structure and the accessibility of central retail locations.

It is also clear that the rules set by the Czech government (as a central ruling authority) had to be primarily general and could not reflect the individual situation of each city. Our study showed that some inequalities could have been handled at the level of local decisions. However, necessary competencies were not devolved to local authorities. In light of the COVID-19 pandemic, a shift of competencies is something to be considered in the future. Nonetheless, the key prerequisite for reducing inequalities is a better knowledge of spatiotemporal logic of the territories concerned. This is a major challenge for urban policies that do promote evidence-based decision-making, but this capability is limited to medium- and long-term planning horizons and, as has been shown, not to short-term measures based on sudden crises.

## Acknowledgement

*This work was supported by the Czech Science Foundation (Compact and polycentric urban forms: Conflicting spatial imaginations?, 20-13713S). The authors are very thankful for this support. The authors declare no conflict of interest related to this research project or to the publication of their research findings resulting from this project.*

## References:

- Allam, Z., Bibri, S. E., Chabaud, D., & Moreno, C. (2022). The '15-Minute City' concept can shape a net-zero urban future. *Humanities and Social Sciences Communications*, 126(9), 1–5. <https://doi.org/10.1057/s41599-022-01145-0>
- Artmann, M., Inostroza, L., & Fan, P. (2019). Urban sprawl, compact urban development and green cities. How much do we know, how much do we agree?. *Ecological indicators*, 96(2), 3–9. <https://doi.org/10.1016/j.ecolind.2018.10.059>
- Ancell, S., & Thompson-Fawcett, M. (2008). The social sustainability of medium density housing: A conceptual model and christchurch case study. *Housing Studies*, 23(3), 423–442. <https://doi.org/10.1080/02673030802029990>
- Bailey, N., & Turok, I. (2001). Central Scotland as a polycentric urban region: useful planning concept or Chimera? *Urban Studies*, 38(4) 697–715. <https://doi.org/10.1080/00420980120035295>
- Belšán, E., & Niebauer, D. (2020). Constitutional Court complaint 867/2020. <https://www.senat.cz/dokumenty/pdf.php?id=eff346d340bcdbfec9450ba063339383>
- Berry, B. J. L. (1964). Cities as systems within systems of cities. *Papers of the Regional Science*, 13(1), 146–163. <https://doi.org/10.1007/BF01942566>
- Bohuslavová, R. (2020, November, 22). Blatný: Vánoce můžeme prožít ve stupni PES 3, tedy s otevřenými obchody a hospodami. *CNN Prima News*. <https://cnn.iprima.cz/blatny-vanoc-bychom-mohli-prozit-ve-stupni-pes-tri-13802>
- Boussauw, K., Neutens, T., & Witlox, F. (2012). Relationship between Spatial Proximity and Travel-to-Work Distance: The Effect of the Compact City. *Regional Studies*, 46(6), 687–706. <https://doi.org/10.1080/00343404.2010.522986>
- British Academy (2021). The Covid Decade: Understanding the Long-Term Societal Impacts of COVID-19. The British Academy. <https://www.thebritishacademy.ac.uk/publications/covid-decade-understanding-the-long-term-societal-impacts-of-covid-19/>

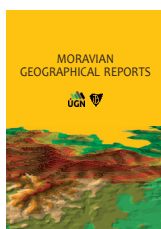
- Burton, E. (2000). The Compact City: Just or Just Compact?. A Preliminary Analysis. *Urban Studies*, 37(11), 1969–2006. <https://doi.org/10.1080/00420980050162184>
- Burton, E. (2002). Measuring urban compactness in UK towns and cities. *Environment and Planning B: Planning and Design*, 29(2), 219–250. <https://doi.org/10.1068/b2713>
- Carruthers, J. I., & Ulfarsson, G. F. (2003). Urban sprawl and the cost of public services. *Environment and Planning B: Planning and Design*, 30(4), 203–222. <https://doi.org/10.1068/b12847>
- Castells, M. (1996). *The Rise of the Network Society*. Blackwell.
- Christaller, W. (1933). *Die Zentralen Orte in Süddeutschland*. Gustav Fischer.
- Coe, N. M., & Hess, M. (2005). The internationalization of retailing: implications for supply network restructuring in East Asia and Eastern Europe. *Journal of Economic Geography*, 5, 449–473. <https://doi.org/10.1093/jeg/lbh068>
- Constitutional Court (2021). Announcement of the Constitutional Court Pl. ÚS 106/20. [https://www.usoud.cz/fileadmin/user\\_upload/Tiskova\\_mluvci/Publikovane\\_nalezky/2021/Pl.\\_US\\_106\\_20\\_vcetne\\_disentu.pdf](https://www.usoud.cz/fileadmin/user_upload/Tiskova_mluvci/Publikovane_nalezky/2021/Pl._US_106_20_vcetne_disentu.pdf)
- Couch, C., & Karecha, J. (2006). Controlling urban sprawl: Some experiences from Liverpool. *Cities*, 23(5), 353–363. <https://doi.org/10.1016/j.cities.2006.05.003>
- Data Brno (2021a). Brno Retail Research 2021 [Data set]. <https://datahub.brno.cz/datasets/pr%C5%AFzkum-maloobchodn%C3%ADs%C3%ADt%C4%9B-m%C4%9Bsta-brna-brno-retail-research-2021/explore?location=49.204119%2C16.592119%2C11.93>
- Data Brno (2021b). Number of people living at the addresses [Data set]. <https://data.brno.cz/datasets/mestobrnno::po%C4%8Det-osob-na-adresn%C3%ADch-m%C3%ADstech-number-of-people-living-at-the-adresses/about>
- Dempsey, N. (2010). Revisiting the Compact City?. *Built Environment*, 36(1), 4–8. <https://doi.org/10.2148/benv.36.1.5>
- Dieleman, F., & Wegener, M. (2004) Compact City and Urban Sprawl. *Built Environment*, 30(4), 308–323. <https://doi.org/10.2148/benv.30.4.308.57151>
- Drtina, T., & Krásný, T. (1989). Mezinárodní srovnání vývojových tendencí maloobchodní sítě. Výzkumný ústav obchodu.
- Ewing, R. (1997). Is Los Angeles-Style Sprawl Desirable?. *Journal of the American Planning Association*, 63(1), 107–126. <https://doi.org/10.1080/01944369708975728>
- Ewing, R., Schmid, T., Killingsworth, R., Zlot, A., & Raudenbush, S. (2003). Relationship between urban sprawl and physical activity, obesity, and morbidity. *American Journal of Health Promotion*, 18(1), 47–57. <https://doi.org/10.4278/0890-1171-18.1.47>
- Fernandes, J. R., & Chamusca, P. (2014). Urban policies, planning and retail resilience. *Cities*, 36, 170–177. <https://doi.org/10.1016/j.cities.2012.11.006>
- Garb, Y., & Dycicz, T. (2006). The retail revolution in post-socialist Central Europe and its lessons. In S. Tsenkova, & Nedović-Budić, Z. (Eds.), *The Urban Mosaic of Post-Socialist Europe*. Space, Institutions and Policy (pp. 231–252). Physica-Verlag HD.
- Giuliano, G. (1991). Subcenters in the Los Angeles region. *Regional Science and Urban Economics*, 21(2), 163–182. [https://doi.org/10.1016/0166-0462\(91\)90032-I](https://doi.org/10.1016/0166-0462(91)90032-I)
- Government of the Czech Republic (2020a). Crisis measure No. 1192. <https://www.vlada.cz/assets/media-centrum/aktualne/uv201116-1192.pdf>
- Government of the Czech Republic (2020b). Vláda prodloužila nouzový stav o dalších 30 dnů, přísnější opatření začnou platit od 27. prosince. <https://www.vlada.cz/cz/media-centrum/aktualne/vlada-prodlouzila-nouzovy-stav-o-dalsich-30-dnu--prisnejsi-opatreni-zacnou-platit-od-27--prosince-185809/>
- Government of the Czech Republic (2020c). Crisis measure of the Ministry of Health on sales hours for pensioner. <https://apps.odok.cz/attachment/-/down/IHOABMZAN3WR>
- Government of the Czech Republic (2022). Anti-epidemic measures. <https://www.vlada.cz/cz/epidemie-koronaviru/dulezite-informace/prehled-vladnich-usneseni-od-vyhlaseni-nouzoveho-stavu-180608/>
- Hall, P., & Pain, K. (2006). The Polycentric Metropolis: learning from mega-city regions in Europe. Earthscan.
- Hamidi, S., & Ewing, R. (2014). A longitudinal study of changes in urban sprawl between 2000 and 2010 in the United States. *Landscape and Urban Planning*, 128, 72–82. <https://doi.org/10.1016/j.landurbplan.2014.04.021>
- Hirt, S. (2013). Whatever happened to the (post)socialist city? *Cities*, 32, 29–38. <https://doi.org/10.1016/j.cities.2013.04.010>
- iRozhlas (2020a). Šéf Svazu obchodu a cestovního ruchu: Češi nechápou, proč si můžou koupit pušku, ale ne pastelky. iRozhlas. [https://www.irozhlas.cz/ekonomika/koronavirus-cesko-v-cesku-cr-obchody-nakupovani-nakupy-pravidla-opatreni\\_2012271839\\_ako](https://www.irozhlas.cz/ekonomika/koronavirus-cesko-v-cesku-cr-obchody-nakupovani-nakupy-pravidla-opatreni_2012271839_ako)
- iRozhlas (2020b). Prymula navrhne vláde, aby zrušila slevy v obchodech. Podle Babiše je potřeba akce ponechat. iRozhlas. [https://www.irozhlas.cz/zpravy-domov/ustredni-krizovy-stab-roman-prymula-zruseni-slevy-obchody-koronavirus-v-cesku\\_2003202133\\_aur](https://www.irozhlas.cz/zpravy-domov/ustredni-krizovy-stab-roman-prymula-zruseni-slevy-obchody-koronavirus-v-cesku_2003202133_aur)
- Johnson, M. P. (2001). Environmental impacts of urban sprawl: A survey of the literature and proposed research agenda. *Environment and Planning A*, 33(4), 717–735. <https://doi.org/10.1068/a3327>
- Kang-Rae, M., & Banister, D. (2007). Urban spatial change and excess commuting. *Environment and Planning A*, 39(3), 630–646. <https://doi.org/10.1068/a37441>
- Khavarian-Garmsir, A. R., Sharifi, A., & Sadeghi, A. (2023). The 15-minute city: Urban planning and design efforts toward creating sustainable neighbourhoods. *Cities*, 132, 104101. <https://doi.org/10.1016/j.cities.2022.104101>
- Kloosterman, R. C., & Lambregts, B. (2001). Clustering of economic activities in polycentric urban regions: the case of the Randstad. *Urban Studies*, 38(4), 717–732. <https://doi.org/10.1080/00420980120035303>
- Kluge, H. H. P. (2022). Statement: The European Region is in a “permacrisis” that stretches well beyond the pandemic, climate change and war. WHO. <https://www.who.int/europe/news/item/27-09-2022-statement-the-european-region-is-in-a-permacrisis-that-stretches-well-beyond-the-pandemic-climate-change-and-war>
- Krisp, J. M., & Špatenková, O. (2010). Kernel Density Estimations for Visual Analysis of Emergency Response Data. In M. Konečný, S. Zlatanová, & T. L. Bandrova (Eds.), *Geographic Information and Cartography for Risk and Crisis Management* (pp. 395–408). Springer-Verlag Berlin.
- Kučerová, T. (2020). Doba vyhrazená pro nákupy seniorů se zase mění. Nově bude od 8 do 10 hodin. iDNES. [https://www.idnes.cz/zpravy/domaci/vlada-oteviraci-doba-v-obchodech-pro-seniory-koronavirus.A200323\\_124237\\_domaci\\_kuce](https://www.idnes.cz/zpravy/domaci/vlada-oteviraci-doba-v-obchodech-pro-seniory-koronavirus.A200323_124237_domaci_kuce)
- Kunc, J., & Křižan, F. (2018). Changing European retail landscapes: New trends and challenges. *Moravian Geographical Reports*, 26(3), 150–159. <https://doi.org/10.2478/mgr-2018-0012>
- Kunc, J., & Křižan, F. (2022). Socio-economic challenges in retailing: past experience and future perspectives. In J. Kunc, F. Křižan, M. Novotná, K. Bilková, T. T. Sikos, D. Ilnicki, & R. Wyeth (Eds.), *Thirty Years of Retail Transformation in V4 Countries* (pp. 167–174). De Gruyter Poland.
- Kunc, J., & Novotná, M. (2022). The transformation of Czech retail. In J. Kunc, F. Křižan, M. Novotná, K. Bilková, T. T. Sikos, D. Ilnicki, & R. Wyeth (Eds.), *Thirty Years of Retail Transformation in V4 Countries* (pp. 15–51). De Gruyter Poland.
- Lang, R. E., Blakely, E. J., & Gough, M. Z. (2005). Keys to the New Metropolis: America's Big, Fastgrowing Suburban Counties. *Journal of the American Planning Association*, 71(4), 381–391. <https://doi.org/10.1080/01944360508976709>
- Malý, J. (2019). Polycentric Urban Systems and Territorial Cohesion. In E. Medeiros (Ed.), *Territorial Cohesion*. The Urban Book Series (pp. 68–89). Springer Nature Switzerland AG.
- Marino, M. D., Tomaz, E., Henriques, C., & Chavoshi, S. H. (2023). The 15-minute city concept and new working spaces: a planning perspective from Oslo and Lisbon. *European Planning Studies*, 31(3), 598–620. <https://doi.org/10.1080/09654313.2022.2082837>
- Maryáš, J., Kunc, J., Tonev, P., & Szczyrba, Z. (2014). Shopping and services related travel in the hinterland of Brno: changes from the socialist period to the present. *Moravian Geographical Reports*, 22(3), 18–28. <https://doi.org/10.2478/mgr-2014-0015>
- McMillen, D. P. (2001). Nonparametric employment subcenter identification. *Journal of Urban Economics*, 50(3), 448–473. <https://doi.org/10.1006/juec.2001.2228>
- Medeiros, E., & Rauhut, D. (2020). Territorial Cohesion Cities: a policy recipe for achieving Territorial Cohesion?. *Regional Studies*, 54(1), 120–128. <https://doi.org/10.1080/00343404.2018.1548764>
- Moreno, C., Allam, Z., Chabaud, D., Gall, C., & Pratlong, F. (2021). Introducing the “15-Minute City”: Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities. *Smart Cities*, 4(1), 93–111. <https://doi.org/10.3390/smartcities4010006>
- Mulíček, O., & Osman, R. (2018). Rhythm of urban retail landscapes: Shopping hours and the urban chronotopes. *Moravian Geographical Reports*, 26(1), 2–13. <https://doi.org/10.2478/mgr-2018-0001>

- MV ČR (2021). Decision on granting or not granting an exemption according to point XII. of the Government Resolution. MV ČR. <https://www.mvcr.cz/clanek/poskytnuti-informace-kopie-rozhodnuti-o-udeleni-resp-neudeleni-vyjimky-dle-bodu-xii-usneseni-vlady-ze-dne-26-2-2021-c-216-ve-zneni-usneseni-vlady-ze-dne-28-2-2021-c-218-vcetne-oduvodneni.aspx>
- Nguyen, D. (2010). Evidence of the impacts of urban sprawl on social capital. *Environment and Planning B: Planning and Design*, 37(4), 610–627. <https://doi.org/10.1068/b35120>
- Novinky.cz (2020). Změna: Senioři budou mít čas na nákup od 7 do 9 ráno. Novinky.cz. <https://www.novinky.cz/clanek/koronavirus-vlada-zrejme-zmeni-cas-na-nakup-pro-seniory-od-7-do-9-40317361>
- Nuissl, H., & Rink, D. (2005). The 'production' of urban sprawl in eastern Germany as a phenomenon of post-socialist transformation. *Cities*, 22(2), 123–134. <https://doi.org/10.1016/j.cities.2005.01.002>
- Olmouc regional public health authority (2020). Measure of General Nature No. KHSOC/09068/2020/RED. <https://www.olkraj.cz/download.html?id=73524>
- PES MZ ČR (2020). Anti-epidemic system of the Czech Republic. MZ ČR. <https://onemocneni-aktualne.mzcr.cz/pes>
- Pojani, E., Van Acker, V., & Pojani, D. (2018). Cars as a status symbol: Youth attitudes toward sustainable transport in a post-socialist city. *Transportation Research Part F: Traffic Psychology and Behaviour*, 58, 210–227. <https://doi.org/10.1016/j.trf.2018.06.003>
- Priporas, C. V., Stylos, N., & Fotiadis, A. K. (2017). Generation Z consumers' expectations of interactions in smart retailing: A future agenda. *Computers in Human Behavior*, 77, 374–381. <https://doi.org/10.1016/j.chb.2017.01.058>
- Pucher, J., & Buehler, R. (2005). *Transport policies in Central and Eastern Europe*. Rutgers University.
- Sassen, S. (2000). New frontiers facing urban sociology at the millennium. *British Journal of Sociology* 51(1), 143–159. <https://doi.org/10.1111/j.1468-4446.2000.00143.x>
- Seidenglanz, D., Kvizda, M., Nigrin, T., Tomeš, Z., & Dujka, J. (2016). Czechoslovak light rail – Legacy of socialist urbanism or opportunity for the future?. *Journal of Transport Geography*, 54, 414–429. <https://doi.org/10.1016/j.jtrangeo.2016.02.011>
- Sikos, T. T. (2022). The transformation of Hungarian retail. In J. Kunc, F. Križan, M. Novotná, K. Bilková, T. T. Sikos, D. Ilnicki, & R. Wyeth (Eds.), *Thirty Years of Retail Transformation in V4 Countries* (pp. 75–123). De Gruyter Poland. <https://doi.org/10.2478/9788367405065-004>
- Soja, E. (2010). *Seeking spatial justice*. University Of Minnesota Press.
- Spěváčková, M. (2020). Pernes: Nákazu sem zavlekli lyžaři. Seniorům jde o život, to není legrace. Seznam zprávy. <https://www.seznamzpravy.cz/clanek/pernes-nakazu-sem-zavlekli-lyzari-seniorum-jde-o-zivot-to-neni-legrace-95164>
- Spilková, J. (2012). The Birth of the Czech Mall Enthusiast: The Transition of Shopping Habits from Utilitarian to Leisure Shopping. *Geografie*, 117(1), 21–32. <https://doi.org/10.37040/geografie2012117010021>
- Stanilov, K., & Sýkora, L. (Eds.) (2014). *Confronting Suburbanisation: Urban Decentralization in Post-Socialist Central and Eastern Europe*. Wiley-Blackwell.
- Stone, B., Hess, J. J., & Frumkin, H. (2010). Urban form and extreme heat events: Are sprawling cities more vulnerable to climate change than compact cities?. *Environmental Health Perspectives*, 118(10), 1425–1428. <https://doi.org/10.1289/ehp.0901879>
- Szczyrba, Z. (2005). Maloobchod v ČR po roce 1989 – vývoj a trendy se zaměřením na geografickou organizaci. Univerzita Palackého.
- Szelenyi, I. (1996). Cities under socialism – and after. In G. Andrusz, M. Harloe, & I. Szelenyi (Eds.), *Cities after socialism: Urban and regional change and conflict in post-socialist societies* (pp. 286–317). Blackwell Publishers.
- Tauberová, D. (2020). Uničov a Litovel uzavřeli, lidé je nesmějí opustit. V karanténě je tam 1000 lidí. Deník. <https://www.denik.cz/regiony/unicov-litovel-uzavreni-karatena-koronavirus.html>
- UAP (2020). Territorial Analytical Documents of Brno. KAM. <https://upmb.brno.cz/uzemne-planovaci-podklady/uzemne-analyticke-podklady/>
- Vlčková, T. (2021). O výjimky pro cestování požádalo na 40 obcí, ta nejmenší v ČR ji nedostala. iDNES. [https://www.idnes.cz/zpravy/domaci/zakaz-cestovani-mezí-okresy-narizeni-ministerstvo-vnitro-obce-prejizdeni.A210304\\_132137\\_domaci\\_vlc](https://www.idnes.cz/zpravy/domaci/zakaz-cestovani-mezí-okresy-narizeni-ministerstvo-vnitro-obce-prejizdeni.A210304_132137_domaci_vlc)
- Zhang, W., Lu, D., Zhao, Y., Luo, X., & Jie, Y. (2021). Incorporating polycentric development and neighborhood life-circle planning for reducing driving in Beijing: Nonlinear and threshold analysis. *Cities*, 121, 103488. <https://doi.org/10.1016/j.cities.2021.103488>
- Zhu, J., & Guo, Y. (2022). Social justice in spatial change: transition from autonomous rural development to integrated urbanization in China. *Cities*, 122, 103539. <https://doi.org/10.1016/j.cities.2021.103539>

**Please cite this article as:**

Lichter, M., & Malý, J. (2023). Compact and polycentric urban forms as intertwined concepts: Learning from the impacts of Covid-19 retail restrictions on spatial (in)equalities in Brno (Czech Republic). *Moravian Geographical Reports*, 31(3), 129–140. <https://doi.org/10.2478/mgr-2023-0012>





# Geography of migration motives: Matching migration motives with socioeconomic data

Vladimír BALÁŽ<sup>a</sup> , Ivan LICHNER<sup>b</sup> , Tomáš JECK<sup>b\*</sup>

## Abstract

*Motives behind internal migration reported by internal migrants often differ from those assumed by standard economic and social theories. This research aims to narrow the gap between the stated motives and those suggested by human capital models. It relates the net migration rates by specific motives to socioeconomic and sociodemographic variables at the LAU 1 level in the period 1997–2021 in Slovakia. This research establishes that most of the stated motives behind internal migration (housing and family) differ from those assumed by human capital theories. This finding is valid for motives stated at the proximal level. The analysis of migration rates and housing supply indicates a substantial concentration of interdistrict migrants in suburban districts of affluent metropolitan regions. This finding resonates with assumptions on the latent importance of employment and income for internal migration.*

**Keywords:** internal migration, migration motives, metropolitan reason, suburbanisation

**Article history:** Received 11 February 2023, Accepted 7 September 2023, Published 30 September 2023

## 1. Introduction

Standard economic and social theories (Sjaastad, 1962; Harris & Todaro, 1970; Mincer, 1978; Stark & Bloom, 1985, Kennan & Walker, 2011) assume that internal migration is driven by job and income disparities between places of origin and destination. This has been empirically tested in several developed and developing countries (e.g. Borjas et al., 1992; Cebula, 2005; Phan & Coxhead, 2010). However, the migration motives that people cite when asked about their migration often differ from those suggested by social and economic theories (Morrison & Clark, 2011, 1948–1949). Employment and income-related reasons tend to motivate only a minority of the total moves in developed countries. This paper aims to close the gap between stated and actual migration motives. The research adopts a long-term perspective and relates the net migration rates to socioeconomic and sociodemographic variables at the LAU 1 level from 1997–2021 in Slovakia.

There is relatively rich research on internal migration and suburbanisation trends in post-socialist countries (Bezák, 2008; Lerch, 2014; Šveda et al., 2016; Spórna & Krzysztofik, 2020). Research on internal migration in Slovakia has explored unemployment and wage differentials (Janotka & Gazda, 2010; Michálek & Podolák, 2011; Ondoš and Káčerová, 2015) and regional clusters (Janotka et al., 2013). Relatively few studies have targeted the quantitative assessment of migration motives over the long term (but see Morrison & Clark, 2011; Thomas, 2019; Halás & Klapka, 2021). Most studies on internal migration adopt a cost-benefit framework and leave the gap between self-reported motives and actual socioeconomic and sociodemographic developments

unanswered. Research on the motives behind internal migration in countries of Central and Eastern Europe (CEE) is rather scarce, and our analysis attempts to fill this gap. To our knowledge, no study has compared self-reported motives with actual data.

## 2. Theoretical background

This chapter discusses two major theoretical approaches to internal migration, human capital and life course transition frameworks, and then it turns to the latent economics of migration motives. The research gap is identified, and hypotheses are formulated.

### 2.1 Human capital framework

Sjaastad's (1962) seminal paper on internal migration adopted the perspective of human capital and considered internal migrants to be utility maximisers. Human capital models of internal migration are based on arbitrage decisions between labour markets. An internal migrant moves if the net discounted expected returns on his or her human capital accumulated in the place of destination surpass those in the place of origin. While Sjaastad (1962, 65) also acknowledged the 'psychic' (nonmonetary) costs of migration (related to leaving family and familiar surroundings), most attention in migration research was given to the elicitation of monetary costs and benefits (Harris & Todaro, 1970). The 'new economics of labour migration' (Mincer, 1978; Stark & Bloom, 1985) later argued that migration decisions are often made at the family level rather than the individual level and extended assumptions on cost-benefit maximisation to the family

<sup>a</sup> Institute for Forecasting, Centre of Social and Psychological Sciences, Slovak Academy of Sciences, Bratislava, Slovakia

<sup>b</sup> Institute of Economic Research, Slovak Academy of Sciences, Bratislava, Slovakia (\*corresponding author: T. Jeck, e-mail: [tomas.jeck@savba.sk](mailto:tomas.jeck@savba.sk))

level. Spatial differences in wages, employment and unemployment remained central in the literature on the economics of internal migration in developing and developed countries (Lucas, 1997, 735; Kennan & Walker, 2011, 246; Jia et al., 2023, 17).

While the human capital model is a powerful analytical tool for studies on labour economics, it 'does not provide a comparably powerful explanation of migration' (Greenwood, 1997, 647). In developed countries, reported motives mostly revolve around housing (i.e. housing availability, cost and quality), family and social affairs, and health and study reasons, while economic motives seem to be of lesser importance (Lundholm et al., 2004, 65; Clark & Huang, 2004, 625; Nedomysl & Amcoff, 2011, 662; Morrison & Clark, 2011, 1955; Clark & Mass, 2015, 59). There are several explanations for this apparent contradiction.

The first explanation refers to Sjaastad's nonmonetary costs and returns on internal migration. Returns on internal migration go beyond those related to income. For example, there is some evidence that residential relocation has a strong and enduring positive effect on housing satisfaction in comparison to overall life satisfaction (Nowok & McCollum, 2018).

## 2.2 Life course transition framework

The second explanation points to different migration motives over a life course. The life course framework has gained importance since the 1990s. The framework has benefited from better availability of longitudinal data (Vidal & Huinink, 2019, 596). The 'sociology of internal migration' explores relations between place, family ties and mobility over the life trajectory. The life course transition employs individual biographies to link spatial trajectories to major demographic events, such as birth, study, work, union formation/dissolution and retirement (Bailey, 2009, 408). An individual considers subjective opportunity differentials between the current and alternative places of living. The decisions to migrate are also informed by the influences of 'significant others' and available resources for migration (Kley, 2010, 469).

Migration is highly age-selective. Age-dependent migration patterns are connected to specific life transitions such as study, job search/change, marriage, and/or childbirth. The highest migration propensities are typical for young adults. These propensities decline rapidly in the later stages of life. If the first migration move is completed in later adulthood, the chances of repeated migration are significantly reduced (Bernard, 2017). Migration motives may change over time and follow important life course transitions. While obtaining education, employment, and independent housing is very important for young and educated adults (Thomas, 2019, 9), living with family and friends gains importance in the later stages of life (Coulter & Scott, 2015, 367). Internal moves, of course, can be informed by multiple considerations, of which family emerges as important (in either the first or second place) (Gillespie et al., 2021). Causal relations between marriage, births, divorce and internal migration are subject to debate (Cooke, 2008, 260), but family events tend to be critical predictors of migration rather than vice versa (Vidal & Huinink, 2019, 596). There is some evidence on the timing of marriage and the purchase of jointly owned housing (Holland, 2012). Birth of a child increases demand for better housing, but people with somewhat older children are less likely to move, especially over longer distances (Dommermuth & Klüsener, 2019, 14). The first move tends to have a low impact on divorce, but repeated migrations, especially over long distances, are stressful, disrupt social networks and increase the risk of divorce (Boyle et al., 2008, 218).

The human capital approach states economic motives for internal migration in simple terms of employment and income. The life course framework acknowledges economic motives in a subtler manner. It accentuates the importance of age, space,

family and social networks in mobility decisions. Economic motives dominate in long-distance migration, while noneconomic motives (habitation, environment, family) prevail in short-distance moves (Biagi et al., 2011, 123; Halás & Klapka, 2021, 7). Long-distance migrants may achieve career advancement and higher income but lose support from local social networks and incur 'psychic' (nonmonetary) costs of migration (Sjaastad, 1962). Stayers are more likely to benefit from material and emotional support by family and friends. Housing decisions are informed by upward moves on the housing ladder but also by cost considerations (Vidal & Huinink, 2019, 597). Young families move from metropolitan to suburban areas to look for a desirable lifestyle and cheaper and larger housing (Sandow & Lundholm, 2020, 286).

The life course framework acknowledges changing family dynamics in internal migration. An increase in the share of single-person households, a decrease in fertility (Šprocha et al., 2022), and more complex and more fluid household structures, for example, enhance short-distance and circular migration (Green, 2018). Changes in age composition, regional inequalities (Alvarez et al., 2021, 14), the structure of labour markets, and behavioural change (e.g. increased place attachment), for example, rank as the most important factors behind a decline in the intensity of internal migration in developed countries (Kalembe et al., 2022, 303).

## 2.3 Latent economics of migration motives

The third explanation distinguishes between stated (proximal) and latent migration motives. The discrepancy between self-reported motives and those assumed by social and economic theories does not mean that job and income motives are irrelevant for internal migration. The working-age population accounts for the vast majority of moves. It is problematic to move to any destination if there is no source of income. Acceptable employment or income is a necessary enabling condition for any move and must be addressed beforehand. Migrants may report other proximate reasons for their moves (such as housing or family), but new or continuing employment (income) is a latent variable behind a substantial portion of internal migration. Morrison and Clark (2011) suggested that there is a difference between employment as an enhancing versus enabling factor of internal migration. Enhancing motives refer to a desire to increase net income from employment, while enabling motives refer to the aim to secure acceptable income. In fact, employment and income motives account for only a fraction of moves by the working-age population, including those in countries with substantial regional disparities. There is indeed some evidence that only a minority of migrants (i.e. those with higher education) are able to capture large monetary returns from internal migration, while the majority of migrants end up with low or negative gains (Morrison & Clark, 2011, 1956; Korpi & Clark, 2015, 34). Job-related moves need not necessarily aim at increases in net income. Motivations behind a job change may include higher job satisfaction and/or improved working conditions and environments. The three explanations are complementary, rather than exclusive.

## 2.4 Research hypotheses

The theoretical framework and literature review suggested the following hypotheses:

- Hypothesis 1: Stated migration motives correlate well with actual socioeconomic and sociodemographic developments.
- Hypothesis 2: The availability of jobs is a latent variable behind most migration moves.

## 3. Data and methods

Most data on migration motives in developed countries come from panels (Coulter & Scott, 2015; Thomas et al., 2019) and/or ad hoc surveys (Morrison & Clark, 2011; Nedomysl & Amcoff, 2011;

Dommermuth & Klüsener, 2019; Gillespie et al., 2021). Panel- and survey-based studies may design and test their own hypotheses. The surveys may be more or less representative of the total population and diverse time periods.

Data on internal moves come from population registers in Slovakia. Each person changing his or her permanent residence completes a short questionnaire with a local authority in the migration destination. Internal migrants can choose from the following nine reasons for moving to and from a specific district: (1) job change, (2) job proximity, (3) study, (4) health, (5) marriage, (6) divorce, (7) housing, (8) following family/relatives, and (9) other reasons. The person indicates only one key reason for the move. Open text is not allowed. The system of migration records established in the communist period has changed little until the present. The current Slovak Law on Populations Registry (No. 253/1998) transposed provisions of the 135/1982 Law on Registries. The provisions set that the head of household can register all other household members. The motive 'following family/relatives' is recorded automatically for all children up to age 15.

The Statistical Office of the Slovak Republic (SOSR, 2023) processes administrative records and publishes annual datasets on internal migration. The complete data matrix accounts for a zero balance — the total number of internal emigrants equals the total number of immigrants. The database contains records on all 2,648,132 (intra- and interdistrict) changes in permanent residence in the period 1992–2021 in Slovakia. This research covers all 1,110,417 between-district changes in permanent residence in the period 1997–2021. Complete and long-term records are the obvious advantage of the dataset. The SOSR, unfortunately, does not allow access to microdata on internal migrants. The major drawback of the administrative data is that the moves are recorded only after the permanent residence is changed. The actual move may have been completed before, e.g. after the certain period of studying and/or living in the destination region (see Halás & Klapka, 2021, 4 for more details).

The research examines interdistrict migration to associate the effects of migration with trends in regional polarisation. The net migration rate (per 1,000 population) at the district level is the dependent variable in this research.

A new territorial structure was established in Slovakia in 1996. The country was divided into eight NUTS 3-level regions and 79 LAU 1 (NUTS 4) districts. An analysis of internal migration is performed at the district (LAU 1) level, as this is the most detailed spatial level at which relevant socioeconomic and sociodemographic data are available. The 1997 district-level data have already been used in migration studies in Slovakia (Janotka & Gazda, 2010; Janotka et al., 2013; Michálek & Podolák, 2011; Ondoš & Káčerová, 2015).

To verify the robustness of the results, internal migration flows are specified for two types of spatial structures. The first structure considers all 79 administrative districts. The second structure follows the methodology of the OECD (2012, 23) and Ženka et al. (2021, 6) and comprises 70 territorial units. It aggregates five Bratislava City districts and four Košice City districts into the

respective metropolitan core districts. The districts surrounding Bratislava city (i.e. Pezinok, Malacky and Senec) and the Košice-okolie district are considered hinterlands of metropolitan areas. All other districts are considered nonmetropolitan areas.

This research analyses migration motives recorded in population registers. The motives refer to specific life course transitions, such as employment, marital status, housing, and family formation/dissolution (Cooke, 2008; Bailey, 2009; Vidal & Huinink, 2019). The motives are approximated by respective socioeconomic and sociodemographic variables, such as unemployment rates, the construction of new flats, and marriage, divorce and birth rates.

Slovakia accounts for vast west–east disparities in terms of employment, income, infrastructure endowments, and the quality of public services (Halás, 2014). These disparities are approximated via the distance of individual districts from the capital city of Bratislava. The important role of the capital city in internal migration processes was also identified in the works of Dennett and Wilson (2013) and Rowe and Patias (2020). Study and health motives could be quite heterogeneous for specific individuals and regions. These two motives also proved to be marginal for the total net migration rate. We use the urbanisation rate as a crude proxy for study motives, as higher education institutions tend to concentrate in urban areas. No proxy was used for the 'other' migration motive.

The road distance<sup>1</sup> from district capitals to Bratislava is a proxy for the distance variable. The data for independent variables come from the SOSR (2023) 'Demography and Social Statistics' and are available from the online DataCube database. All demographic variables are computed for the mid-year population. The data on new flats refer to all types of housing (after final building approval)<sup>2</sup>. Unemployment is a key determinant of internal migration in Harris and Todaro's (1970) seminal paper. There is some evidence on the importance of the unemployment rate for internal migration in Slovakia (Gazda & Novotný, 2014, 6). Unemployment rates in the district accounted for much higher disparities than wages. The variation coefficient for unemployment rates, for example, was 47.43% for unemployment rates but 19.72% for wages in 1997–2008<sup>3</sup>.

Data were provided for the period 1997–2021. This long period of 25 years accounted for some important changes in the Slovak economy, as well as societal and demographic developments. As shown in the next chapter, these changes also impacted patterns of internal migration. We therefore divide the period 1997–2021 into two subperiods: 1997–2008 and 2009–2021. The first subperiod presented profound structural and socioeconomic changes, such as market reforms, the integration of Slovakia into the European Union and global trade networks, a high influx of foreign direct investment, and high rates of economic growth but also high unemployment rates. The period ended with the abrupt onset of a global financial and economic crisis in 2008. The second period presented postcrisis adjustments and lower rates of economic growth but also generally lower unemployment rates.

Correlation, factor and regression analyses were employed to examine the relationships between self-reported migration motives and actual changes in the net migration rates.

<sup>1</sup> Bačík, V. (2023): available at: [www.sodbtn.sk/obce](http://www.sodbtn.sk/obce)

<sup>2</sup> Many internal moves are informed by housing prices. Housing price statistics, unfortunately, are available only from 2007 on the NUTS 3 level in Slovakia.

<sup>3</sup> We considered some alternative variables for drivers of internal migration, such as job vacancies and wages. The Pearson correlation coefficients were –0.107 and 0.112 (both insignificant) for 1997–2008 and 2009–2021, respectively. Data on job vacancies are rather less reliable than those on unemployment. Not all employers provide accurate data on vacancies. Income disparities are underreported as well. Some sectors (construction, gastronomy) typically have low/minimum wages, but many workers collect undeclared cash payments. Data on unemployment are more representative than data on vacancies and wages. Unemployed individuals are motivated to register with the local labour office and collect unemployment and social benefits.

First, we examine correlations between individual (stated) migration motives to determine to what degree these motives are distinctive or interchangeable. In the second step, the net migration rates are correlated with specific socioeconomic variables. To address substantial multicollinearity, the socioeconomic variables are merged into a lower number of meaningful factors (Joliffe & Morgan, 1992) and then examined via regression analysis in the third step of analysis.

## 4. Results

### 4.1 Descriptive analysis

Figures 1 and 2 present some important trends in internal migration in Slovakia in the period 1997–2021. Several findings stand out.

Internal migration intensity and structure (inter- versus intra-district) were generally stable over the whole period (see Fig. 1). The intensities of intra- and inter-district migration comoved and reacted in response to the same types of events. There were some notable but temporary declines in migration intensities: economic downturns in 1999–2001 and 2009 and the 2020 wave of the COVID-19 pandemic. Furthermore, there was an increase in migration associated with periods of economic booms (2002–2008, 2014–2019).

While the overall intensity of migration changed little, there were substantial changes in the composition of migration motives:

- Housing and family-related motives were by far the most important out of the total set of motives. These respective motives were reported by 32.4% and 27.4% of internal immigrants in 1997–2008 and 31.8% and 25.6% in 2009–2021. This finding is consistent with the high shares of housing and family-related motives reported by internal migrants in developed countries (Coulter & Scott, 2015; Nowok, 2018). The ‘other’ migration motives significantly increased in importance. They accounted for 19.0% of the total motives in 1997–2008 but 24.4% in 2009–2021.
- Migrants aged 20–64 years accounted for 68.4% and 69.9% of the total interdistrict migrants in the periods 1997–2008 and 2009–2021, respectively. Job change and job proximity, however, accounted for a low and declining weight in the overall structure of migration motives (see Fig. 2). This finding is consistent with findings from other OECD countries (Morrisson & Clark, 2011). We assume that the low weight of job-related motives is obscured by the difference between

the enabling and enhancing roles of employment and income in total migration flows. The declining shares of job-related motives may also refer to the increasing age of internal migrants. The average age of internal migrants increased by approximately three years in the period 1997–2021. Some important life course transitions (including job change) are related to young age. With increasing age, the probability of job-motivated migration decreases. Profound changes in the Slovak labour market may also have impacted job-related migration. Unemployment rates peaked in 1999–2002 in Slovakia. Later years (including the postcrisis period) presented much lower unemployment rates. Job and income considerations therefore were of lower importance for internal migrants in the 2020s than in the 1990s.

- Marriage and divorce motives were frequently mentioned in the 1990s but decreased in importance over time. Health and study motives were rarely reported over the whole period.

Correlation, factor and regression analyses were performed for two spatial structures (see Appendixes 1 and 2). We first present findings related to the structure with 79 districts in sections 4.2, 4.3 and 4.4. Section 4.5 discusses findings for the structure with 70 spatial units.

### 4.2 Correlation analysis

We perform two types of correlation analysis. The first analysis examines how much specific migration motives are similar (and potentially interchangeable) or disparate. The second analysis explores simple correlations between, on the one hand, reported

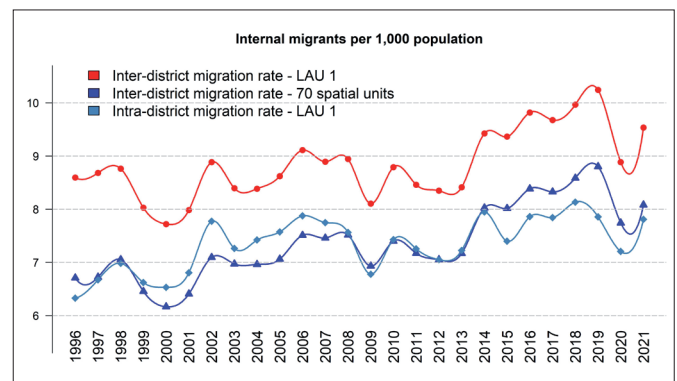


Fig. 1: Intensity of internal migration in Slovakia in 1997–2021  
Source: authors, based on SOSR (2023) data

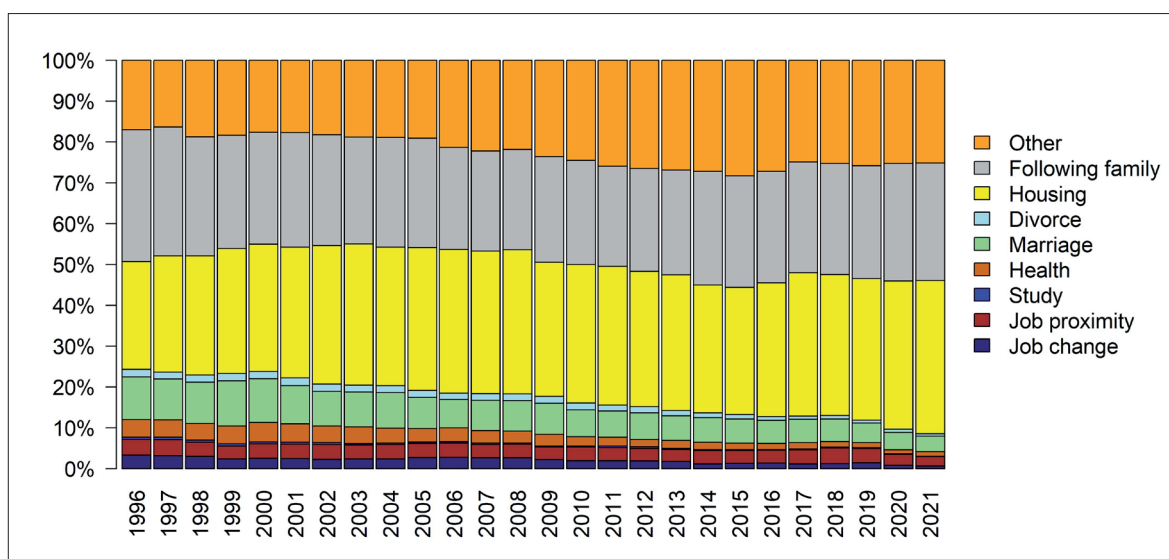


Fig. 2: Stated motives for internal migration in Slovakia in 1997–2021 in 79 districts  
Source: authors, based on SOSR (2023) data

migration motives and, on the other hand, actual data on socioeconomic and sociodemographic developments. This analysis helps identify common underlying factors behind migration developments. Furthermore, it points to the complex nature of relations between individual socioeconomic and sociodemographic variables as well as risks (and ways of mitigation) by multicollinearity.

#### 4.2.1 Correlations by reported migration motives

Some reported motives were highly correlated (Tab. 1). Job change, job proximity, and marriage-driven moves, for example, generated correlation coefficients in the range of 0.7–0.9 from 1997–2008 and 2009–2021. A suggested explanation is that if the members of a couple came from different regions, one member tended to move to (and find a job in) the region of his or her spouse. Housing and family motives were also highly correlated (Pearson correlation above 0.84 in both subperiods). The finding is rather unsurprising, as the motive to ‘following family/relatives’ is automatically recorded for children up to the age of 15. Accompanying children accounted for 20.4% of total internal migrants in 1997–2008 and 21.1% in 2009–2021.

The correlations between, on the one hand, job change and job proximity and, on the other hand, housing and family motives were medium-low and negative in 1997–2008 but positive and medium-high in 2009–2021. A potential explanation points to the changing geography of migration motives between the two time periods. Positive net migration rates for job-related motives were typical for metropolitan core and metropolitan-hinterland districts (as well as for county capitals) in both time periods. The metropolitan core areas entailed expensive housing and, in some cases, negative migration rates related to housing and family motives. Approximately half of the Slovak districts showed positive net migration rates for housing and family-related motives in 1997–2008, but quite a few did so in 2009–2021. Housing and family-related net migration rates were mostly found in the hinterlands of metropolitan core areas. This finding is supported by the results of the regression analysis. It gives some support to the assumption of theories on life course transition (Vidal & Huinink, 2019; Holland, 2012) but needs further verification.

Study-related motives were highly correlated with job proximity from 1997–2008 but not from 2009–2021. The finding may be related to the high shares of tertiary-educated people in the total population

and the availability of higher education institutions across Slovak regions in the period 2009–2021. Assumptions on the study-related motives must be observed with caution, as their share in total stated motives was quite low (Fig. 2). Moves related to health and ‘other’ reasons seemed to be quite diverse, as they generated dissimilar and mostly medium-low correlation coefficients in both subperiods. We found no unambiguous proxy for this migration motive.

#### 4.2.2 Correlation by socioeconomic and sociodemographic variables and net migration rates

The second correlation analysis suggested that some migration motives were well correlated with actual data on socioeconomic and sociodemographic variables. Housing availability (approximated via the number of new flats per 1,000 population) accounted for the highest correlation with the total net migration rate. Housing availability was contingent on the unemployment rate and the distance of a district from Bratislava. The correlations pointed to vast regional disparities between developed western (particularly Bratislava) and poor eastern parts of Slovakia.

The marriage rate was correlated with (live) births but not with the unemployment rate. This is interesting, as job- and marriage-related motives proved to be highly correlated. The live birth rate (Dommermuth & Klüsener, 2019) accounted for different developments in the periods 1997–2008 and 2009–2021. In the former period, high birth rates were associated with poor regions in the eastern part of Slovakia with high unemployment rates. The association no longer held in the later period. Increased birth rates were also found in rural hinterlands of the cities of Bratislava and Košice. This development is explained via substantial immigration by young families to the suburban districts of Senec (SC), Pezinok (PK), Malacky (MA), and Košice-okolie (KS). Birth rates and marriage rates weakly correlated with the net migration rate. We assume that marriage and live births impacted net migration rates indirectly via an increased demand for new housing (Holland, 2012; Dommermuth & Klüsener, 2019).

Interestingly, the correlation between the divorce rate and the net migration rate was low and insignificant from 1997–2008 but proved to be positive, medium-sized and highly significant from 2009–2021. Correlation is not causation. Boyle et al. (2008) suggested that long-distance migration increases the probability of divorce, but we cannot tell whether the increased numbers of divorces transferred into higher migration rates or vice versa.

	Job change	Job proximity	Study	Health	Marriage	Divorce	Housing	Following family	Other
1997–2008									
Job change	1								
Job proximity	<b>0.926**</b>	1							
Study	<b>0.822**</b>	<b>0.848**</b>	1						
Health	–0.111	–0.183	–0.233*	1					
Marriage	<b>0.712**</b>	<b>0.821**</b>	<b>0.700**</b>	–0.242*	1				
Divorce	–0.140	–0.077	0.054	–0.113	0.295**	1			
Housing	–0.261*	–0.268*	–0.417**	0.174	–0.023	0.304**	1		
Following family	–0.374**	–0.418**	–0.492**	0.119	–0.135	0.224*	0.840**	1	
Other	–0.105	–0.072	–0.146	–0.143	0.283*	0.553**	0.601**	0.492**	1
2009–2021									
Job change	1								
Job proximity	<b>0.846**</b>	1							
Study	0.365**	0.360**	1						
Health	0.436**	0.301**	0.135	1					
Marriage	<b>0.802**</b>	<b>0.901**</b>	0.370**	0.337**	1				
Divorce	<b>0.679**</b>	<b>0.514**</b>	0.100	0.351**	<b>0.520**</b>	1			
Housing	<b>0.670**</b>	0.440**	0.316**	0.432**	0.436**	0.315**	1		
Following family	0.491**	0.291**	0.285*	0.289**	0.257*	0.130	<b>0.847**</b>	1	
Other	0.278*	0.389**	0.450**	0.017	0.288*	–0.164	0.040	0.301**	1

Tab. 1: Correlation matrix for migration motives

Source: authors' computations based on SOSR (2023) data. Notes: \*\*significant at the 0.01 level; \*significant at the 0.05 level. Correlations above 0.5 are in bold

### 4.3 Factor analysis

Multicollinearity is a common problem in social and economic research. The correlation matrix (Tab. 2), for example, indicates high correlations between, on the one hand, a district's distance from Bratislava and, on the other hand, the unemployment rate, divorce rate, and housing construction. We found several independent variables with correlation coefficients higher than 0.6 (and significant at the 0.01 level). Factor analysis alleviates issues surrounding multicollinearity. Factor analysis helps by reducing a high number of independent variables to a lower number of factors. The factor analysis reduced the aforementioned seven independent variables to three factors (Tab. 3).

Three factors were established for the period 1997–2008. Factor 1 ('metropolitan region') included variables on the distance from Bratislava, unemployment rates, and new flats. Factor 2 ('young families') included marriage and live birth rates. Factor 3 ('urban region') included the urban population rate and divorce

rate. Similar factors were also established for the period 2009–2021. These factors had a quite similar composition in the period, except that the variable on the divorce rate transferred to Factor 1. All three factors had high factor loadings (Tab. 3). Moreover, the three factors explained 86.18% of the total variance in the period 1997–2008 and 85.38% in the period 2009–2021.

### 4.4 Regression analysis

The factor scores for Factors 1, 2 and 3 were the explanatory variables in the ordinary least squares regression model to explain the variability in the net migration rates (Tab. 4).

All three factors proved to be highly significant:

- Factor 1 had a negative sign from 1997–2008 but a positive sign from 2009–2021. The change refers to a reversal in the migration rate in the city of Bratislava between the two periods and a substantial decrease in unemployment rates in regions away from the capital region.

	Net migration rate	Distance to Bratislava (km)	Urban population (%)	Unemployment rate (%)	Marriage rate	Divorce rate	Live birth rate	New flats
1997–2008								
Net migration rate	1							
Distance to Bratislava (km)	–0.380**	1						
Urban population (%)	–0.336**	–0.209	1					
Unemployment rate (%)	–0.163	<b>0.654**</b>	– <b>0.518**</b>	1				
Marriage rate	–0.244*	0.232*	0.167	–0.181	1			
Divorce rate	0.097	– <b>0.538**</b>	<b>0.605**</b>	–0.340**	–0.368**	1		
Live birth rate	–0.104	<b>0.617**</b>	–0.417**	<b>0.511**</b>	<b>0.507**</b>	– <b>0.679**</b>	1	
New flats	<b>0.640**</b>	– <b>0.514**</b>	0.131	– <b>0.604**</b>	0.224*	0.120	–0.133	1
2009–2021								
Net migration rate	1							
Distance to Bratislava (km)	–0.452**	1						
Urban population (%)	–0.034	–0.209	1					
Unemployment rate (%)	–0.324**	<b>0.683**</b>	–0.462**	1				
Marriage rate	0.081	0.036	0.270*	–0.228*	1			
Divorce rate	0.459**	– <b>0.717**</b>	0.455**	– <b>0.552**</b>	–0.293**	1		
Live birth rate	0.226*	0.182	–0.130	0.211	<b>0.609**</b>	–0.401**	1	
New flats	<b>0.896**</b>	– <b>0.574**</b>	0.112	– <b>0.549**</b>	0.304**	0.492**	0.284*	1

Tab. 2: Correlation matrix for migration motives and socioeconomic variables

Source: authors' computations based on SOSR (2023) data

Notes: marriage rate, divorce rate, live birth rate, and new flats are stated per 1,000 population. Share of population in municipalities with 5,000+ population was proxy for urbanisation rates; \*\* significant at the 0.01 level; \* significant at the 0.05 level. Correlations above 0.5 are in bold.

1997–2008			
Component (% of the total variance)	1 (31.30%)	2 (28.18%)	3 (26.70%)
New flats per 1,000 population	– <b>0.897</b>	0.137	–0.028
Unemployment rate (%)	<b>0.800</b>	0.005	–0.455
Distance to Bratislava	<b>0.759</b>	0.496	–0.166
Marriage rate per 1,000 population	–0.181	<b>0.922</b>	0.146
Live birth rate per 1,000 population	0.312	<b>0.725</b>	–0.466
Urban population (%)	–0.121	0.065	<b>0.962</b>
Divorce rate per 1,000 population	–0.158	–0.572	<b>0.684</b>
2009–2021			
Component (% of the total variance)	1 (38.10%)	2 (27.46%)	3 (19.82%)
Distance to Bratislava	– <b>0.895</b>	0.141	–0.087
New flats per 1,000 population	<b>0.844</b>	0.388	–0.073
Divorce rate per 1,000 population	<b>0.763</b>	–0.423	0.294
Unemployment rate (%)	– <b>0.736</b>	–0.025	–0.477
Live birth rate per 1,000 population	–0.059	<b>0.889</b>	–0.231
Marriage rate per 1,000 population	0.021	<b>0.884</b>	0.340
Urban population (%)	0.159	0.017	<b>0.944</b>

Tab. 3: Rotated Component Matrix

Source: authors' computations based on the SOSR (2023) data

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation

	Unstandardised coefficients		Standardised coefficients	t	Sig.
	B	Std. error	Beta		
<i>1997–2008; adjusted R-squared = 0.515; F = 28.636, sig. 0.000</i>					
(Constant)	-0.175	0.226		-0.776	0.440
F1 (flats, distance, unemployment)	-1.583	0.227	-0.549	-6.962	<b>0.000</b>
F2 (marriage, live births)	-0.750	0.227	-0.260	-3.298	<b>0.001</b>
F3 (urban population, divorce)	-1.172	0.227	-0.406	-5.154	<b>0.000</b>
<i>2009–2021; adjusted R-squared = 0.640; F = 47.177, sig. 0.000</i>					
(Constant)	-0.478	0.317		-1.506	0.136
F1 (flats, distance, unemployment, divorce)	3.442	0.319	0.732	10.776	<b>0.000</b>
F2 (marriage, live births)	1.119	0.319	0.238	3.505	<b>0.001</b>
F3 (urban population)	-1.157	0.319	-0.246	-3.623	<b>0.001</b>

Tab. 4: OLS regression (variables significant at the 0.001 level are in bold)  
Source: authors' computations based on SOSR data

- Factor 2 showed a negative sign from 1997–2008 but a positive sign from 2009–2021. The change reflects an increase in marriage and birth rates in the cities of Bratislava and Košice as well as a transition from a negative to a positive migration rate in the city of Bratislava from 2009–2021 in comparison to 1997–2008.
- Factor 3 had a negative sign in both subperiods. The negative sign is explained by very high and positive migration rates in five suburban districts of the cities of Bratislava and Košice (Senec, Pezinok, Malacky, Dunajská Streda, and Košice-okolie)<sup>4</sup>.

High values of R-squared indicate a good match between the net migration rates (coming from self-reported motives) and explanatory socioeconomic and sociodemographic factors (supporting Hypothesis 1).

High values of the standardised beta coefficients for Factor 1 ('metropolitan region'; -0.549 and 0.732 for 1997–2008 and 2009–2021) indicate that this factor was by far more important for the total migration rate than were Factors 2 and 3. The OLS regression tells the story of extreme regional polarisation and massive suburbanisation in the capital city of Bratislava and (to a much lower degree) in the city of Košice. Figure 3 (upper panel) displays net migration rates for 79 Slovak districts. Positive rates are depicted in blue, while negative rates are displayed in red. There was an apparent trend in the concentration of positive migration rates around suburbs of the cities of Bratislava and Košice, and the polarisation became more extreme over time. Some 37 districts (out of 79 in total) accounted for a positive migration rate from 1997–2008, but only 21 did in the period 2009–2021. Moreover, the five suburban districts comprised 54.9% and 63.4%

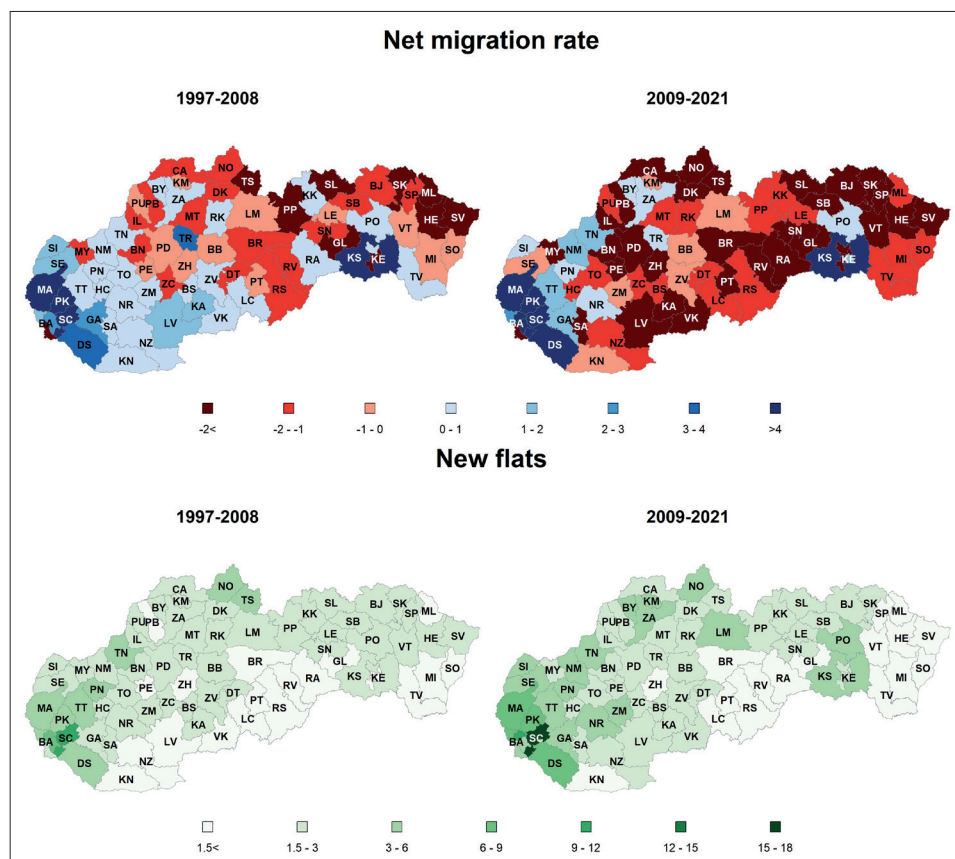


Fig. 3: Net rates of internal migration and new flats (per 1,000 population) in Slovakia in 1997–2021. Source: authors

<sup>4</sup> A complete list of Slovak districts, their official codes, and information on area and population can be found here: <http://www.statoids.com/ysk.html>

of all migration gains in 1997–2008 and 2009–2021, respectively. The respective shares of total new flats represented by the five suburban districts were 14.5% and 21.3% (Fig. 3, bottom panel). While the capital region of Bratislava and its suburban districts enjoyed an influx of migrants, the rest of the country accounted for significant population outflows (with the notable exception of the suburban Košice-okolie district). Patterns of explosive growth in uncontrolled suburbanisation are typical for many post-socialist countries (Sýkora & Stanilov, 2014).

Job-related motives accounted for a minority of the stated total migration moves, but districts with positive net migration rates largely overlapped with those typically presenting below-average unemployment rates. The poorest Slovak regions, on the other hand, had high negative migration rates. The finding gives some credit to Hypothesis 2. This finding is also in agreement with that of Morrisson and Clark (2011). There is a difference between the enabling and enhancing roles of employment in internal migration. People aged below 44 accounted for 82.1% of the total internal migrants from 1997–2021 in Slovakia. We argue that continuing employment was an enabler and latent factor behind

most migration moves. Negative migration rates, for example, were found for the city of Bratislava from 1997–2008 and for the city of Košice from both 1997–2008 and 2009–2021. A negative rate did not mean that inhabitants were leaving their jobs in these cities. The migrants simply looked for cheaper and better-quality housing. This assumption is supported by developments in migration rates to/from Bratislava city districts. Major migration losses were related to the Bratislava 5 (Petržalka) district, while the highest gains were related to the Bratislava 3 (Ružinov) district in both subperiods. Population flight to suburban areas as well as differences in the migration rates among Bratislava city districts indicate that the moves were motivated by improvements in housing consumption. The housing consumption motive, of course, was enabled by the availability of jobs and income in metropolitan areas. This finding is consistent with those from other post-socialist countries (see, for example, Krisjane & Berzins, 2012, 302; Spórna & Krzysztofik, 2020, 12; Šveda et al., 2016) and resonates with assumptions of the life course transition framework.

Job and marriage-related motives clearly dominated in the metropolitan areas of Bratislava and Košice, particularly in

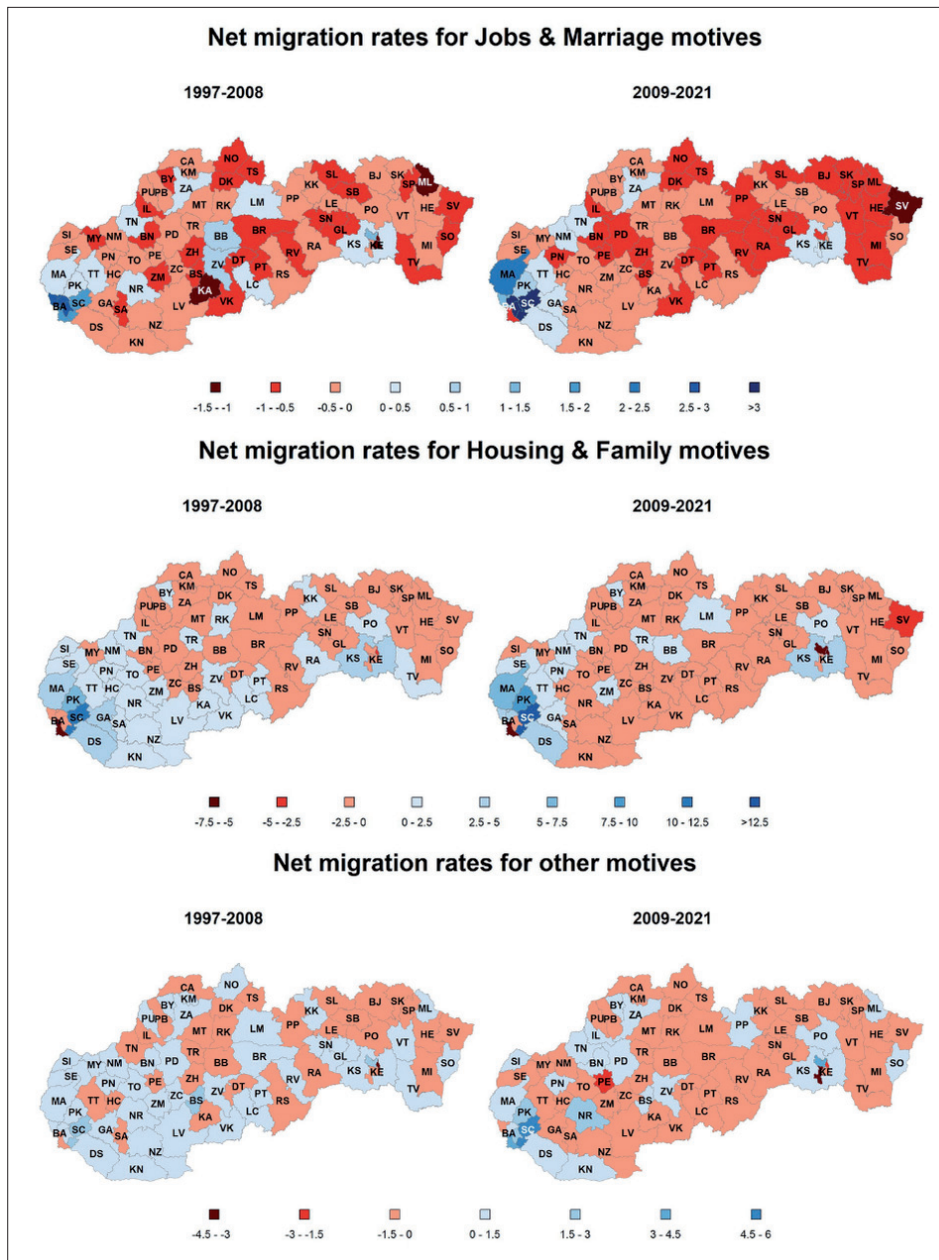


Fig. 4: Geography of major motives for internal migration, net rates per 1,000 population  
Source: authors



the 2009–2021 period (Fig. 4, upper panel). Housing consumption was enabled by the latent economy of Bratislava and regional capitals (Košice, Žilina, Trenčín, Žilina and Prešov) (Fig. 4, middle panel). Geographical patterns of ‘other’ migration motives (Fig. 4, bottom panel) seem quite diverse. There is a visible impact of the latent economy of Bratislava and highly urbanised regional capitals on net migration rates. Lifestyle migration may have boosted migration rates in prime tourist districts (Poprad, Piešťany, Banská Štiavnica). Ethnic factors may have impacted rates in districts with Hungarian (Komárno, Dunajská Streda) and Ruthenian-speaking (Medzilabroce) minorities. Pergi and Novotný (2022, 96) suggested that immigration by the Slovak-speaking population decreases the shares of the Hungarian-speaking minority, but their findings relate to the Košice NUTS 3 region. Assumptions on ethnicity-related migration require further verification.

#### 4.5 Alternative spatial structure

The alternative spatial structure entails metropolitan cores, metropolitan hinterlands and nonmetropolitan areas and comprises 70 spatial units. The results for the latter structure are

reported in Tables 5, 6 and 7. The results are quite similar for both spatial structures, but the explanatory power of the structure with 70 units is lower than that with 79 districts.

Each structure has its pros and cons. The spatial focus is the major strength of the structure with 70 units, as it acknowledges significant intraurban flows within the cities of Bratislava and Košice. The shares of intraurban flows in the total interdistrict flows were 11.23% for Bratislava and 6.15% for Košice in 1997–2021 in Slovakia. The structure, however, ignores substantial socioeconomic and sociodemographic disparities between individual districts of Bratislava and Košice cities. The Bratislava 1 district, for example, accounted for the oldest and most affluent population in Slovakia. The median age was 43.7 years in the Bratislava 1 district and 35.5 years in the Bratislava 5 district in the period 1997–2008. The average wage was 19.3%, and the marriage rate was 14.0% higher in the Bratislava 1 district than in the Bratislava 5 district in the same period (SOSR, 2023). Similar disparities were found for the Košice City districts. Socioeconomic and sociodemographic variables are important moderators of migration motives. We

	Net migration rate	Distance to Bratislava (km)	Urban population (%)	Unemployment rate (%)	Marriage rate	Divorce rate	Live birth rate	New flats
1997–2008: 70 districts								
Net migration rate	1							
Distance to Bratislava (km)	–0.457**	1						
Urban population (%)	–0.247*	–0.262*	1					
Unemployment rate (%)	–0.168	<b>0.620**</b>	–0.547**	1				
Marriage rate	–0.148	0.259*	–0.157	0.051	1			
Divorce rate	0.170	–0.470**	0.401**	–0.142	–0.082	1		
Live birth rate	–0.151	0.449**	–0.374**	0.361**	0.913**	–0.185	1	
New flats	0.456**	–0.372**	0.072	–0.530**	0.440**	0.028	0.260*	1
2009–2021: 70 districts								
Net migration rate	1							
Distance to Bratislava (km)	–0.428**	1						
Urban population (%)	0.030	–0.232	1					
Unemployment rate (%)	–0.321**	<b>0.687**</b>	–0.461**	1				
Marriage rate	–0.045	0.228	–0.093	0.043	1			
Divorce rate	0.393**	–0.596**	0.273*	–0.387**	0.176	1		
Live birth rate	0.009	0.303*	–0.252*	0.259*	<b>0.913**</b>	0.101	1	
New flats	<b>0.815**</b>	–0.515**	0.134	–0.551**	0.296*	<b>0.453**</b>	0.244*	1

Tab. 5: Correlation matrix for migration motives and socioeconomic variables. Source: authors' computations based on SOSR (2023) data  
Notes: marriage rate, divorce rate, live birth rate, and new flats are stated per 1,000 population; \*\* significant at the 0.01 level; \* significant at the 0.05 level; correlations above 0.5 are in bold

1997–2008			
Component (% of the total variance)	1 (29.48%)	2 (31.62%)	3 (21.61%)
New flats per 1,000 population	–0.796	0.467	–0.056
Unemployment rate (%)	<b>0.899</b>	0.164	–0.179
Distance to Bratislava	<b>0.678</b>	0.286	–0.396
Marriage rate per 1,000 population	–0.073	<b>0.970</b>	–0.046
Live birth rate per 1,000 population	0.203	<b>0.949</b>	–0.176
Urban population (%)	–0.337	–0.215	<b>0.627</b>
Divorce rate per 1,000 population	–0.021	0.002	<b>0.946</b>
2009–2021			
Component (% of the total variance)	1 (36.4%)	2 (30.41%)	3 (16.49%)
Distance to Bratislava	–0.881	0.326	–0.035
New flats per 1,000 population	<b>0.801</b>	0.302	0.002
Divorce rate per 1,000 population	<b>0.737</b>	0.162	0.151
Unemployment rate (%)	–0.746	0.168	–0.409
Live birth rate per 1,000 population	0.071	<b>0.969</b>	0.011
Marriage rate per 1,000 population	–0.025	<b>0.964</b>	–0.174
Urban population (%)	0.168	–0.094	<b>0.966</b>

Tab. 6: Factor analysis. Source: authors' computations based on the SOSR (2023) data  
Notes: Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalisation

	Unstandardised coefficients		Standardised coefficients	t	Sig.
	B	Std. error	Beta		
<i>1997–2008; adjusted R-squared = 0.515; F = 28.636, sig. 0.000</i>					
(Constant)	– 0.195	0.214		– 0.914	0.364
F1 (flats, distance, unemployment)	– 0.115	0.215	– 0.061	– 0.534	0.595
F2 (marriage, live births)	– 0.712	0.215	– 0.376	– 3.305	<b>0.002</b>
F3 (urban population, divorce)	– 0.063	0.215	– 0.033	– 0.294	0.770
<i>2009–2021; adjusted R-squared = 0.640; F = 47.177, sig. 0.000</i>					
(Constant)	– 1.048	0.267		– 3.920	<b>0.000</b>
F1 (flats, distance, unemployment, divorce)	1.875	0.269	0.644	6.960	<b>0.000</b>
F2 (marriage, live births)	0.071	0.269	0.024	0.263	0.794
F3 (urban population)	– 0.393	0.269	– 0.135	– 1.458	0.149

Tab. 7: OLS regression (variables significant at the 0.001 level are in bold)  
Source: authors' computations based on SOSR (2023) data

argue that the aggregation of urban (and suburban) districts obscures socioeconomic and sociodemographic disparities and misleads the analysis of migration motives.

## 5. Conclusions, limitations, and directions for further research

This research established that some motives behind internal migration were closely related and informed by the same factors over the long term in Slovakia. Job change, job proximity, and marriage, for example, presented a high correlation across the whole period of 1997–2021. The same conclusion applies to the high correlation between housing and family-related motives (Coulter & Scott, 2015; Gillespie et al., 2021). The findings support the proposition of the life course transition framework (Bailey, 2009). Migration inflows to metropolitan hinterlands, for example, featured prominently in the total net migration rates on regional levels. The flows were likely informed by considerations of housing costs and desirable lifestyles (Vidal & Huinink, 2019, Sandow & Lundholm, 2020, 286).

This research found that most of the stated motives behind internal migration (housing and family) differ from those assumed by socioeconomic theories about returns on human capital (Harris & Todaro, 1970). This finding is valid for motives stated at the proximal level. The analysis of migration rates and housing supply indicates a substantial concentration of interdistrict migrants in suburban districts of affluent metropolitan regions. This finding resonates with that of Morrison and Clark (2011) on the latent importance of employment and income for internal migration. The contradiction between assumptions of the human capital and life course theories diminishes if the 'total private costs of migration' (Sjaastad, 1962, 83) are considered. The psychic cost of migration refers to the trade-off between monetary gains from migration and loss of social networks. As noted by Sjaastad (1962, 85), 'Given the earnings at all other places, there is some minimum earning level at location *i* which will cause a given individual to be indifferent between migrating and remaining at *i*'. Migration to metropolitan hinterlands, for example, is a pragmatic solution to the total private costs of migration, as it combines improvements in housing with the preservation of jobs and social networks.

Our research has some important limitations. The research was based on secondary data provided by the SOSR. Our findings are limited by the range and structure of self-reported migration motives. Qualitative research on migration motives suggests that people may report both targeted and diffuse reasons for migration (Coulter & Scott, 2015), and the importance of migration motives may change significantly over the life course (Thomas, 2019; Thomas et al., 2019; Gillespie et al., 2021). The 'other' reasons, for example, accounted for a substantial part of the total migration motives. We were unable to identify a well-defined proxy for this motive.

Longitudinal data on migration motives and corresponding socioeconomic data were provided at the district (LAU 1) level. Our research indicated that the model with 70 territorial units performed worse than that with 79 units. Each aggregation causes loss of original diversity. We argue that there are significant differences between the city districts of Bratislava and Košice cities (including diverse intensities and directions of migration flows). The structure with 79 districts, of course, has its own limitation. For example, it does not correspond with the approximated functional urban regions or approximated functional regions based on daily commuting (Halás et al., 2014).

The limitations suggest directions for further research. Quantitative research on internal migration would benefit greatly from qualitative insight into migration motives over the life course. This research analysed the motives behind interdistrict migration. Further research may also consider differences between intra-district and inter-district migration. It is supposed (Thomas et al., 2019; Gillespie et al., 2020) that short-distance moves are motivated by housing consumption and important life course transitions (marriage, family growth, divorce), while education and employment inform longer-distance migration. Further research may also consider models with alternative spatial structures, such as approximated functional regions based on daily commuting.

## Acknowledgement

This research was supported by VEGA Grant No. 2/0001/22, 2/0143/21 and No. 2/0042/23.

## References:

- Alvarez, M., Bernard, A., & Lieske, S. N. (2021). Understanding internal migration trends in OECD countries. *Population, Space and Place*, 27(7), e2451. <https://doi.org/10.1002/psp.2451>
- Bailey, A. J. (2009). Population geography: Lifecourse matters. *Progress in Human Geography*, 33(3), 407–418. <https://doi.org/10.1177/0309132508096>
- Biagi, B., Faggian, A., & McCann, P. (2011). Long and short distance migration in Italy: the role of economic, social and environmental characteristics. *Spatial Economic Analysis*, 6(1), 111–131. <https://doi.org/10.1080/17421772.2010.540035>
- Bernard, A. (2017). Levels and patterns of internal migration in Europe: A cohort perspective. *Population Studies*, 71(3), 293–311. <https://doi.org/10.1080/00324728.2017.1360932>
- Bezák, A. (2008). Interregionálne migrácie na Slovensku v rokoch 2004–2006. *Geographia Cassoviensis*, 2(1), 7–12.
- Borjas, G. J., Bronars, S. G., & Trejo, S. J. (1992). Self-selection and internal migration in the United States. *Journal of Urban Economics*, 32(2), 159–185. [https://doi.org/10.1016/0094-1190\(92\)90003-4](https://doi.org/10.1016/0094-1190(92)90003-4)
- Boyle, P. J., Kulu, H., Cooke, T., Gayle, V., & Mulder, C. H. (2008). Moving and union dissolution. *Demography*, 45(1), 209–222. <https://doi.org/10.1353/dem.2008.0000>

- Cebula, R. J. (2005). Internal migration determinants: Recent evidence. *International Advances in Economic Research*, 11, 267–274. <https://doi.org/10.1007/s11294-005-6656-8>
- Clark, W., & Huang, Y. (2004). Linking migration and mobility: Individual and contextual effects in housing markets in the UK. *Regional studies*, 38(6), 617–628. <https://doi.org/10.1080/003434042000240932>
- Clark, W. A., & Maas, R. (2015). Interpreting migration through the prism of reasons for moves. *Population, Space and Place*, 21(1), 54–67. <https://doi.org/10.1002/psp.1844>
- Cooke, T. J. (2008). Migration in a family way. *Population, Space and Place*, 14(4), 255–265. <https://doi.org/10.1002/psp.500>
- Coulter, R., & Scott, J. (2015). What motivates residential mobility? Re-examining self-reported reasons for desiring and making residential moves. *Population, Space and Place*, 21(4), 354–371. <https://doi.org/10.1002/psp.1863>
- Dennett, A., & Wilson, A. (2013). A multilevel spatial interaction modelling framework for estimating interregional migration in Europe. *Environment and Planning A*, 45(6), 1491–1507. <https://doi.org/10.1068/a45398>
- Dommermuth, L., & Klüsener, S. (2019). Formation and realisation of moving intentions across the adult life course. *Population, Space and Place*, 25(5), e2212. <https://doi.org/10.1002/psp.2212>
- Gillespie, B. J., Mulder, C. H., & Eggleston, C. M. (2021). Measuring migration motives with open-ended survey data: Methodological and conceptual issues. *Population, Space and Place*, 27(6), e2448. <https://doi.org/10.1002/psp.2448>
- Greenwood, M. J. (1997). Internal migration in developed countries. In M. R. Rosenzweig, & O. Stark (Eds.), *Handbook of Population and Family Economics*, Vol. 1B (pp. 647–720). Elsevier. [http://dx.doi.org/10.1016/S1574-003X\(97\)80004-9](http://dx.doi.org/10.1016/S1574-003X(97)80004-9)
- Green, A. (2018). Understanding the drivers of internal migration, chapter 2. In T. Champion, T. Cooke & I. Shuttleworth (Eds.), *Internal Migration in the Developed World. Are we becoming less mobile?* (pp. 99–262). Routledge.
- Halás, M., & Klapka, P. (2021). Revealing the structures of internal migration: A distance and a time-space behaviour perspectives. *Applied Geography*, 137, 102603. <https://doi.org/10.1016/j.apgeog.2021.102603>
- Halás, M. (2014). Modelovanie priestorového usporiadania a dichotómie centrum – periféria, *Geografie*, 119(4), 384–405.
- Halás, M., Klapka, P., Bleha, B., Bednář, M. (2014). Funkčné regióny na Slovensku podľa denných tokov do zamestnania. *Geografický časopis*, 66(2), 89–114.
- Harris, J. R., & Todaro, M. P. (1970). Migration, unemployment and development: a two-sector analysis. *The American Economic Review*, 60(1), 126–142.
- Holland, J. A. (2012). Home and where the heart is: Marriage timing and joint home purchase. *European journal of population – Revue europeenne de demographie*, 28(1), 65. <https://doi.org/10.1007/s10680-011-9242-1>
- Jia, N., Molloy, R., Smith, C., & Wozniak, A. (2023). The economics of internal migration: Advances and policy questions. *Journal of Economic Literature*, 61(1), 144–180. <https://doi.org/10.1257/jel.20211623>
- Janotka, M., & Gazda, V. (2012). Modelling of the Interregional Migration in Slovakia. *Journal of Applied Economic Sciences*, 7(1 (19)), 48–55.
- Janotka, M., Gazda, V., & Horvath, D. (2013). Migration trends among regional clusters in Slovakia. *Engineering Economics*, 24(5), 437–446. <https://doi.org/10.5755/j01.ee.24.5.3377>
- Jolliffe, I. T., & Morgan, B. J. T. (1992). Principal component analysis and exploratory factor analysis. *Statistical methods in medical research*, 1(1), 69–95. <https://doi.org/10.1177/0962280292001001>
- Kalemka, S. V., Bernard, A., Corcoran, J., & Charles-Edwards, E. (2022). Has the decline in the intensity of internal migration been accompanied by changes in reasons for migration?. *Journal of Population Research*, 1–35. <https://doi.org/10.1007/s12546-022-09285-5>
- Kley, S. (2011). Explaining the stages of migration within a life-course framework. *European Sociological Review*, 27(4), 469–486. <https://doi.org/10.1093/esr/jcq020>
- Kennan, J., & Walker, J. R. (2011). The effect of expected income on individual migration decisions. *Econometrica*, 79(1), 211–251. <https://doi.org/10.3982/ECTA4657>
- Krisjane, Z., & Berzins, M. (2012). Post-socialist urban trends: new patterns and motivations for migration in the suburban areas of Riga, Latvia. *Urban studies*, 49(2), 289–306. <https://doi.org/10.1177/0042098011402232>
- Lerch, M. (2014). The role of migration in the urban transition: A demonstration from Albania. *Demography*, 51(4), 1527–1550. <https://doi.org/10.1007/s13524-014-0315-8>
- Lucas, R. E. (1997). Internal migration in developing countries. *Handbook of Population and Family Economics*, 1, 721–798. [https://doi.org/10.1016/S1574-003X\(97\)80005-0](https://doi.org/10.1016/S1574-003X(97)80005-0)
- Lundholm, E., Garvill, J., Malmberg, G., & Westin, K. (2004). Forced or free movers? The motives, voluntariness and selectivity of interregional migration in the Nordic countries. *Population, Space and Place*, 10(1), 59–72. <https://doi.org/10.1002/psp.315>
- Michálek, A., & Podolák, P. (2011). Impact of key socio-economic disparities on migration in Slovakia: economic diversification vs. traditional pattern. *European Spatial Research and Policy*, 18(1): 71–87. <https://doi.org/10.2478/v10105-011-0005-0>
- Mincer, J. (1978). Family migration decisions. *Journal of Political Economy*, 86(5), 749–773. <https://doi.org/10.1086/260710>
- Morrison, P. S., & Clark, W. A. (2011). Internal migration and employment: macro flows and micro motives. *Environment and Planning A*, 43(8), 1948–1964. <https://doi.org/10.1068/a43531>
- Niedomysl, T., & Amcoff, J. (2011). Why return migrants return: Survey evidence on motives for internal return migration in Sweden. *Population, Space and Place*, 17(5), 656–673. <https://doi.org/10.1002/psp.644>
- Gazda, M., & Novotný, L. (2014). Vývoj základných komponentov pohybu obyvateľstva na Slovensku vo vzťahu k vybraným ekonomickým ukazovateľom. *Geographia Cassoviensis*, 8(1), 5–17.
- Nowok, B., Findlay, A., & McCollum, D. (2018). Linking residential relocation desires and behaviour with life domain satisfaction. *Urban Studies* 55 (4), 870–890. <https://doi.org/10.1177/0042098016665972>
- OECD (2012). Redefining Urban: A New Way to Measure Metropolitan Areas; OECD. <https://doi.org/10.1787/9789264174108-en>.
- Ondoš, S., & Káčerová, M. (2015). Migration Responses to Regional Labor Market Conditions in Slovakia 1. *Ekonomický časopis*, 63(2), 188.
- Phan, D., & Coxhead, I. (2010). Inter-provincial migration and inequality during Vietnam's transition. *Journal of Development Economics*, 91(1), 100–112. <https://doi.org/10.1016/j.jdeveco.2009.06.008>
- Pregi, L., & Novotný, L. (2022). Impact of migration and natural reproduction on the development of the Slovak–Hungarian ethnic boundary in eastern Slovakia, 1991–2018. *Regional Statistics*, 12(1), 77–103. <https://doi.org/10.15196/RS120102>
- Rowe, F., & Patias, N. (2020). Mapping the spatial patterns of internal migration in Europe. *Regional Studies, Regional Science*, 7(1), 390–393. <https://doi.org/10.1080/21681376.2020.1811139>
- Sandow, E., & Lundholm, E. (2020). Which families move out from metropolitan areas? Counterurban migration and professions in Sweden. *European Urban and Regional Studies*, 27(3), 276–289. <https://doi.org/10.1177/096977641989301>
- Sjaastad, L. A. (1962). The costs and returns of human migration. *Journal of Political Economy*, 70(5, Part 2), 80–93. <https://doi.org/10.1086/258726>
- SOSR (2023): 'Demography and Social Statistics' database (2023), available at: <https://datacube.statistics.sk/>
- Spórna, T., & Krzysztofik, R. (2020). 'Inner' suburbanisation – Background of the phenomenon in a polycentric, post-socialist and post-industrial region. Example from the Katowice conurbation, Poland. *Cities*, 104, 102789. <https://doi.org/10.1016/j.cities.2020.102789>
- Šprocha, B., Bleha, B., & Nováková, G. (2022). Three Decades of Post-Communist Fertility Transition in a Subnational Context: The Case of Slovakia. *Tijdschrift voor Economische en Sociale Geografie*, 113(4), 397–411. <https://doi.org/10.1111/tesg.12515>
- Stark, O., & Bloom, D. E. (1985). The new economics of labour migration. *The American Economic Review*, 75(2), 173–178.
- Sýkora, L. & Stanilov, K. (2014). The Challenge of Postsocialist Suburbanization. In L. Sýkora & K. Stanilov (Eds.), *Confronting Suburbanization: Urban Decentralization in Postsocialist Central and Eastern Europe*. (pp. 1–21). John Wiley & Sons, Ltd.
- Šveda, M., Madajová, M., & Podolák, P. (2016). Behind the differentiation of suburban development in the hinterland of Bratislava, Slovakia. *Sociologický časopis/Czech Sociological Review*, 52(6), 893–925. <http://dx.doi.org/10.13060/00380288.2016.52.6.290>

Thomas, M. J. (2019). Employment, education, and family: Revealing the motives behind internal migration in Great Britain. *Population, Space and Place*, 25(4), e2233. <https://doi.org/10.1002/psp.2233>

Thomas, M., Gillespie, B., & Lomax, N. (2019). Variations in migration motives over distance. *Demographic Research*, 40, 1097–1110. <https://doi.org/10.4054/DemRes.2019.40.38>

Vidal, S., & Huinink, J. (2019). Introduction to the special collection on spatial mobility, family dynamics, and gender relations. *Demographic Research*, 41(21), 593–616. <https://doi.org/10.4054/DemRes.2019.41.21>

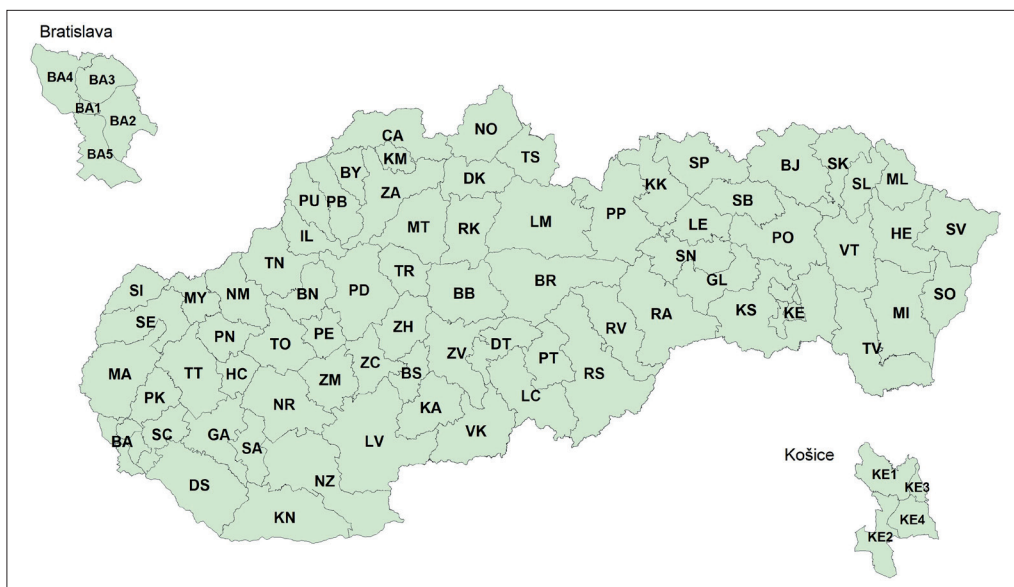
Ženka, J., Chreneková, M., Kokešová, L., & Svetlíková, V. (2021). Industrial Structure and Economic Resilience of Non-Metropolitan Regions: An Empirical Base for the Smart Specialization Policies. *Land*, 10(12), 1335. <https://doi.org/10.3390/land10121335>

**Please cite this article as:**

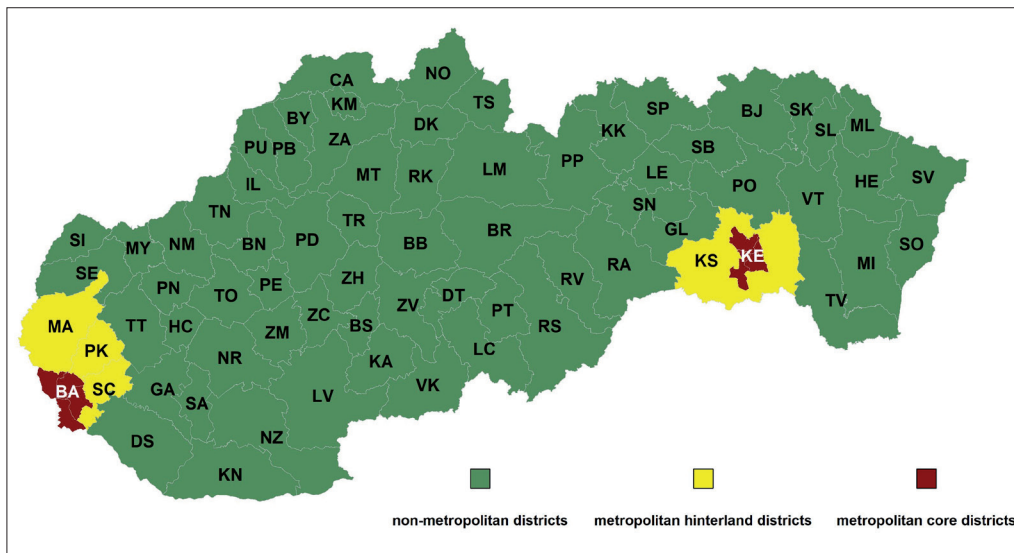
Baláž, V., Lichner, I., & Jeck, T. (2023). Geography of migration motives: Matching migration motives with socioeconomic data. *Moravian Geographical Reports*, 31(3), 141–152. <https://doi.org/10.2478/mgr-2023-0013>

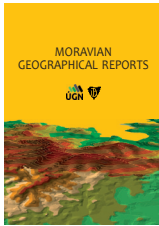
## Appendices

*Appendix 1: Spatial structure with 79 districts*



*Appendix 2: Spatial structure with 70 units*





The Czech Academy of Sciences, Institute of Geonics  
 Palacký University Olomouc, Faculty of Science  
 journal homepage: [www.geonika.cz/mgr.html](http://www.geonika.cz/mgr.html)  
 doi: <https://doi.org/10.2478/mgr-2023-0014>

# Examining voter turnout using multiscale geographically weighted regression: The case of Slovakia

Dominik KEVICKÝ<sup>a\*</sup> , Jonáš SUCHÁNEK<sup>b</sup>

## Abstract

*Voter turnout is an essential aspect of elections and often reflects the attitude of a country's population towards democracy and politics. Therefore, examining the distribution of voter turnout and determining the factors that influence whether or not people will vote is crucial. This study aims to find significant factors that underlie the different levels of electoral participation across regions in Slovakia during the 2020 parliamentary elections. In this interpretation, special attention is paid to the ability of the main theories of voter turnout to explain the behaviour of Slovak voters. The primary analytical tool is multiscale geographically weighted regression, which represents an advanced local regression modelling variant. The results indicate that the multiscale geographically weighted regression is superior to the global ordinary least square model in virtually all aspects. Voter turnout is generally higher in economically and socially prosperous localities and regions, which is in line with the societal modernisation theory. Additionally, factors connected to mobilisation theory and the concept of 'left behind places' also proved to be valuable. However, in other cases, such as with the share of retirees and potential habitual voting, the outcomes were not overly convincing, and further research is required.*

**Keywords:** voter turnout, parliamentary elections, theories of voter turnout, multiscale geographically weighted regression, left behind places, Slovakia

**Article history:** Received 4 May 2023, Accepted 5 September 2023, Published 30 September 2023

## 1. Introduction

"Vote!" is heard from candidates on all sides of the political spectrum before elections. Turnout, or the different levels of mobilisation of voters from different regions and social groups, can significantly influence the outcome of an election. Despite the importance of elections and repeated mobilisation of voters, voter turnout has shown a downward trend since the 1980s, observed both globally and in most regions of the world (Franklin, 2004; Solijonov, 2016). The decline in post-socialist countries of Central and Eastern Europe has been faster than in established European democracies (Solijonov, 2016). Low turnout rates are considered a "serious democratic problem" by both politicians and political scientists (Lijphart, 1997, 1). Thus, the factors influencing turnout became the focus of several analyses in political science, sociology, and geography (Reif & Schmitt, 1980; Páček et al., 2009; Schulz-Herzenberg, 2019).

Research into elections and their turnout began more seriously in the 1940s at Columbia University in New York. Through a series of public opinion surveys, Paul Lazarsfeld and his colleagues investigated how voters' attitudes toward voting are shaped in the months leading up to an election and examined how this process is influenced by existing attitudes, expectations, personal contacts, or affiliation with various social groups and

organisations (Blais, 2000). They pointed to the crucial role of categories such as education, socioeconomic status, or age in expanding the opportunities that individual voters can gain by participating in elections. Therefore, this sociological approach to participation is called the resource model (Brady et al., 1995; Schulz-Herzenberg, 2019).

The second traditional school of voting behaviour originated in the 1950s at the University of Michigan. It published its first conclusions in the classic monograph *The American Voter* (Campbell et al., 1960). The approach of this school is more social-psychological. While it does not dismiss the influence of the social categories with which the Columbia School works, it argues that they stand only at the beginning of the chain of causes and have only an indirect influence on the psychological processes that result in the decision to vote or not to vote (Brady et al., 1995). The Psychological Engagement Model of the Michigan School emphasises the influence of political interests, involvement, and party identification on participation but does not explain in principle why some people vote, and others do not (Blais, 2000; Schulz-Herzenberg, 2019).

A third group of approaches highlights the role of mobilising agents such as interest groups, churches, political parties, and other social networks. According to these approaches, the decision

<sup>a</sup> Department of Geography, Faculty of Science, Masaryk University, Brno, Czech Republic (\*corresponding author: D. Kevický; e-mail: [kevicky.dominik@mail.muni.cz](mailto:kevicky.dominik@mail.muni.cz))

<sup>b</sup> Department of Social Geography and Regional Development, Faculty of Science, Charles University, Prague, Czech Republic

to participate in elections is influenced by the people and groups we encounter daily (Franklin, 2004). Mobilisation campaigns by political parties and candidates can be counted among these approaches. Geographers studying the uneven impact of political campaigns in this context write about the campaign effect (see Johnston, 1987; Pattie et al., 2019). The media is an important and frequently studied mobilising agent (Norris, 2000).

The fourth group of approaches is based on rational choice theory and emphasises the utility of voting for voters. If the costs, in the form of the time it takes to obtain information about candidates or the actual participation in voting, are higher than the expected gains, such as the likelihood of influencing the outcome of the election, the voter will stay home (Blais, 2000; Franklin, 2004; Schulz-Herzenberg, 2019). However, the notion that the level of turnout can be explained by a model based on individuals' rational decision-making is challenged by the paradox of voting formulated by the American economist Anthony Downs in the 1950s. According to him, the costs of voting, even if low, almost always outweigh the expected benefits because the probability that a voter's vote will make a decisive contribution to the election of the chosen party or candidate is negligible (Fieldhouse, 2019, 319).

The above approaches have been research-tested in many countries, and there is more interest in the issue of participation in some countries than in others. According to Plešivčák et al. (2016), there has been no long-term and systematic geographical research on voter turnout in Slovakia. Most authors address the issue only as a part of an overall analysis of elections in Slovakia (e.g. Kostecký, 2001; Madleňák, 2012; Kostecký & Krivý, 2015; Rybář et al., 2017). A few works focused on Slovak elections have paid more detailed attention to geography of turnout (Mikuš & Gurňák, 2014; Kevický, 2020a, 2020b; Kevický & Daněk, 2020). These papers have used correlation analysis or ordinary least square (OLS) to explain the factors influencing voter turnout. No work has attempted to explain the distribution of voter turnout in Slovakia using more advanced methods, such as geographically weighted regression (GWR) or multiscale geographically weighted regression (MGWR), which directly work with an aspect of geographical proximity.

This study aims to find significant factors influencing different electoral participation levels in Slovakia regions. In doing so, it will ask what factors influence voter turnout. Do these factors have the same impact throughout Slovakia, or is there spatial heterogeneity? Does the same factor cause an increase in turnout in one place and a decrease in turnout in another? In the search for answers to these questions, special attention will be paid to the ability of the main theories of voter turnout to explain the behaviour of Slovak voters. The primary analytical tool is the MGWR which represents an advanced local variant of regression modelling (Fotheringham et al., 2017). MGWR is not only able to identify potential spatial variation of analysed relationships, but also to manifest how different processes operate at various spatial scales (i.e. local, regional, and global) by estimating unique spatial bandwidths for each covariate (Cupido et al., 2021; Suchánek & Hasman, 2022). The geographic unit of analysis is municipalities, and we only pay attention to the 2020 parliamentary elections.

The following section presents the theories by which regional differences in voter turnout are most often explained and our hypotheses. The third section presents the evolution of turnout in parliamentary elections in Slovakia. That is followed by an introduction of the data and methods used in this paper and then the results of the analyses, while the last two sections discuss and summarise the paper's results.

## 2. Theories of voter turnout

Theories explaining voter turnout could be classified into two main streams according to the data type. On the one hand, there are theories using individual data. These theories focus

on the voting behaviour of individuals. They aim to find out how likely a particular voter is to participate in a given election and what influenced him or her in his or her decision. The most well-known theories in this category include the rational choice theory (see Downs, 1957) or the theory of valence politics (see Clarke et al., 2009). On the other hand, there are theories using aggregate data. These theories focus on analysing turnout at the level of a region and determining how and why it differs from other regions. Given the study's objective, these theories will be presented in more detail.

Societal modernisation theory assumes that a democratic form of government is a characteristic feature of modern society and that participation in elections is a necessary precondition for democracy. The degree of modernisation of a society can be measured quantitatively by a set of socioeconomic indicators. The higher the degree of modernisation, the higher the demands are made on the active participation of citizens in decision-making processes (Norris, 2002). Therefore, authors such as Norris (2002) and Birch (2003) conclude that the more advanced the modernisation of a society is, the higher participation in elections can be expected. Indicators traditionally used to measure the degree of modernisation are, for example, the urbanisation rate, the index of economic or human development, or the share of people working in the primary sector.

The theory of disenchanted voting explains voter turnout using socioeconomic indicators similar to societal modernisation theory but interprets their impact differently. The reason for the creation of this theory was the apparent inadequacy of societal modernisation theory for explaining the development and regional differences in voter turnout in post-socialist states. According to Kostadinova (2003) and Páček et al. (2009), the fact that a state has gone through a period of socialism reduces turnout while specifically conditioning the effect of socioeconomic characteristics. Nový (2013) notes that the specifics of socialist development caused economic and political problems after the fall of socialism. Therefore, although the indicators of social and economic development at the aggregate level grew, the quality of life of some citizens declined. In response, they decided to resign from participation in the democratic process. By this reasoning, the disenchanted voter theory seeks to explain why, in parallel with economic and social development, voter turnout declined in post-socialist states, while societal modernisation theory predicted that it would increase.

The socioeconomic status theory draws directly from the classical Columbia School of voting behaviour. It includes several approaches that explain voter turnout using individual citizens' economic and social characteristics. The most commonly used indicators are education, income, type of employment, unemployment, gender, or age of the person. The aim is to determine what socioeconomic characteristics of individuals influence their decision to go to votes. According to this theory, individuals with higher socioeconomic status are more likely to participate in elections because they have more resources (money, skills, or information) that reduce the cost of voting and allow them to gain more significant gains from the voting results (Wolfinger & Rosenstone, 1980). A criticism of the socioeconomic status theory is that socioeconomic characteristics do not tell us much about the motivation to vote and are often only indicators of other factors influencing voting behaviour.

Mobilisation theory assumes that the decision to vote or not to vote is not only based on citizens' values and attitudes but also strongly influenced by their surroundings. The theory assumes that voters are politically mobilised. Rosenstone and Hansen (2009) refer to political mobilisation as the process by which candidates, political parties, activists, and non-political organisations, such as churches, trade unions or special interest

groups, persuade citizens to vote. They distinguish between two types of mobilisations, namely, direct, and indirect. Rosenstone and Hansen (2009) consider direct mobilisation cases in which a political party or candidates approach a potential voter. Methods of such mobilisation include pre-election rallies, media campaigns, and contacting voters by telephone, mail or electronically. In the case of indirect mobilisation, a person is influenced by people in their neighbourhood. They may be mobilised by their friends, work colleagues, neighbours, and religious community members. The ethnic homogeneity of the community may also play a significant role. Linek (2015) also documented examples showing that the probability that a citizen will participate is significantly increased if an immediate family member has participated in an election. In addition, Knack (1992) notes that in certain areas, there is strong social control and pressure on residents to participate in elections due to the structure and stability of the settlement. Failure to participate can lead to the social exclusion of the resident from the community. The phenomenon of social control is particularly typical for small rural communities (Kostecký & Krivý, 2015).

The theory of habitual voting assumes that a voter who has participated in past elections is more likely to participate in future elections. Although the first ideas about voter turnout as a habit appeared in the work of Michigan School authors, the issue began to receive more attention after the publication of the study by Green and Shachar (2000). The theory posits that voting in elections contains an element of habit. Over time, a citizen develops a habit of being or not being part of the electoral process. The longer they participate or do not participate in voting, the more the habit is reinforced. Therefore, an important explanatory variable for turnout is participation in previous elections. According to Denny and Doyle (2009), citizens participate in elections regardless of whether they have a positive view of voting or think voting is the right thing to do. All that matters is that voters have built the habit of participating in elections in their minds. Within the post-socialist states, this can be seen in the high voter turnout of the older population, which built up the habit of going to vote during the socialist period when it was compulsory and retains this habit even today (Linek, 2013). Kostecký and Krivý (2015) note that higher voter turnout in parliamentary elections in small municipalities may be due to higher turnout in municipal elections. Thus, citizens develop a habit of participating in any election. The weakness of this theory is that it fails to explain why first-time voters participate in elections since they have not formed the habit of going to vote.

Moreover, many of these theories can also be connected to the geography of discontent and to 'left behind places' – concepts of timely relevance in social, political, and geographical research (Rodríguez-Pose, 2018; Pike et al., 2023). In simple terms, places that are objectively or subjectively associated with being left behind (supposedly by corrupt elites, metropolitan economic powerhouses, etc.) are often connected to feelings of discontent, neglect, and political disengagement (Pike et al., 2023). These perceived experiences, along with various feelings of political resentment, may result in voters turning away from voting in certain areas (Bucci, 2017), or possibly inclining to vote for radical populist parties (Rodríguez-Pose, 2018). However, who votes (or does not vote) is not the same everywhere, and such 'pools of nonvoters', potentially available to populism, are not evenly spread across space (Agnew & Shin, 2017).

Finally, to discuss the explanatory power of the above theories of voter turnout in the conditions of Slovak society, three hypotheses were formulated, which, considered together, will allow the testing of the explanatory power of these theories and, at the same time, identify the main factors underlying geographical differences in voter turnout. It is clear from the discussion that these theories do not represent mutually exclusive sets of propositions but overlap in parts and, in some cases, rely on the same or similar indicators

while interpreting their meaning differently. Therefore, the validity of each theory cannot be confirmed or refuted; we can only assess their relative contribution to explaining the relationship between the level of electoral participation and the social, economic, cultural, and other characteristics of the municipalities of Slovakia, which we express using empirical indicators. The hypotheses were formulated in such a way as to allow the best possible assessment of the theories' explanatory power and, at the same time to allow them to be tested using empirical indicators at the municipality level. The hypotheses are labelled H1 to H3.

**H1: Voter turnout is higher in municipalities with a higher share of the population with a university education, a lower share of people working in the primary sector and a low unemployed population.**

If this hypothesis proves valid, the societal modernisation and socioeconomic status theories would be relevant for explaining geographic differences in turnout. The theory of disenchanting voting would be more appropriate for negative results for this hypothesis, as it predicts the opposite results to the previous two theories. The variables chosen to test the hypothesis are related to the degree of modernisation of society, which all three of the above theories work with. In doing so, the relationship between the theories is not ambivalent, and the validity of one does not preclude the validity of the other.

**H2: Voter turnout is higher in municipalities with smaller populations, with a share of the population belonging to the Roman Catholic Church and a higher share of the population of Slovak nationality.**

The hypothesis aims to test whether there is a more indirect mobilisation effect in Slovakia, conditioned by a higher representation of members of a religious community, national homogeneity, or social control in municipalities with a small number of inhabitants.

**H3: Voter turnout is higher in municipalities with a higher proportion of residents of post-working age.**

This hypothesis tests the habitual voting theory, assuming that older people have developed the habit of voting from the socialist period and thus participate in elections regularly, regardless of other factors. However, age structure is also related to other factors, such as economic development, urbanisation rate or migration balance. When interpreting the relationship between turnout and age, these factors' influence must also be considered.

### 3. Electoral turnout in Slovakia

Ten parliamentary elections have been held in Slovakia since 1989. The highest turnout was achieved in the very first democratic elections after the fall of the communist regime, held in 1990 (see Fig. 1). The turnout in these elections was above 95%, and no district had a turnout below 90%. In the next elections in 1992, turnout dropped by ten percentage points and continued to fall, except for the 1998 elections, which were specific to Slovakia (Krivý, 1999), until it reached an all-time low (54.7%) in the 2006 elections. In some districts, not even half of the eligible voters participated in these elections. In 2010, 2012 and 2016 elections, voter turnout stabilised below 60%. Almost two-thirds of all eligible voters took part in the 2022 elections.

The level of inter-regional disparities followed the opposite trend compared to the evolution of voter turnout. Figure 1 shows the evolution of the coefficient of variation, which reflects the overall level of differences between districts (it was calculated for a set of 79 districts of Slovakia, formed in 1996). The evolution of regional variability can be interpreted as a gradual widening of regional differences in voter turnout, from the lowest level in 1990 to the highest level in 2020. This trend was significantly interrupted in 1998 when the anti-Mečiar coalition succeeded in mobilising voters even in districts with lower turnout.

The increase in regional variability is confirmed by the evolution of differences in regions shown in Figure 2. Except for the 1998 elections, there is a clear trend of gradual differentiation, i.e. a moving away of most regions from the Slovak average. On the one hand, there is the group of Bratislava, Žilina and Trenčín regions with above average and relatively increasing participation. On the other hand, there is the group of Nitra, Banská Bystrica and Prešov regions with below average and relatively decreasing participation. The biggest 'outsider', i.e. the region furthest from all the others in terms of turnout, is the Košice region, with an extremely low turnout. While the difference between the Bratislava and Košice regions was zero in 1998, by 2010, it had risen to 15 percentage points; in 2016, it was as high as 23 percentage points. On the contrary, the Trnava region has long been the most typical within Slovakia, with a value remarkably close to the national average. The most notable change has been

in the Bratislava region, which had the lowest voter turnout in the 1990s but substantially increased after 2000 and had the highest turnout in the 2010, 2016 and 2020 elections.

### 4. Data and methodology

Voter turnout in the 2020 parliamentary elections was analysed. The territorial units used for the analysis were municipalities. In addition, Bratislava and Košice were divided into urban districts to increase the weight of population-sized districts in the analysis. The military district of Valaškovce was omitted from the analyses because no one has a permanent residence in its territory. Thus, we worked with a total of 2,926 administrative units which represents the finest administrative available level for which the selected independent variables are available.

#### 4.1 Data

Data on voter turnout at the municipality level were obtained from the Statistical Office of the Slovak Republic (2023b). The independent variables were then chosen to relate to those aspects of the social structure and location of municipalities with which the theories mentioned above of turnout work. Two methods were used to avoid the multicollinearity of the independent variables. First, variables with high pairwise correlations with any of the other independent variables were excluded by correlation analysis. Subsequently, the multicollinearity test verified that none of the independent variables had a tolerance value less than 0.5 or a variance inflation factor (VIF) value greater than 2.

A total of seven independent variables were selected (Tab. 1). The share of the unemployed population (Unemployment), share of people working in the primary sector (Agricultural workers) and the share of the population with a university education (Tertiary Education) were selected to test the validity of the socioeconomic status theory, societal modernisation theory and theory of disenchanting voting. To test the predictive power of the mobilisation theory, the variables of the religious and national status of the population were included, namely the share of the population belonging to the Roman Catholic Church (Catholics) and the share of the population of Slovak nationality (Slovaks). Also, logarithmically transformed municipality population sizes (Municipality size) were chosen as an indicator of the mobilisation theory. The proportion of residents of post-working age (Retirees) was chosen as an indicator relevant to the verification of the habitual voting theory. The data source on the social structure was the 2021 Population and Housing Census (Statistical Office of the Slovak Republic, 2023a). All variables entering the final models were standardised.

#### 4.2 Methods

To examine associations between selected variables and voter turnout, we first calibrated an ordinary least square (OLS) regression model. In simple terms, OLS regression analysis represents a 'traditional' linear model which finds the best fit between analysed covariates via the minimised sum of squared prediction errors. This method proves to be very helpful not only

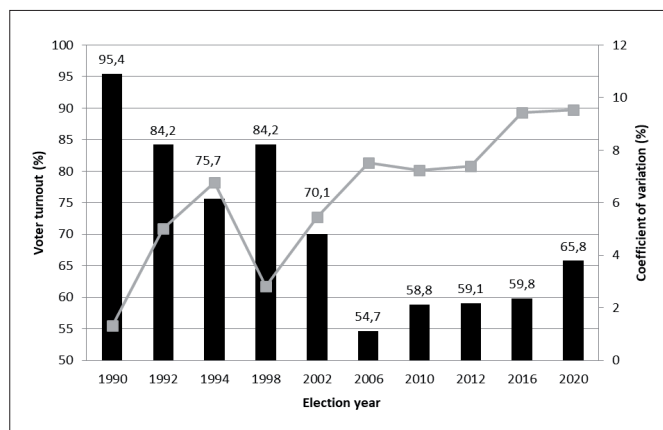


Fig. 1: Development of voter turnout in parliamentary elections in Slovakia (columns, left axis) and the coefficient of variation of voter turnout in districts (curve, right axis)  
Sources: authors' elaboration according to the Statistical Office of the Slovak Republic (2023b)

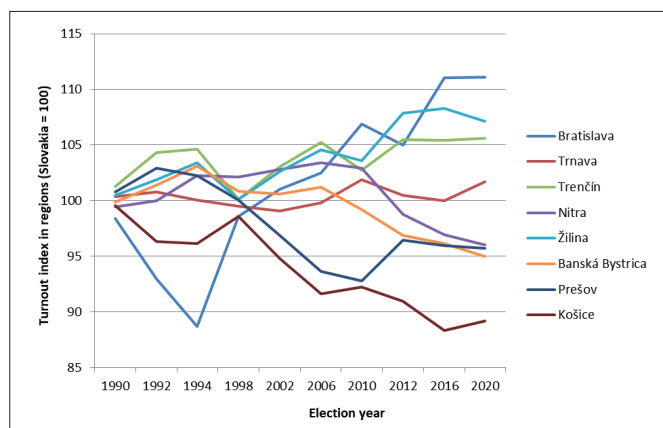


Fig. 2: Turnout index in regions in relation to the national average  
Sources: authors' elaboration according to the Statistical Office of the Slovak Republic (2023b)

Name of variable	Description	Data source
Municipality size	Logarithmically transformed municipality population size	2021 Population and Housing Census
Retirees	The proportion of residents of post-working age	2021 Population and Housing Census
Slovaks	The share of the population of the Slovak nationality	2021 Population and Housing Census
Tertiary education	The share of the population with a university education	2021 Population and Housing Census
Catholics	The share of the population belonging to the Roman Catholic Church	2021 Population and Housing Census
Unemployment	The share of the unemployed population	2021 Population and Housing Census
Agricultural workers	The share of people working in the primary sector	2021 Population and Housing Census

Tab. 1: Variables used to explain voter turnout  
Sources: authors' calculations



due to its versatility and capability to make predictions, but also by providing crucial insights into relations between variables. Exploring mutual relationships of attributes in aggregate units by utilising the OLS analysis proved to be vital in a large number of studies analysing voter turnout (e.g. Kostadinova, 2003; Kerwin Kofi & Stephens Jr., 2013; Kevický & Daněk, 2020). However, the OLS analysis, like other global regression models, can provide only for results that represent average coefficient values for the whole unit of analysis. Assuming that each identified relationship is constant across the country is very limiting as the strength, scale, and even direction of covariates determining voter behaviour might substantially vary across spaces and places (Fotheringham et al., 2021). As such, conventional regressions (e.g. OLS or spatial error) can suitably act as a baseline for the local model results, but most attention should be placed on calibrating MGWR models, which superseded global and standard GWR models alike (Fotheringham, 2023).

The deficiency of OLS models can commonly be manifested through significant spatial clustering of its residuals estimated by spatial autocorrelation methods. The overall degree of clustering is dependent on the weighting matrix<sup>1</sup> and can be quantified by the global Moran's I coefficient. Moran's I takes on values from  $-1$  to  $1$  which indicate whether positive or negative type of global clustering takes place (Cliff & Ord, 1981). Moreover, the local indicator of spatial association (LISA, see Anselin, 1995) analysis is used to verify the potential existence of spatial non-stationarity, as in such cases the usage of global models is generally inadequate (Suchánek & Hasman, 2022). Consequently, the LISA analysis can precisely detect various cases of spatial variation, i.e. clusters (hot and cold spots) and outliers, which then can be visualised for easy-to-understand mapping outcomes (see also Suchánek & Hasman, 2023).

Finally, we employ the multiscale geographically weighted regression (MGWR) analysis to fittingly compensate for the common shortcomings of traditional global regression models. MGWR represents a cutting-edge spatial regression technique which utilises geographical proximity to explore spatially varying relationships between variables (Zhou, 2022). Like conventional

geographically weighted regression methods, MGWR models utilise geographical weighting to generate location-specific regression coefficients. The resulting coefficients are based on proximity between centroids of each unit where the mutual influence of each unit gradually decays with distance (Fotheringham et al., 2017). The coefficients which surpass the adjusted t-value threshold (95%) can also be mapped for a visual overview of MGWR outcomes. But most importantly, MGWR also considers the possibility that the studied relationships may vary at different spatial scales, i.e. local, regional, and global. This is possible due to MGWR allowing bandwidths to be optimised to individual covariates entering the model (for more details, see Fotheringham et al., 2017; Li & Fotheringham, 2020; Fotheringham & Sachdeva, 2022). Therefore, the added value of MGWR models in our research is twofold. First, MGWR indicates the potential existence of spatial variance of variables' effect on electoral behaviour. Secondly, by relaxing the assumption that all processes operate at the same scale, we can further investigate various spatial mechanisms that ultimately affect these differences (see also Cupido et al., 2021).

## 5. Results

Before we move onto the description of regression results, we first run the LISA analysis to develop a comprehensive overview of spatial variation of voter turnout across the country. This helps the reader to understand which regions or specific locations vote the most or least before subsequent analyses that aim to understand what attributes and processes contribute to these spatial differences. Afterwards, we inspect the OLS model analysis results which we then compare with the MGWR model. This allows us to demonstrate clear improvements and benefits of the latter.

As shown in Figure 3, there is a strong spatial variation in voter turnout across Slovakia, with significant clustering occurring in many parts of the country. The considerable level of systematic spatial clustering is also indicated by a very high Moran's I value (0.409). Clusters of high voter turnout stretch from the capital Bratislava northeastwards to the Tatra Mountains. In contrast, clusters of low turnout are situated mainly in the southern and eastern parts of Slovakia.

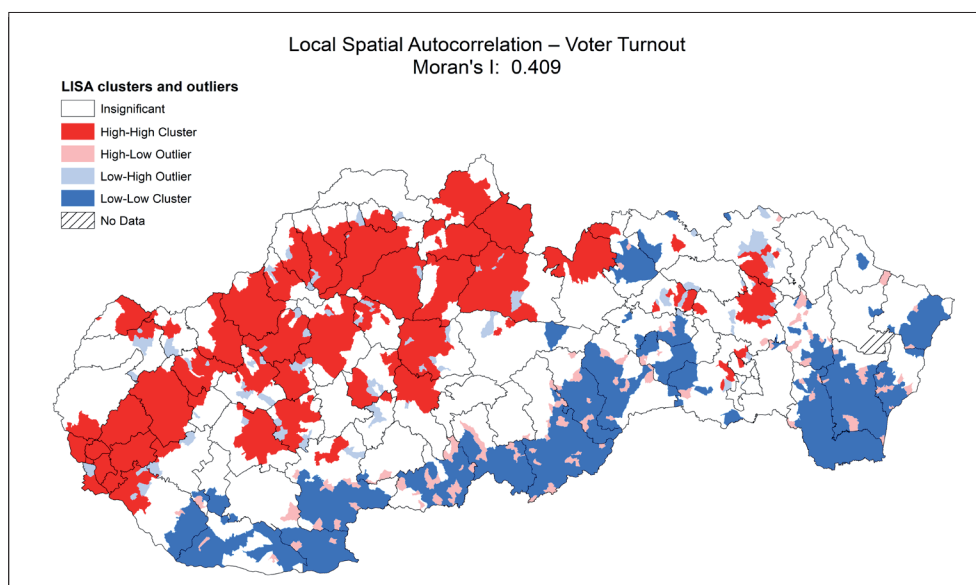


Fig. 3: Local Spatial Autocorrelation of Voter Turnout in Slovak Municipalities in 2020. Sources: authors' elaboration

<sup>1</sup> In our study, the weighting matrix of 8751.2911 metres for spatial autocorrelation methods was calculated using the Euclidean distance method in ArcMap 10.7. This value represents the minimum distance for each unit to have at least one neighbour. Other several weighting matrices were also tested (the 10 km distance or the queen-based contiguity weight matrix) which ultimately led to very similar results. For the MGWR model, we utilised a conventional Gaussian model and the adaptive bi-square kernel type weighting, which is the default setup in the MGWR 2.2 software.

**5.1 Global regression model results**

To further investigate what lies behind these previously identified distinctions of voter turnout, we first evaluate results stemming from the OLS model (Tab. 2). First and foremost, it is important to note that in this case, it is not necessary to rely on statistical significance as we are assessing a dataset that represents the whole population. Thus, we are not essentially drawing inferences, but rather exploring actual and verifiable differences. This is, however, not the case for the MGWR analysis, where an inferential modelling approach remains relevant due to the use of spatial weighting and individual assessments of each unit where their uneven absolute size is considered (see Jones et al., 2015). Regardless, the only variable in the model that did not yield statistical significance is the one pertaining to the share of agricultural workers.

In the global model, the share of the tertiary-educated individuals exerts by far the strongest positive effect (0.523) on voter turnout. This implies that higher levels of tertiary education in municipalities are associated with higher electoral turnout on average. Additionally, several other variables also exhibit relatively strong levels of influence on voting. The share

of Catholics reports a positive regression coefficient value (0.211) as well, while the municipality sizes (− 0.278) and the level of unemployment (− 0.224) have negative effects on voter turnout. This suggests that, generally, larger municipalities (in terms of population) and higher unemployment rates are related to lower voter participation. Another noteworthy relationship in

Voter turnout	Std. Coefficient	Std. Error	p-value
Intercept	0.000	0.012	1.000
Municipality size	− 0.278	0.015	< 0.001
Retirees	0.069	0.014	< 0.001
Slovaks	0.130	0.013	< 0.001
Tertiary education	0.523	0.015	< 0.001
Catholics	0.211	0.014	< 0.001
Unemployment	− 0.224	0.017	< 0.001
Agricultural workers	0.019	0.014	0.174
N	2,926		
AICc	5,879.7		
Adj. R <sup>2</sup>	0.565		

Tab. 2: Global regression model (OLS)  
Sources: authors' calculations

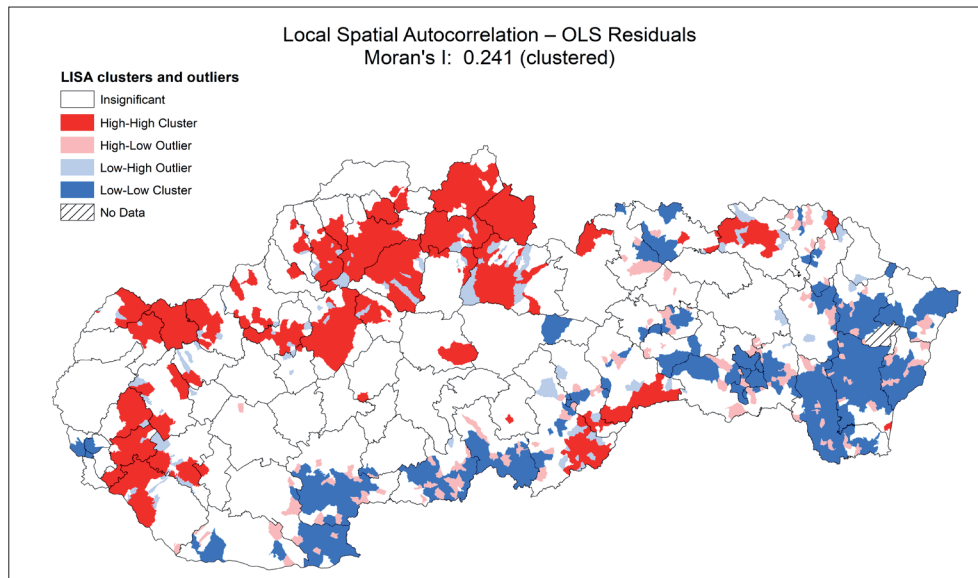


Fig. 4: Local Spatial Autocorrelation of OLS residuals (municipality-level)  
Sources: authors' elaboration

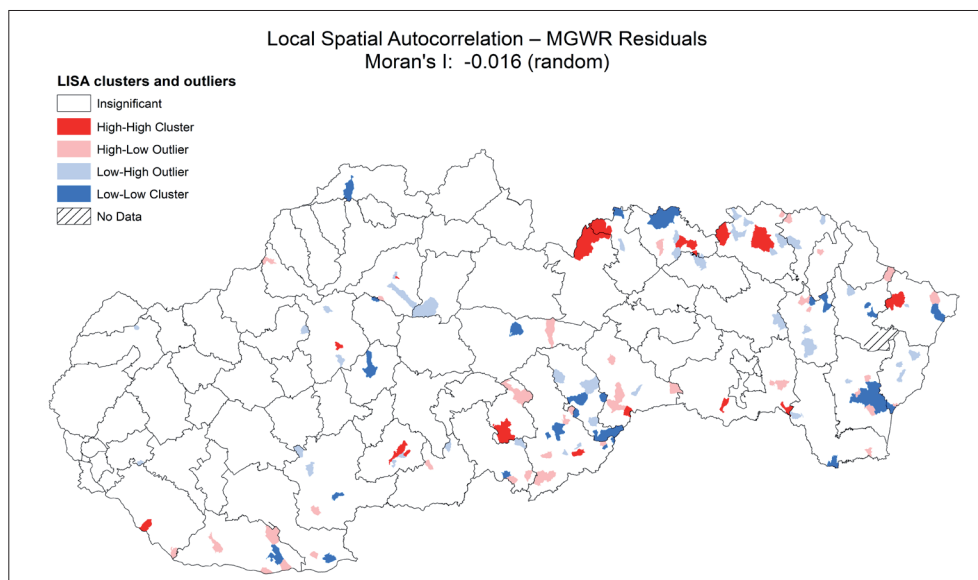


Fig. 5: Local Spatial Autocorrelation of MGWR residuals (municipality-level)  
Sources: authors' elaboration

the model is between the voter turnout and the share of native population (Slovaks) with a coefficient of 0.130. Surprisingly, the effect of the share of retirees is rather weak (0.069), while the influence of agricultural workers is virtually negligible (0.019). Furthermore, considering the vast number of units (2,926) included in the regression, the adjusted R-squared ( $R^2$ ) value of 0.565 is relatively high.

As mentioned in the previous section, a common limitation of OLS models lies in the significant residual clustering in space, as indicated by spatial autocorrelation methods. By employing the LISA analysis, we do indeed confirm a significant systematic clustering of residuals which signals the existence of spatial non-stationarity of studied relationships (Fig. 4). In other words, we identify many regions in Slovakia where neither high nor low voter turnout is satisfactorily explained by the global model, indicating that the utilisation of MGWR is desirable. Before we evaluate the MGWR results and mapping outcomes, we likewise conduct a LISA analysis on MGWR residuals to appropriately juxtapose the evident advancements of the MGWR model (Fig. 5). Moran's I values are also included in the figures.

### 5.2 MGWR model results

As demonstrated by the lack of MGWR residual clustering in the LISA analysis (Fig. 5), MGWR generates a more suitable model for both exploring and explaining electoral turnout in Slovak municipalities. These improvements are also reflected in the lower value of the corrected Akaike Information Criterion (AICc) and considerably higher adjusted  $R^2$  value (Tab. 3). Moreover, the resulting coefficients are computed separately for each municipality, which allows us to develop custom maps with a uniform scale of regression strength and direction for more detailed evaluations (Fig. 6). All studied relationships also have their own assigned bandwidth (included in the mapping outcomes), which indicates the spatial scale upon which each process operates.

Starting with the municipality size variable (Fig. 6A), we recognise a uniform and relatively moderate negative effect on voter turnout across the entire country. This implies that smaller municipalities tend to have higher voter turnout regardless of their geographical location. This is consistent with the previous findings of the global OLS model. The bandwidth value is rather high, suggesting that this process potentially operates at a scale between regional and global. This is also reflected in the resulting map, as there are no statistically nonsignificant values in any municipalities, although the effect appears to be slightly weaker in the northwestern parts of Slovakia.

Similar to the global model, the relationship between the share of retirees (Fig. 6B) and voter turnout is quite surprising. Apart from one very small 'island' of significant negative coefficients, there are several regions which report a positive effect, primarily located in southern parts of the country with one region in the north. The bandwidth value indicates a somewhat local scale;

however, in most parts of the country, the outcomes are statistically insignificant. This overall finding is unexpected and deviates from what was initially anticipated.

The share of Slovaks (Fig. 6C) exhibits a low bandwidth value and produces intriguing outcomes. First, there is a clear spatial variability in the observed relationship, with a large portion of the northern and 'middle' areas of the country showing a strong positive effect. Additionally, there are other smaller territories across Slovakia reporting both positive and negative effects with varying coefficient strengths. This is both compelling and puzzling at the same time. Upon examining the spatial distribution of ethnic minorities (i.e. Hungarians, Roma) in Slovakia, we find that areas that display predominantly nonsignificant estimates generally have a higher share of minorities, and vice versa. Based on this, we incline to the interpretation that regions with a higher share of Slovaks tend to have higher voter turnout, despite some perplexing outcomes.

The share of tertiary education (Fig. 6D) also yields intriguing results. Given the lowest generated bandwidth among the covariates, MGWR allows us to map out numerous spatial 'nuances' across the country. While tertiary education had by far the strongest positive effect on voter turnout in the global model (mean and median MGWR coefficients were also the strongest), we can clearly demonstrate that this effect is not borne out on a national level. In other words, there are many regions where voter turnout did not significantly rely on tertiary education, alongside areas that were greatly affected by this pivotal attribute. Conversely, the share of Catholics (Fig. 6E) is easier to comprehend. As previously anticipated, the effect is fairly concise – with a consistent direction and strength, which is moderately positive, and almost nationalised. The bandwidth value then suggests a regional scale.

Along with the covariate of municipality sizes, the share of unemployment (Fig. 6F) was the only other variable which presumed a negative impact on voter turnout in the global model. In this case, the MGWR model does not add much value to the evaluation, as the effect remains virtually the same. The semi-global bandwidth does not leave much room for geographical variations, and the strength of the coefficients is effectively homogenous at the given scale.

Upon examining the regression coefficients obtained from the share of agricultural workers, we concluded that it is unnecessary to include the map in this paper. Both models suggest no noticeable effect of agricultural workers on electoral turnout. The minimum (0.007) and maximum (0.030) local estimates are essentially non-existent, and the vast majority of these coefficients resulted as nonsignificant, also rendering the bandwidth value practically global in scale (2,765).

Finally, due to each municipality having its own adjusted local  $R^2$  value (Fig. 6G), it is evident that the explanation of variability through the selected independent variables is not spatially

Voter turnout	Mean	S.D.	Min.	Median	Max.
Intercept	- 0.148	0.200	- 0.620	- 0.121	0.214
Municipality size	- 0.283	0.055	- 0.353	- 0.295	- 0.177
Retirees	0.073	0.124	- 0.261	0.060	0.369
Slovaks	0.344	0.399	- 0.369	0.238	1.475
Tertiary education	0.492	0.247	- 0.382	0.468	1.291
Catholics	0.139	0.044	0.045	0.134	0.273
Unemployment	- 0.171	0.040	- 0.247	- 0.173	- 0.093
Agricultural workers	0.018	0.009	0.007	0.014	0.030
N	2,926				
AICc	4,695.5				
Adj. $R^2$	0.743				

Tab. 3: Multiscale geographically weighted regression model (MGWR)  
Sources: authors' calculations

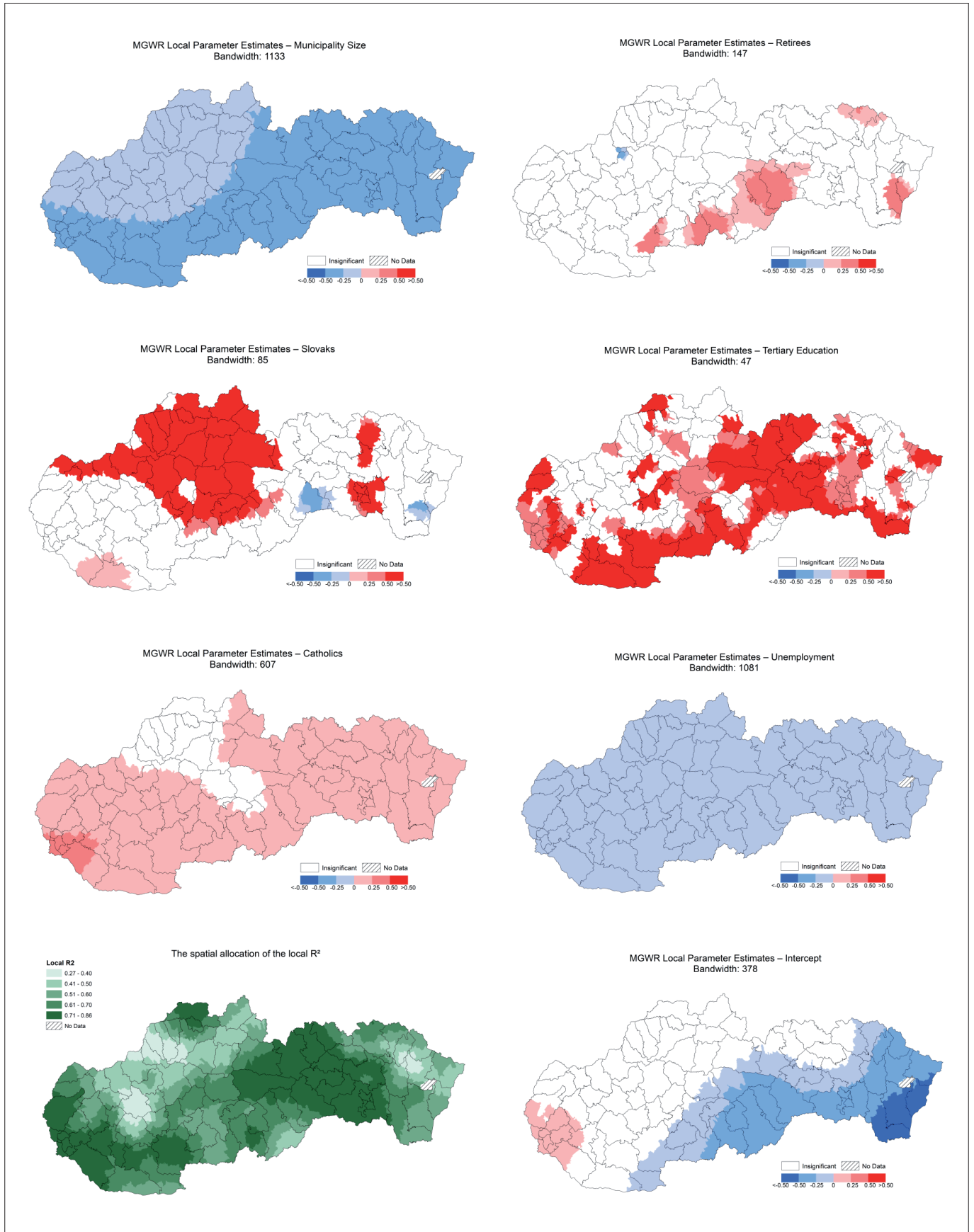


Fig. 6: MGWR Local Parameter Estimates  
Sources: authors' elaboration

consistent. This is, however, to be expected in all local regression modelling to varying degrees (see Shi et al., 2021). Moreover, MGWR also estimates local intercept values which may be the most interesting MGWR output as they essentially measure the effect of the spatial context per se (Fotheringham et al., 2021). This is because the MGWR model provides local intercept values as if all analysed covariates were rendered constant. In our study, local intercept estimates reveal how voter turnout in each municipality would differ as a result of the ‘unmeasurable effects of place’ (Fotheringham et al., 2021). Specifically, the MGWR model assumes that substantial portions of eastern and southern parts of Slovakia have significantly lower voter turnout, while the very western part of Slovakia has a higher electoral turnout (Fig. 6H).

With this being said, logically there are a number of questions that arise: What variables were perhaps excluded from the analysis? In what ways are different regions specific? What subsequent analyses can be conducted to further investigate the identified spatial patterns?

## 6. Discussion

Before discussing our results below, is important to note that the main goal of most studies in quantitative geography is not to achieve flawless research (which is often impossible, especially when dealing with social science data), but rather to maximise knowledge on spatial processes while minimising errors (Fotheringham et al., 2000). Spatial regression modelling can provide both intriguing and ‘expected’ results along with somewhat confusing ones (Suchánek & Hasman, 2022). In addition, by evaluating outcomes stemming from extensive spatial analyses applied on aggregate data, the ecological fallacy must be considered (Spurná, 2008). In this study, however, the added value of the local model when compared to the global model is clearly demonstrated. MGWR proves to be a much better fit, is able to estimate regression coefficients locally, and points to spatial scales upon which different processes operate by utilising unique bandwidths for each covariate.

The first hypothesis (H1) tested the validity of societal modernisation theory, socioeconomic status theory, and theory of disenchanting voting. It relied on education, working in the primary sector and unemployment indicators. The analysis of empirical data showed that a higher proportion of the tertiary educated positively influenced voter turnout. It was also true in the elections studied that voter turnout was higher in municipalities with lower unemployment rates. In contrast, both models suggest no noticeable effect of agricultural workers on electoral turnout.

Consistent with societal modernisation theory, higher voter turnout is found in more economically developed regions, such as Bratislava and its surroundings (Fig. 6H). Comparing these findings with the results of Kostecký (2001), who examined voter turnout in the 1990s, we see a transformation of metropolitan regions from areas with high non-participation to areas with high participation. In the 1990s, when turnout was lower in regions with higher average wages, the theory of disenchanting voting could explain its regional variability. The transformation of the turnout map, together with the transformation of the factors that explain this map, thus convincingly supports the view of Nový (2013). He argues that there has been a change in the explanation of turnout contingency in post-socialist countries because in the 1990s the theory of disenchanting voting had more explanatory power, but that recent elections increasingly confirm the validity of societal modernisation theory.

A fact that limits the explanatory power of societal modernisation theory in interpreting the map of electoral participation in Slovakia is the low turnout in Slovakia's second-largest city, Košice. It is significantly lower than the theory suggests would correspond to

a centre of its size and importance. The delayed transition from the model of the theory of disenchanting voting to the societal modernisation theory model can partly explain the low turnout in Košice. However, a role may also be played by the capital city effect, which encourages an increase in participation in Bratislava more than corresponds to its educational and employed structure, as well as the effect of simple geographical distance, which may lead some voters in the east of Slovakia to believe that the parliament is too far away and the possibility of influencing its decisions too low to make it worthwhile to go to the elections.

The second hypothesis (H2) tested the validity of the mobilisation theory, precisely the question of whether belonging to a particular perceived community, formed based on religion, ethnic homogeneity, or locality, can mobilise for electoral participation. The results confirmed a higher voter turnout in generally smaller municipalities, consistent with citizens mobilising for social control within the municipality, as hypothesised by Knack (1992). The regression models also showed high turnout in municipalities with more people professing the Roman Catholic faith. Last but not least, turnout was shown to be high in municipalities with a higher proportion of Slovaks, which is entirely in line with mobilisation theory. However, it is questionable how much of an impact this has on low voter turnout in municipalities with a higher representation of the Hungarian and Roma minorities, as previous research has shown (Kevický, 2020b; Kevický & Daněk, 2020). Thus, the higher turnout in municipalities with a higher representation of Slovaks may reflect less interest in elections among national minorities.

The third hypothesis (H3) tested the validity of the theory of habitual voting. It hypothesised that retirees are accustomed to voting due to habitual voting from the socialist era (Linek, 2013). Regression models did not conclusively confirm the positive effect of the proportion of retirees in a municipality on voter turnout. However, the validity of the theory of habitual voting in Slovakia is supported by the increased voter turnout in the smallest municipalities. At the same time, however, it should be remembered that the age structure also reflects the influence of other factors, such as educational structure, geographical location or the size of the municipality, and the relationship between voter participation and age is therefore not independent of other conditioning factors. In this sense, the empirical verification of all the hypotheses mentioned above must be considered mediated and conditioned by factors other than those supporting the hypothesis.

Lastly, with regard to the geography of discontent and ‘left behind places’ concepts, we posit that regions with thriving socioeconomic and demographic attributes and places close to prosperous core areas are reporting higher electoral turnout that their peripheral counterparts. Therefore, our outcomes are generally in line with the anticipated theoretical expectations of ‘left behind places’ or the geography of discontent (e.g. Rodríguez-Pose, 2018; Dijkstra et al., 2020; Pike et al., 2023). But this might not always be very obvious. For example, the city of Košice, the second largest city in Slovakia, is reporting a lower electoral turnout than the local regression model would suggest (Fig. 6H). Once an important industrial city, Košice is now experiencing long-term economic stagnation along with some unfortunate ethnic “clashes” inside the city, and to an extent suffers from a geographical isolation from other cores as well (Kerekes, 2018). Arguably, despite Košice being relatively well-off in the region, many voters might feel some sort of discontent or political resentment and therefore be discouraged from participating in elections. However, the nature of our analysis cannot adequately either confirm or reject this hypothetical assumption.

Needless to say, many of the above theoretical concepts are mutually interconnected and relate to each other to varying degrees; therefore, some of the ‘left-behindness’ was already anticipated through associated theoretical perspectives (i.e.

societal modernisation theory, socioeconomic status theory, and theory of disenfranchised voting). It should be noted, however, that the theories analysed are not all-encompassing. As mentioned in the second section, we did not work with theories based on individual data because of the data and method used. Hence, some outliers could be explained by these theories and the qualitative research methods. Nevertheless, to put it simply, that was not the purpose of this study as we utilise methods whose aim is also exploratory in terms of examining broader findings.

## 7. Conclusion

Our study offers several contributions to the nascent literature about the geographical aspects of voter turnout. First, we test the validity of several theories explaining the uneven distribution of voter turnout in the case of Slovak parliamentary elections. We confirm that using advanced spatial statistical methods brings about substantial enhancements to traditional regression modelling. However, we realise that MGWR, despite being superior to the global OLS model in virtually all aspects, is not all-explanatory. As such our model performed better at investigating and explaining turnout in some locations; in others, it performed worse (see also Shi et al., 2021). This could have been caused by various factors common to regression methods such as the MGWR (Suchánek & Hasman, 2022): perhaps some vital variables were omitted from the analysis, or some local mechanisms and processes simply cannot be measured using aggregate data at all. Consequently, these spatial inconsistencies in explaining voter turnout could be analysed in future research not only by employing additional quantitative (both extensive and intensive) analyses but also by utilising qualitative methods situated in specific locations. For instance, individual-level data could be employed to further explore characteristics of electoral behaviour that are elusive when using aggregate units of analysis (e.g. emotional factors). In-depth interviews with representatives in regions with low local  $R^2$  values in our model can also be conducted to potentially provide new insights into the geographical distribution of voter turnout.

Despite these limitations, we were able to find satisfactory answers to all of our set hypotheses. Voter turnout proved to be overall higher in economically and socially prospering localities and regions, such as Bratislava and its neighbouring regions, where the education and economic status of voters is noticeably higher on average – this is in line with societal modernisation theory. Additionally, factors connected to the mobilisation theory also proved to be valuable, as both religious and ethnic identities of voters play a substantial role in electoral turnout. However, in other cases, such as with the share of retirees and potential habitual voting, the outcomes were not overly convincing, and further research is required.

Moreover, although we did not initially establish a separate hypothesis about 'left behind places' and the geography of discontent concepts (see Rodríguez-Pose, 2018; Dijkstra et al., 2020), we are inclined to an overall assumption that they are of vital importance and should be studied in future research. This is especially important as previous studies have predominantly focused on the relationship between 'left-behind places,' geography of discontent, and populist/protest/radical voting (recently, e.g. Suchánek & Hasman, 2023; Urso et al., 2023), but not specifically on abstaining from voting (for a rare exception see Bourdin & Tai, 2022). In our study, we have also identified that territories which can generally be characterised as socioeconomically disadvantaged, peripheral, and in overall decline, report even lower than expected voter turnout (see Fig. 6H). Therefore, the idea of abstaining from voting as a special form of protest vote in 'left-behind places' ought to be studied in more detail and across different contexts. In this regard, future research should also

employ individual-level data because people who abstain from voting may not necessarily be economically struggling themselves, but they may perceive that they live in relative deprivation due to the declining localities they inhabit. Consequently, they may experience a strong sense of discontent, unfairness, and/or resentment (Bourdin & Tai, 2022).

Accordingly, this study could also prove to be of interest to various policymakers. Identifying spatial patterns and investigating fundamental relationships behind voting should provide a solid foundation for those who wish to expand the pool of people participating in the democratic act of voting. Both supporters and opponents of the government and democratic institutions live in territories heavily influenced by decisions proposed and pushed through by said actors, therefore the spatial geographical dimension plays a key role in electoral behaviour (Bourdin & Torre, 2022). Besides, various inequalities between regions, places, and people are closely related to radical and protest voting (e.g. nativist and populist) (see Pike et al., 2023; Rodríguez-Pose et al., 2023). Well-designed policies aimed to reduce such inequalities might prove effective in curbing both. For instance, our research can help policymakers understand where it is important to educate about the importance of democratic elections and what criteria (e.g. level of education; unemployment) are essential for voter participation. It is important to note, however, that the implementation of narrow policy prescriptions based on conventional growth-oriented thinking, which typically favours competitive and dynamic places with high levels of innovation and productivity, needs to be challenged and new complex and alternative approaches that go beyond the limited scope of economic growth, such as addressing issues of belonging and attachment, should be considered (MacKinnon et al., 2022, 40–42).

Lastly, arguably in comparison to other threats liberal and pluralist democracies are facing, and with radical populism and nativism being on the rise, (e.g. Bergmann, 2020; van Leeuwen & Vega, 2021), abstaining from voting might seem rather harmless. Nevertheless, turning away from voting is just one possible outcome of some sort of discontent or political resentment of people living in increasingly polarised societies (Bucci, 2017). It is in our interest to study diverse phenomena related to people's dissatisfaction, whether it is economic, social, or political, regardless of the character of manifestation or perhaps the imagined degree of seriousness. Along with the election of Donald Trump and Brexit (Norris & Inglehart, 2019) in 2016, we have seen many other electoral 'earthquakes' in all parts of the world (e.g. Rybář et al., 2017; Voda & Havlík, 2021). Even if it is virtually impossible to consistently predict such political shocks, it is our task to at least try to understand them.

## References:

- Agnew, J., & Shin, M. (2017). Spatializing populism: Taking politics to the people in Italy. *Annals of the American Association of Geographers*, 107(4), 915–933. <https://doi.org/10.1080/24694452.2016.1270194>
- Anselin, L. (1995). Local Indicators of Spatial Association – LISA. *Geographical Analysis*, 27(2), 93–115. <https://doi.org/10.1111/j.1538-4632.1995.tb00338.x>
- Bergmann, E. (2020). *Neo-nationalism. The Rise of Nativist Populism*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-030-41773-4>
- Birch, S. (2003). *Electoral systems and political transformation in post-communist Europe*. Palgrave.
- Blais, A. (2000). *To vote or not to vote*. Pittsburgh University Press.
- Bourdin, S., & Tai, J. (2022). Abstentionist voting—between disengagement and protestation in neglected areas: A spatial analysis of the Paris metropolis. *International Regional Science Review*, 45(3), 263–292.
- Bourdin, S., & Torre, A. (2022). Geography of contestation: A study on the Yellow Vest movement and the rise of populism in France. *Journal of Regional Science*, 63(1), 214–235.

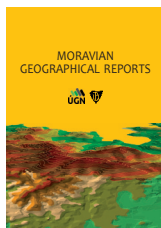
- Brady, H. E., Verba, S., & Scholzman, K. L. (1995). Beyond SES: A resource model of political participation. *American Political Science Review*, 89(2), 271–294. <https://doi.org/10.2307/2082425>
- Bucci, L. C. (2017). White working-class politics and the consequences of declining unionization in the age of Trump. *Politics, Groups, and Identities*, 5(2), 364–371.
- Campbell, A., Converse, P., Miller, W. A., & Stokes, D. (1960). *The American voter*. Wiley.
- Clarke, H. D., Sanders, D., Stewart, M. C., & Whiteley, P. (2009). *Performance politics and the British voter*. Cambridge University Press.
- Cliff, A., & Ord, J. (1981). *Spatial Processes: Models and Applications*. Pion Limited.
- Cupido, K., Fotheringham, A. S., & Jevtic, P. (2021). Local modelling of U.S. mortality rates: A multiscale geographically weighted regression approach. *Population, Space and Place*, 27(1), 1–11. <http://dx.doi.org/10.1002/psp.v27.1>
- Denny, K., & Doyle, O. (2009). Does voting history matter? Analysing persistence in turnout. *American Journal of Political Science*, 53(1), 17–35. <https://doi.org/10.1111/j.1540-5907.2008.00355.x>
- Downs, A. (1957). *An Economic Theory of Political Action in a Democracy*. *Journal of Political Economy*, 65(2), 135–150.
- Fieldhouse, E. (2019). Being a voter: developing a survey instrument for expressive voting. *Journal of Elections, Public Opinion and Parties*, 29, 318–340. <https://doi.org/10.1080/17457289.2018.1530679>
- Fotheringham, A. S. (2023). A Comment on “A Route Map for Successful Applications of Geographically-Weighted Regression”: The Alternative Expressway to Defensible Regression-Based Local Modeling. *Geographical Analysis*, 55, 191–197.
- Fotheringham, A. S., Brundson, C., & Charlton, M. (2000). *Quantitative geography – perspectives on spatial data analysis*. SAGE.
- Fotheringham, A. S., Li, Z., & Wolf, J. W. (2021). Scale, Context, and Heterogeneity: A Spatial Analytical Perspective on the 2016 U.S. Presidential Election. *Annals of the American Association of Geographers*, 111(6), 1602–1621. <https://doi.org/10.1080/24694452.2020.1835459>
- Fotheringham, A. S., & Sachdeva, M. (2022). Scale and local modelling: New perspectives on the modifiable areal unit problem and Simpson’s paradox. *Journal of Geographical Systems*, 24(3), 475–499. <https://doi.org/10.1007/s10109-021-00371-5>
- Fotheringham, A. S., Yang, W., & Kang, W. (2017). Multiscale geographically weighted regression (MGWR). *Annals of the American Association of Geographers*, 107(6), 1247–1265. <https://doi.org/10.1080/24694452.2017.1352480>
- Franklin, M. N. (2004). *Voter turnout and the dynamics of electoral competition in established democracies since 1945*. Cambridge University Press.
- Gordon, I. R. (2018). In what sense left behind by globalisation? Looking for a less reductionist geography of the populist surge in Europe. *Cambridge Journal of Regions, Economy and Society*, 11(1), 95–113. <https://doi.org/10.1093/cjres/rsx028>
- Green, D. P., & Shachar, P. (2000). Habit formation and political behaviour: evidence of consuetude in voter turnout. *British Journal of Political Science*, 30(4), 561–573. <https://doi.org/10.1017/S0007123400000247>
- Havlík, V., & Voda, P. (2021). The rise of populists and decline of others: Explanation of changes in party support in the Czech Republic. *Problems of Post-Communism*, 68(4), 279–291. <https://doi.org/10.1080/10758216.2020.1869906>
- Johnston, R. J. (1987). *Money and votes: Constituency campaign spending and election results*. Croom Helm.
- Jones, K., Johnston, R., Manley, D., Owen, D., & Charlton, C. (2015). Ethnic Residential Segregation: A Multilevel, Multigroup, Multiscale Approach Exemplified by London in 2011. *Demography*, 52, 1995–2019.
- Kerekes, D. (2018). Volby 2016 v Košiciach: priestorová analýza. *Sociológia – Slovak Sociological Review*, 50(1), 31–56.
- Kerwin Kofi, C., & Stephens, M. Jr. (2013). Employment, Wages, and Voter Turnout. *American Economic Journal: Applied Economics*, 5(4), 111–43. <https://doi.org/10.1257/app.5.4.111>
- Keveický, D. (2020a). Priestorové rozloženie volebnej účasti v parlamentných voľbách v slovenských okresoch v rokoch 1990 až 2016. *Geographia Cassioviensis*, 14(1), 64–76. <https://doi.org/10.33542/GC2020-1-04>
- Keveický, D. (2020b). Volebná účasť na Slovensku v roku 2020 z pohľadu geografie – zmena alebo stabilita? *Acta Geographica Universitatis Comenianae*, 65(2), 161–178.
- Keveický, D., & Daněk, P. (2020). Kde sa chodí voliť? Faktory ovplyvňujúce geografické rozloženie volebnej účasti v slovenských parlamentných voľbách. *Geografický časopis*, 72(1), 5–25. <https://doi.org/10.31577/geogrcas.2020.72.1.01>
- Knack, S. (1992). Civic norms, social sanctions, and voter turnout. *Rationality and Society*, 4(2), 133–156. <https://doi.org/10.1177/1043463192004002002>
- Kostadinova, T. (2003). Voter turnout dynamics in post-communist Europe. *European Journal of Political Research*, 42(6), 741–759. <https://doi.org/10.1111/1475-6765.00102>
- Kostecký, T. (2001). Vzestup nebo pád politického regionalismu? Změny na politické mapě v letech 1992 až 1998 – srovnání České a Slovenské republiky. *Sociologický ústav Akademie věd České republiky*.
- Kostecký, T., & Krivý, V. (2015). Urbánno-rurálne rozdiely voličského správania v Česku a na Slovensku. *Sociológia - Slovak Sociological Review*, 47(4), 390–413.
- Krivý, V. (1999). Čo prezrádzajú volebné výsledky? Parlamentné voľby 1992–1998. *Inštitút pre verejné otázky*.
- Li, Z., & Fotheringham, A. S. (2020). Computational improvements to multi-scale geographically weighted regression. *International Journal of Geographical Information Science*, 34(7), 1378–1397. <https://doi.org/10.1080/13658816.2020.1720692>
- Lijphart, A. (1997). Unequal participation: democracy’s unresolved dilemma. *American Political Science Review*, 91(1), 1–14. <https://doi.org/10.2307/2952255>
- Linek, L. (2013). Kam se ztratili voliči?: Vysvětlení vývoje volební účasti v České republice v letech 1990–2010. *Centrum pro studium demokracie a kultury*.
- Linek, L. (2015). Účast ve sněmovních volbách v roce 2013: zdroje, mobilizace a motivace. *European Electoral Studies*, 10(2), 76–90.
- MacKinnon, D., Kempton, L., O’Brien, P., Ormerod, E., Pike, A., & Tomaney, J. (2022). Reframing urban and regional ‘development’ for ‘left behind’ places. *Cambridge Journal of Regions, Economy, and Society*, 15(39), 39–56.
- Madleňák, T. (2012). Regionálna diferenciácia volebného správania na Slovensku (1998–2010). *Veda*.
- Mikuš, R., & Gurnák, D. (2014). Špecifiká volebnej účasti v obciach Košického kraja vo voľbách na rôznych úrovniach v rokoch 1999–2014. *Geographia Cassioviensis*, 8(2), 150–161.
- Norris, P. (2000). *A virtuous circle: Political communications in postindustrial societies*. Cambridge University Press.
- Norris, P. (2002). *Democratic phoenix: reinventing political activism*. Cambridge University Press.
- Norris, P., & Inglehart, R. (2019). *Cultural backlash: Trump, Brexit and authoritarian populism*. Cambridge University Press. <https://doi.org/10.1017/9781108595841>
- Nový, M. (2013). Volební účast a její determinanty ve starých a nových demokraciích Evropy. *Sociológia – Slovak Sociological Review*, 45(2), 195–228.
- Pacek, A. C., Pop-Eleches, G., & Tucker, J. A. (2009). Disenchanted or discerning: voter turnout in post-communist countries. *Journal of Politics*, 71(2), 473–491. <https://doi.org/10.1017/S0022381609090409>
- Pattie, C., Hartman, T. K., & Johnston, R. J. (2019). Not all campaigns are created equal: Temporal and spatial variability in constituency campaign spending effects in Great Britain, 1997–2015. *Political Geography*, 71, 36–46. <https://doi.org/10.1016/j.polgeo.2019.02.010>
- Pike, A., Béal, V., Cauchi-Duval, N., Franklin, R., Kinossian, N., Lang, T., ..., & Velthuis, S. (2023). ‘Left behind places’: a geographical etymology. *Regional Studies*. <https://doi.org/10.1080/00343404.2023.2167972>
- Plešivčák, M., Buček, J., Bačík, V., & Kusendová, D. (2016). Theoretical and methodological notes on current options related to examination of voting behaviour – The geographical approach. *Acta Geographica Universitatis Comenianae*, 60(2), 151–170.
- Reif, K., & Schmitt, H. (1980). Nine Second-Order National Elections – A Conceptual Framework for the Analysis of European Election Results. *European Journal of Political Research*, 8, 3–44. <https://doi.org/10.1111/j.1475-6765.1980.tb00737.x>
- Rodríguez-Pose, A. (2018). The revenge of the places that don’t matter (and what to do about it). *Cambridge Journal of Regions, Economy and Society*, 11(1), 189–209. <https://doi.org/10.1093/cjres/rsx024>
- Rodríguez-Pose, A., Terrero-Dávila, J., & Lee, N. (2023). Left-behind versus unequal places: interpersonal inequality, economic decline and the rise

- of populism in the USA and Europe. *Journal of Economic Geography*, 23(5), 951–977. <https://doi.org/10.1093/jeg/lbad005>
- Rosenstone, S. J., & Hansen, J. M. (2009). *Mobilization, participation, and democracy in America*. Longman.
- Rybář, M., Spáč, P., Voda, P., & Nemčok, M. (2017). *Po stopách politického zemetřesení: parlamentní volby na Slovensku v roce 2016*. Centrum pro studium demokracie a kultury.
- Schulz-Herzenberg, C. (2019). To vote or not? Testing micro-level theories of voter turnout in South Africa's 2014 general elections. *Politikon*, 46(2), 139–156. <https://doi.org/10.1080/02589346.2019.1595879>
- Shi, B., Fu, Y., Bai, X., Zhang, X., Zheng, J., Wang, Y., Li, Y., & Zhang, L. (2021). Spatial Pattern and Spatial Heterogeneity of Chinese Elite Hospitals: A Country-Level Analysis. *Front. Public Health*, 9:710810. <https://doi.org/10.3389/fpubh.2021.710810>
- Solijonov, A. (2016). Voter turnout trends around the world. International institute for democracy and electoral assistance. Retrieved March 17, 2023, from <https://www.idea.int/sites/default/files/publications/voter-turnout-trends-around-the-world.pdf>
- Statistical Office of the Slovak Republic (2023a). 2021 Population and Housing Census. Statistical Office of the Slovak Republic. <https://www.scitanie.sk/en>
- Statistical Office of the Slovak Republic (2023b). Elections and Referenda. Statistical Office of the Slovak Republic. <https://volby.statistics.sk/index-en.html>
- Suchánek, J., & Hasman, J. (2022). Nativist with(out) a cause: a geographical analysis of the populist radical right in the 2017 and 2021 Czech parliamentary elections. *Territory, Politics, Governance*, 1–22. <https://doi.org/10.1080/21622671.2022.2150287>
- Suchánek, J., & Hasman, J. (2023). Geografie nespokojenosti a odporu: časoprostorová analýza volebních výsledků populistické radikální pravice v Česku mezi lety 1992–2021. *Geografie*, 128(2), 203–229. <https://doi.org/10.37040/geografie.2023.008>
- Urso, G., Faggian, A., & Palma, A. (2023). Discontent in the 'peripheries': an investigation of the rise of populism in Italy. *Territory, Politics, Governance*, 11(5), 833–854. <https://doi.org/10.1080/21622671.2023.2189438>
- van Leeuwen, E. S., & Vega, S. H. (2021). Voting and the rise of populism: Spatial perspectives and applications across Europe. *Regional Science Policy and Practice*, 13(2), 209–219. <https://doi.org/10.1111/rsp3.12411>
- Wolfinger, R. E., & Rosenstone, S. J. (1980). *Who votes?* Yale University Press.
- Zhou, X. (2022). Discovering spatial relationships with Multiscale Geographically Weighted Regression [online]. Available at: <https://www.esri.com/arcgis-blog/products/arcgis-pro/analytics/discovering-spatial-relationships-with-multiscale-geographically-weighted-regression/>

**Please cite this article as:**

Kevický, D., & Suchánek, J. (2023). Examining voter turnout using multiscale geographically weighted regression: The case of Slovakia. *Moravian Geographical Reports*, 31(3), 153–164. <https://doi.org/10.2478/mgr-2023-0014>





The Czech Academy of Sciences, Institute of Geonics  
 Palacký University Olomouc, Faculty of Science  
 journal homepage: [www.geonika.cz/mgr.html](http://www.geonika.cz/mgr.html)  
 doi: <https://doi.org/10.2478/mgr-2023-0015>

# Identification of the spatial extent of the peri-urban area: The case of three cities in Poland

Jerzy BAŃSKI <sup>a\*</sup> , Damian MAZUREK <sup>a</sup>

## Abstract

*The work detailed here seeks to recognise features by which areas that can be deemed peri-urban differ from both city and countryside, to the extent that a separate specific identity for them can be discerned. The recognised features made it possible to identify the extent of the peri-urban area. The wealth of relevant literature is first considered, and this is seen to relate to the spatial side and to definition on the one hand, and to ongoing socio-economic processes on the other. Several Polish cities are then selected as the authors seek to discuss indicators useful in determining the spatial scope of the said peri-urban zones. The work proceeds on the assumption that these represent a real component of an urban-rural continuum characterised by reduced diversity and intensity of social and economic phenomena with steadily-increasing distance from the limits of a city in the direction of “traditional” rural areas.*

**Keywords:** peri-urban area, countryside, town, urban-rural relationships, Poland

**Article history:** Received 18 May 2023, Accepted 7 September 2023, Published 30 September 2023

## 1. Introduction

Those travelling out beyond the limits of a city will note how the surrounding landscape transforms gradually. The density of buildings in built-up areas declines, with buildings also lower and lower in height; while the area under cultivation increases, fewer and fewer people are met with, the natural vegetation becomes denser and the range of landscape that can be viewed grows larger. The intensity of change as regards such features and phenomena proves to be greatest in a city’s immediate vicinity, as with further distance covered the differences become less and less visible, before blurring away altogether, as basically speaking we are just in the countryside.

It is clear that the two contrasting categories of settlement – town and countryside – lack a clearly-defined boundary between them, with there instead being a kind of transitional form, known as peri-urban area. Obviously, the aspect both intriguing and troublesome here is that an urban-rural continuum by definition features constant change along it, and hence a lack of boundaries, even as the goal is to somehow delimit what is the peri-urban zone.

The work detailed here seeks to recognise the features allowing for the distinguishing of peri-urban areas – which is to say features allowing a separate identity to be established. This is served by a review of the literature with a significant spatial and historical cross-section, in which the authors recognise the various features of the peri-urban zone. Then, by referring to several large Polish cities as examples, the authors have here been seeking to identify those indicators that can be used to determine the spatial extent of the zone under study. It can be assumed that the identified features will be used in analogous analyses of large urban centers in other

countries of Central and Eastern Europe, where similar development processes are observed after the collapse of the socialist system (e.g. Kocsis, 2015; Slavik et al., 2011; Stanilov & Sykora, 2014).

## 2. Theoretical background

Usually, the city and the countryside are placed at opposite poles representing complexity on the one hand and simplicity on the other, as well as concentration versus dispersion, modernity versus backwardness, artificiality versus naturalness, and dynamism versus stagnation. It is clear that the two contrasting categories of settlement lack a clearly-defined boundary between them, with there instead being a kind of transitional form (Keil, 2018). As we put more and more distance between ourselves and the core parts of a city, the urban features weaken, even as there is a rise in significance of those that can be seen as rural. Furthermore, under our approach, this waning/growing effect would be as much true of the differences in spatial forms as it would be of the ongoing social and economic processes. Therefore, there can be no precisely-defined boundary beyond which urbanity ends and rurality begins (Kule, 2008). Rather, the peri-urban zone is a “belt of transition” all of its own. Indeed, there is a widespread idea that the city and its peri-urban zone form a single organism – a circumstance that obviously precludes any existence of boundaries between them. An example of this is the concept of a Functional Urban Area (FUA) covering the city and its commuting zone.

Equally, there would seem to be still-greater difficulties at the other end, as we seek to designate some limit to the peri-urban zone beyond which it simply blurs with or into rural areas *per*

<sup>a</sup> Institute of Geography and Spatial Organization, Polish Academy of Sciences, Warsaw, Poland (\*corresponding author: J. Banski; e-mail: [jbanski@twarda.pan.pl](mailto:jbanski@twarda.pan.pl))

*se.* The search for this external boundary may obviously benefit from certain ways of defining rural areas, given the existence and presumed presence of features that can only apply to the countryside. Thus the OECD sees rural areas as units of territory ("rural communities") in which the density of population does not exceed 150 inhabitants/km<sup>2</sup>. The issue of settlement typology (e.g. urban centre, suburban grid cell, rural cluster, etc.) is also explored in the Global Human Settlement Layer project, which produces global spatial information on population density and settlement (<https://ghsl.jrc.ec.europa.eu>).

The subject of the shaping and development of peri-urban zones (and the socio-economic processes ongoing within them) was a popular one in the USA, where, even in the first decades of the 20<sup>th</sup> century, the population development of cities was such as to cause peri-urban areas to expand (Burgess, 1924; Harris, 1943; Martin, 1956; Pryor, 1968; and others). Census data for the USA showed that the share of all inhabitants residing in the suburbs increased steadily from 19% in 1940 to 38% in 1970, and then 45% by 1990 (Domański, 2005). It is thus possible to state that Americans are more suburbanites than urbanites, and it is thanks to this that the suburban or peri-urban zone has proved to be of such interest to US-based researchers. Equally, their latest work has tended to focus in on the socio-cultural dimensions to the zones in question (Bruegmann, 2005; Clapson, 2003; Garreau, 1991, Fishman, 1987; Silverstone, 1997; Walks, 2013; Airgood-Obrycki, 2019). The process of shrinking suburban zones, and shrinking towns *per se*, is also noted (Audriac et al., 2012; Neil & Schlappa, 2016; Sarzynski & Vicino, 2019).

Despite a large amount of research, there has never been genuine development of a universally-accepted definition of the peri-urban (or suburban) area, of the features and indicators that might be used in identifying its limits, or of the ways in which urban and rural areas are to be distinguished definitively (Coombes & Raybould, 2001; Hill, 2003; Champion & Hugo, 2004; Hahs & McDonnell, 2006; Forsyth, 2012). Perhaps Forsyth (2012) may have offered the best solution to the definition problem, given the recommendation that a one-off approach be taken each time to a given area, with descriptive terminology used to characterise type and relevant features.

In the face of such a lack of formal definition, practitioners, academics and scientists have devised a series of different methodologies providing for the identification and further

classification of peri-urban space. For their part, Airgood-Obrycki and Rieger (2019) identify three types of approach to the defining process, which they dub: "census-convenient", "suburbanism" or "typology". While the first views the kind of area under discussion as one present outside the city limits but still located within the wider metropolitan area; the second takes account of the form and way of life of inhabitants (by reference to single-family housing, journeys by car, etc.); and the third seeks to categorise areas of different types, through the supply of extra detailed information regarding form of built-up area, location, demography or history.

According to R. Pryor (1968), the suburban zone is characterised by transformations of land use and socio-demographic characteristics, arising out of urbanisation; with the effect being for forms of land management other than the agricultural to develop, as the given area is penetrated by firms operating in the services, and as an influx of new inhabitants is maintained. For example, the issue of land-use forms and specific rules is one way for E. Gottero et al. (2021) to determine the extent of Milan's peri-urban area. R. Pahl (1965), on the other hand, considers this a "mentally urban but physically rural" area. J. Jauhiainen (2013) offers an insight suggesting that, through to the present day, it is most typical to see the suburbs as an extensive if diffuse area adjacent to a city that has lower density of population; limited amounts of industry, commerce and retail sale activity; and "suburban" inhabitants whose lifestyles are modest. At the same time, a historical and spatial consideration of how such areas develop leads to the establishment of a core typology in which we might find: terraced suburbs, villa suburbs, industrial and working-class suburbs, garden suburbs, extended suburbs, gated communities, squatter and shanty-town suburban areas, suburban sprawl and suburban edge cities. And each type referred to has its own defined set of features.

What is it that distinguishes the peri-urban zone from among other categories of area? It is worth noting that earlier studies (from the first half of the 20<sup>th</sup> century) identified features of peri-urban (suburban) areas that were mainly quantitative in nature (Tab. 1), allowing for the possibility of determination by reference to different measures (e.g. density of buildings in the built-up area, density of population, social-class structure, and so on). In contrast, in later decades the interest in qualitative features grew, despite the way in which these can be described rather readily, but only measured with some difficulty (as with aspects like multi-dimensionality, physiognomic instability, interpenetration of different ways of living, etc.).

Author	Features of peri-urban areas
E.W. Burgess (1924)	Dormitory towns, prevalence of single-family construction, large share of middle-class inhabitants
C. D. Harris (1943)	Presence of zones that are multi-functional (residential, residential/industrial, industrial/residential, industrial, mining/industrial),
W. Schärer (1956)	Low-density residential construction, open space
W. L. Martin (1956)	A large share of the population commuting to work in a city each day, a defined density of built-up areas and defined population density
G. A. Wissink (1962)	Dependence on a city from the point of view of services and employment
R. Pryor (1968)	Land-use other than agricultural, penetration of area by potential developers, a steady influx of new inhabitants
J. Beaujeu-Garnier, G. Chabot (1971)	Dormitory towns, with a city as the place in which the population gains its income, presence of city-dependent industrial functions
J. Connell (1974)	Open space, functional linkage with a city (fluctuation migrations), a limited sense of belonging to a local community
S. Leszczycki (1977)	Sources of upkeep other than farming, a dense transport network and urban lifestyle, with physiognomy of settlement also urban
G. Dematteis (1985)	Fuller integration with a city than with other parts of the suburban zone
S. Liszewski (1987)	Interdigitation of urban and rural features and phenomena, processes of concentration (polarisation and agglomeration) and deconcentration (diffusion and deglomeration)
K. Dzięwoński (1987)	A differentiated socio-functional system with lead (typical) features lacking
M. Marsh (1990)	A specific family and neighbourly lifestyle
J. Garreau (1991)	An important role for the residential function, single-family construction
S. Mayhew (1997)	Low density of households, open space, a transport system linking up with the city, a community mainly of just one social class
R. Silverstone (1997)	"multi-dimensional" geographical, architectural and social space
R. Bruegmann (2005)	A defined density of population
L. Poniży (2009)	Physiognomic instability, with interdigitation of urban and rural landscapes
J. Jauhiainen (2013)	Heterogeneity of spatial configurations, with marked differentiation of social, economic and spatial features
W. Airgood-Obrycki, S. Rieger (2019)	Given demographic features to be noted from Censuses, and a characteristic form and period of construction

Tab. 1: A historical perspective on selected examples of peri-urban areas features reported in the subject literature  
Source: author's own elaboration

Certain of the features authors have chosen to identify can be expressed in relation to simple measures (as with the aforementioned densities of buildings and population, as well as the presence of cities and satellite settlements), even as others involve sets of indicators or are not in any way quantitative. Finally, there are also features not manifested by peri-urban zones specifically, but rather being generalised in nature, and hence also capable of relating to areas of other categories. Thus, for example a prevalence of single-family construction is not a distinguishing feature for peri-urban areas alone, given that built-up areas in villages as well as in certain parts of cities may prove to be of the same nature.

A look at the relevant geographical literature shows how work on peri-urban zones is above all focused on the spatial and morphological aspect(s). This ensures that features taken to characterise the areas in question are most often those of amorphous spatial structure, dispersed nature of buildings, low-value indices for the area utilised, intensive drives to build homes with which infrastructural development is unable to keep pace, ribbon forms of development along roads, increasing fragmentation of the landscape, and so on (Brueckner, 2000; Ewing, 2008; Ghani et al., 2014; Sudra, 2016; Szmytkie, 2020).

### 3. Research procedure and study area

A review of the literature points to a diverse range of theoretical and methodological approaches to the issue of peri-urban zones. According to A. Forsyth (2012), relevant definitions to be found there constitute a combination of attributes (often forming a complex index of features), as for example linked to physical, functional, social, process-related and analytical aspects. However, bearing in mind the solutions applied to date, it is possible to draw a distinction between two main (i.e. structural and functional) approaches to the definition of peri-urban areas. While the first pays most attention to socio-economic features separating rural and urban areas, the second relates to economic and social linkage with the city.

The most-widespread attempt at defining or identifying peri-urban zones relates to the structural approach. The properties and nature of the zones in question are in this way expressed

by reference to socio-demographic, physiognomic and economic features. Where the socio-demographic sphere is concerned, categories associated with demography, social structure and lifestyle can be identified; while in the physiognomic sphere researchers focus on features of space, the nature of construction, as well as forms and structures that land use assumes. In turn, in the economic sphere it is possible to note references to features of technical and residential infrastructure, the level of employment, land prices and so on (Tab. 2). In the case of the category of functional features a key role is played by those indicative of the diverse relations pertaining between peri-urban zones and the core urban centre; even as there are no such relations between the zones and rural areas *per se*.

This study primarily used quantitative characteristics based on rich and detailed statistical material. Analysis of the specific features of peri-urban areas is based around a case study involving three of Poland's agglomerations differing in terms of functions, size and location. The localities chosen for the purpose were Warsaw, Poznań and Lublin – which are also seen to differ in terms of their socio-economic potential<sup>1</sup>. The work made use of statistical materials, as aggregated for two types of area, i.e. 2-kilometre (ring) zones around the cities analysed, as well as three successive zones formed by municipalities (*gminas*, LAU 2, local-level administrative units) that are located around the centres in question (Fig. 1).

### 4. Results and discussion

Leaving aside the density of construction within the built-up area, it is population density that is the feature used to define peri-urban areas that is referred to, and studied, most often. The figure for this will usually be higher close to cities than in traditional rural areas (i.e. areas located at a greater distance from a large urban centre), while at the same time being lower than in urban centres. With distance, the values assumed by this measure will be progressively lower, even as the phenomenon is not linear in nature, given that the peri-urban zone is characterised by fluctuating values of rather high intensity. Moreover, the values should and do vary in relation to natural barriers, the courses taken by the main transport routes, the sizes of the urban centres, and other conditioning.

Categories of feature	Zone	Features
Structural	Socio-demographic	<ul style="list-style-type: none"> <li>Population density</li> <li>Social structure</li> <li>Lifestyle (co-occurrence of content and forms of both city and country life)</li> </ul>
	Physiognomic	<ul style="list-style-type: none"> <li>Presence of satellite settlements and towns</li> <li>Density of residential construction</li> <li>Land-use structure</li> <li>Density of single-family housing construction</li> <li>Openness of space</li> <li>Inter-digitation of urban and rural landscapes</li> <li>Land fragmentation index</li> </ul>
	Economic	<ul style="list-style-type: none"> <li>Employment structure</li> <li>Prices of land</li> <li>Conflicts over land use</li> <li>Density of technical infrastructure</li> <li>Residential area</li> <li>Density of the transport network</li> </ul>
Functional	<ul style="list-style-type: none"> <li>Multifunctionality</li> <li>Intensity of commuting or fluctuation-migration</li> <li>Forms and density assumed by the system of public transport</li> <li>Cooperation with a main centre</li> </ul>	

Tab. 2: Diagnostic features for peri-urban areas  
Source: authors' elaboration

<sup>1</sup> Warsaw – capital of the country, 1,861,975 inhabitants, Poznań – capital of Wielkopolska voivodeship (NUTS 2), 541,316 inhabitants, Lublin – capital of Lublin voivodeship (NUTS 2), 331,243 inhabitants, 2023 (source: www.stat.gov.pl, access: July 27 2023)

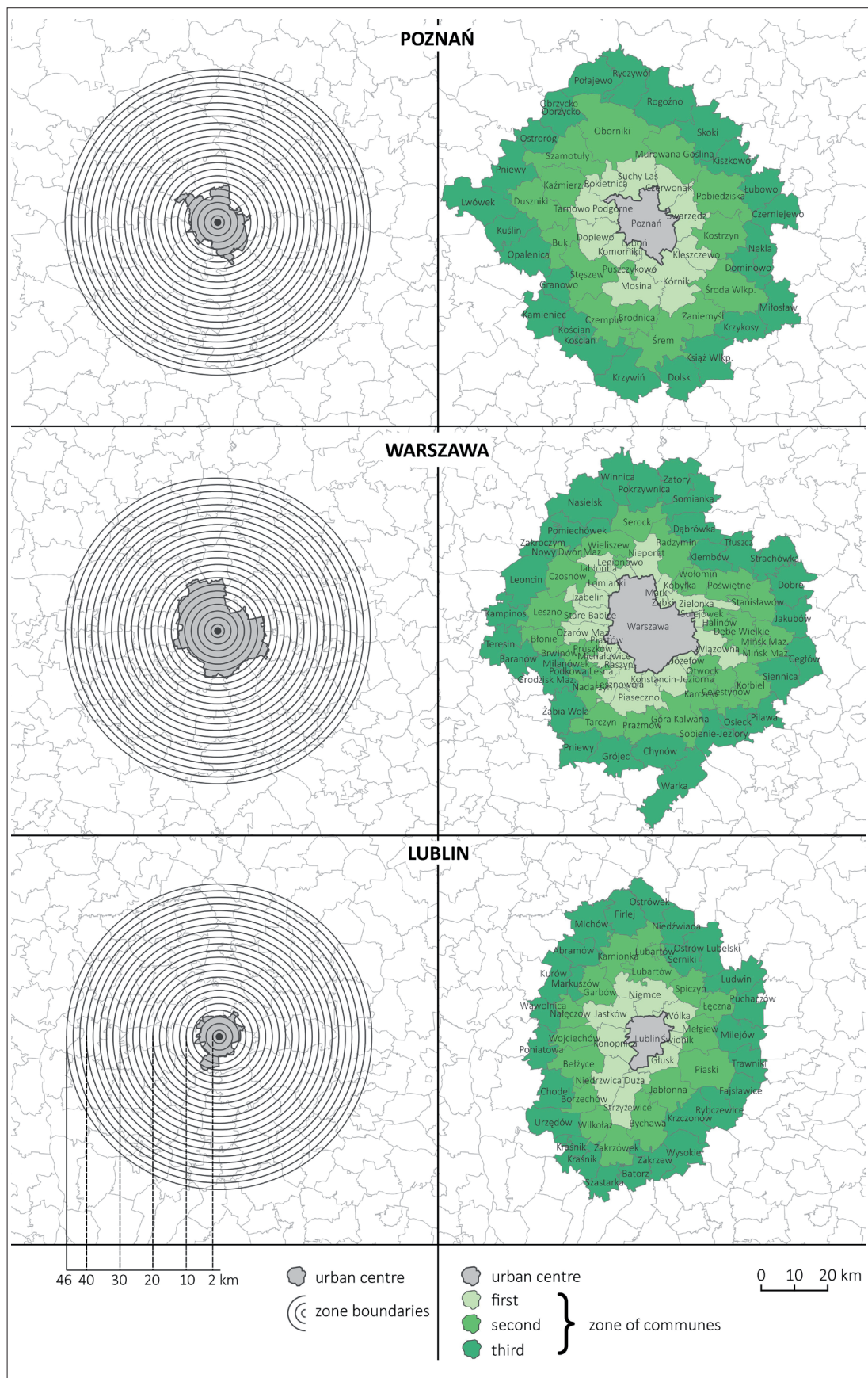


Fig. 1. Two categories of zone located around the urban centres constituting research areas (administrative division 2021)  
 Source: authors' elaboration

#### 4.1 Socio-demographic features

According to research based around the 2021 National Census of Poland, the population density analysed by reference to successive ring-zones of 2-kilometre width around Warsaw is seen to decline dynamically until the zone some 14–16 km from the city centre is reached (Fig. 2). Beyond that, the further decline in population density only proceeds very slowly, to stabilise at a distance some 28–30 km out from the centre of the Polish capital. In the case of the two others, smaller, cities, i.e. Poznań (with its ca. 547,000 inhabitants as of 2021) and Lublin (with a total of around 332,000), the data for population density display a marked downward trend out to the 8–10 km zone. Beyond that, a stabilisation occurs 14–16 km out from the centres. It should therefore be assumed that this indicator can delimit the suburban zones of individual agglomerations, though it will need to be applied along with other measures allowing for verification of the area identified. It may be tempting to pursue analogous analyses for sets of defined city-size categories (as regards number of inhabitants, therefore), with this probably permitting the indication – for each model category – of the ranges of studied zones of variability for the indicator.

Peri-urban areas are usually characterised by positive balances where permanent migration is concerned, albeit with this feature declining steadily with distance from the urban centre. In areas located further out (in a manner relating to city size), the migration balance increasingly assumes values that are markedly negative. It is known that influxes of people into the suburbs largely involve the wealthy and well-educated. These sometimes also transfer the seats of their firms, in this way helping to expand labour-market resources.

The social structure characterising the inhabitants of peri-urban zones is dependent on a country's level of economic development. While in developed countries the peri-urban areas are settled by social groups of average or high social status; in states only weakly-developed those involved are mostly the poorest (present in areas known as slums or *favelas*).

While social structure represents an interesting research topic, it seems that its features cannot define contemporary peri-urban areas, as these are settled by people from different social strata, depending on the type or area and prevalent form of housing construction. According to D. Boorstin (1974), in the era through to the 1960s there was a distinct division present in the peri-urban zones around US cities – in line with standard of living, and in a circumstance whereby the place of residence is linked with the level of income. But the peri-urban zone was mainly a place of settlement for the rich of the WASP (White Anglo-Saxon Protestant) group, though this did not preclude their being enclaves with poorer, less well-educated populations. Later

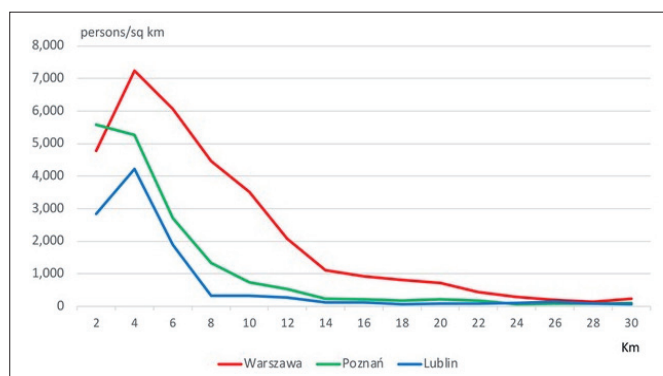


Fig. 2. Changes in density of population in successive rings of 2-kilometre width surrounding the cities as of 2021

Source: author's own elaboration based on data from the National Census 2021, Central Statistical Office (CSO)

years brought a structural assimilation process, of which one result was a flattening-out of the social structure in peri-urban zones – from the point of view of levels of income, education and socio-occupational categories. Similar conclusions were arrived at by Jauhiainen (2013), for whom America's extended suburbs – earlier suburban housing projects mainly targeted at young and prosperous white couples – had their places taken by projects characterised by a more-disparate model involving social and racial segregation.

In Poland, contemporary trends in the development of peri-urban areas result in a change in the social structure in place previously, with an increase in the share of the population that is well-educated and wealthy. An accompanying phenomenon is the polarisation of social classes within the peri-urban zone, which *inter alia* denotes the emergence of closed enclaves inhabited by members of different social classes. These are phenomena mainly observable close to large urban agglomerations.

Lifestyle is a qualitative feature that is not readily measurable. A peri-urban area is characterised by a kind of interweaving of urban and rural models for cultural behaviour (e.g. as regards anonymity and directness, modernity and simplicity, artificiality and naturalness, and so on), as well as specific forms of family and neighbourly life (neighbourly contacts tend to be fleeting and shallow). Individualism is a key aspect of the lifestyle in peri-urban areas, though it is often associated with the opposite kind of behaviour encouraging imitation. It is possible to propose a set of diagnostic features giving expression to ways in which communities in peri-urban areas behave (e.g. form of weekend activity, frequency of departures from home, types and frequencies of use made of transport, etc.). However, the choice of these features and the ways in which results are to be interpreted will inevitably be burdened by subjectivity, even to the point of their being highly subjective. The suburban lifestyle was traditionally linked to daily commutes to work (as a kind of fluctuating migration). This issue is included within the category of functional features.

#### 4.2 Physiognomic features

The sphere of physiognomic features relates to the nature of the space and landscape, the forms that construction takes, and the ways in which land is managed. The measures and indicators used to reveal this include numbers of towns and other settlements of "satellite" status, the density of construction, the degree of openness of the landscape, the level of physiognomic stability, the degree to which construction is in the single-family category, the density of the transport network, the degree to which land fragmentation has taken place, and other features. Particular attention is paid to land-use features (Hersperger et al., 2018; Shaw et al., 2020).

One of the basic physiographic features distinguishing peri-urban areas from other categories relates to the nature of the settlement process that has been ongoing. This is first and foremost manifested in the presence of "satellite" towns or other settlements, though they mainly an issue for large agglomerations. Centres of genuinely satellite status are not considered to arise in the vicinity of smaller urban localities; though the so-called closed (or gated) housing estates do make their presence felt. Elements of these kinds (be they towns or estates) are of point distribution, so by definition do not suit a situation in which the extents of peri-urban zones along a continuum are supposed to be identified. Equally, their presence is characteristic for the peri-urban position along that continuum.

Another key physiognomic feature of peri-urban areas is the form and density assumed by built-up areas. Prevalent among these forms is single-family construction present at lower density (albeit very much correlated with density of population), given that it is this which is responsible for the shaping of the

specific peri-urban landscape. In our case, analysis of the density of construction in built up areas was possible by reference to data in the 2021 Database of Topographic Objects, in relation to consecutive zones 2 kilometres wide arranged concentrically around Warsaw, Poznań and Lublin. The overall conclusion from our analyses is that, around 22–24 km out from the centre of Warsaw (and 14–16 km out from the centres of Poznań and Lublin) a point is reached at which the share of all residential construction that is single-family in status stabilises out at 90–100%. Even then, some fluctuation might occur due to the presence of small urban centres. Also important is the way in which there is a distinct weakening of the tendency for the given index to increase at distances 14–16 km out from Warsaw and 8–10 km out from Poznań and Lublin, this therefore attesting to some kind of “commencement” of the peri-urban zone. The characteristic depiction in Fig. 3 correlates clearly with that in Fig. 2.

A very important feature of peri-urban areas is the intensive drive to construct and build, which relates in particular to single-family housing construction (Hirt, 2007). Thus, work by M. Wesołowska (2005) in the Lublin region showed that the activity in question concentrated in rural areas located within a radius of around 30 km from the city. Distinct zones of enhanced construction activity could also be noted around three other urban centres of sub-regional rank (i.e. Zamość, Chełm and Biała Podlaska) – albeit in these cases within radii of 15–20 km from the respective centres (Wesołowska, 2005). Vibrant expansion of housing is changing the shape of rural settlements, figuratively; and literally – in terms of the spatial configuration existing now as opposed to up to now. New settlements of modern-type houses can be thought to degrade the often-traditional rural landscape. On the other hand, the development of the residential function denotes an improvement in the quality of life in the countryside, thanks to the remodeling and modernisation of both technical and community infrastructure, improved transport access and better quality of services. The consequence of the pressure to build in peri-urban areas is increased demand for land and an associated increase in land prices. A relevant analysis conducted in 2009 around Kraków, Poznań and Warsaw pointed unequivocally to a link with distance from city limits (in the sense that prices of land were lower and lower with increasing distance from a city) (Bański, 2009).

Housing construction is concentrated close to the main transport routes. Along them, there is a belt of enhanced economic activity, given that construction is not the only thing that develops, as trade, services and manufacturing all grow too. This process carries with it a series of undesirable consequences, as a transport system not adjusted to the new situation hinders inhabitants of peri-urban areas when it comes to the access to the city which was the original reason for their presence. This is above all the

case where daily travel to work and access education is involved. It is shown that the inhabitants of peri-urban municipalities may spend more than 10% of their active time each day in morning and evening traffic congestion. This leads us to one of the core (re-emerging) arguments put forward by advocates of residence in more-central areas of cities.

A further feature of peri-urban areas is some kind of inter-digitation (interweaving) of urban and rural landscapes. In the view of A. Richling and J. Solon (1996), the peri-urban landscape is subject to more-dynamic structural and functional change than are either urban or rural landscapes. By reference to components of vegetation, the aforesaid authors propose distinguishing between three types of peri-urban landscape. The first type takes in land linked closely with the city in a functional sense – this denotes an area that has a very far-reaching mosaic of the different components under study. The second type means areas that have already been changed greatly, to the point where typologically and spatially disordered plant communities have taken shape. The third group in turn includes areas only linked in a loose way with the city, in which vegetation components are relatively extensive and stable at the same time.

Overall, the proposal makes rather clear reference to the traditional way in which areas of landscape were summed up as devastated, cultural, natural or primaeval. The peri-urban area is dominated by cultural landscapes (left with only a fragile capacity for self-regulation and much influenced by human economic activity), albeit also with some devastated landscapes (highly urbanised and thus lacking in natural components). The delimitation of areas of this kind is complicated given the need for detailed cartographic processing based on both field studies and GIS-based analysis. However, where appropriate research instruments are available, it proves possible to analyse vegetation present, and then attempt to determine the extent of the peri-urban zone.

A feature of that zone is far-reaching diversification of land-use structure – again as expressed in a mosaic-like arrangement of land of extensive or intensive use. This sees farmland or forest located in the immediate vicinity of land under intensive use in production, housing or commerce (Sovová & Krylová, 2019). The share of land that is built-up is already relatively high, though (in line with the size of the urban locality under consideration) the figure for this rather rapidly becomes lower as we move into successive zones further and further away from the city proper. In the case of Warsaw, the share of land that is built on is seen to stabilise (at a level of several per cent) some 26–28 km from the centre of the capital. Where Poznań and Lublin are concerned, such zones are encountered respectively 18–20 or 14–16 km out from the cities (Fig. 4).

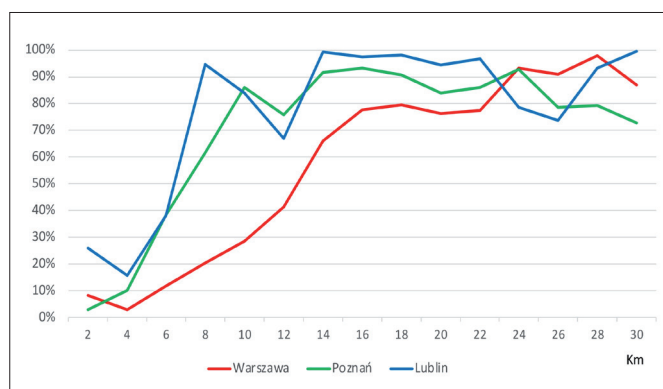


Fig. 3. Percentage share of all residential construction accounted for by single-family housing, as of 2021

Source: author's own elaboration, based on the Database of Topographic Objects, Geoportal ([www.geoportal.gov.pl](http://www.geoportal.gov.pl))

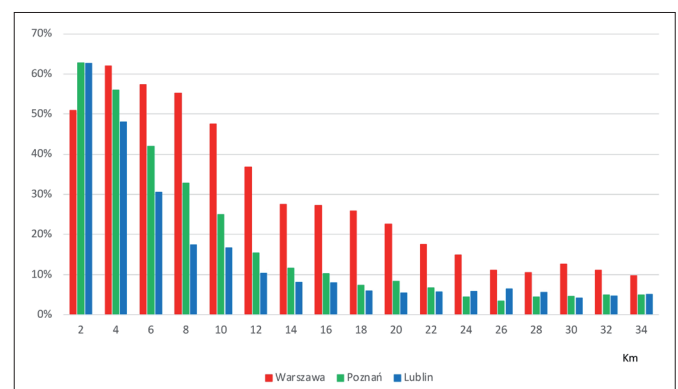


Fig. 4. The proportions of successive zones around the cities studied that were accounted for by built-up areas as of 2021

Source: author's own elaboration, based on the Database of Topographic Objects, Geoportal ([www.geoportal.gov.pl](http://www.geoportal.gov.pl))

### 4.3 Economic and functional features

In general, the peri-urban zone is characterised by the presence of a rather large number of businesses. This fact seems to be confirmed by the way in which municipalities in the immediate vicinities of large agglomerations do manifest positive balances for commutes to work (even as in municipalities further out the balance is definitely negative). This phenomenon characterises all three examined suburban zones. Especially in the case of Warsaw, the differences between the first zone of communes and the other two zones are very large (Tab. 3). It is the result of the intensive settlement process in the communes adjacent to Warsaw, whose new inhabitants are professionally connected with the city.

The diverse suitability of land for a variety of different forms of use ensures that the peri-urban zone is a place of potential conflict over land-use (Alonso et al., 2017; Sarzynski et al., 2014). A typical circumstance of that kind arises where the same space could serve various economic functions, but demand for these valuable features exceeds the actual supply (Bański, 1998). The worst conflicts of land-use tend to break out when the agricultural function clashes with the residential, and this reflects the presence of two irreconcilable interests. While a growing city has a large (indeed expanding) market for food products that can actually stimulate development of intensive commercial variants of farming, urbanisation and urban sprawl are proceeding apace, increasing more and more the demand for new land to be taken out of agriculture in order that it can be built on. However, this is a battle farming is ultimately slated to lose in each case. Over time, the significance of agriculture in the zones must decline, and must retreat in more-peripheral directions. The situation will not be improved by the growing trend of urban farming.

The fact that (relatively) high proportions of peri-urban zones have become built up at the same time denotes a fragmentation of land into far more separate parcels than before – a circumstance confirmed by analysis of their density in consecutive zones further and further out from the centres of Warsaw, Poznań and Lublin. This results first and foremost from the intensive degree to which housing construction has been engaged in, as well as functional diversity and the high level of demand for land that is exerted (Fig. 5).

Zone of municipalities / City	Warsaw	Poznań	Lublin
Zone 1	238,502	64,115	21,158
Zone 2	- 34,231	- 13,102	- 9,566
Zone 3	- 20,674	- 15,827	- 2,440

Tab. 3: Balances for commutes to work characterising the municipalities surrounding the urban centres under study, 2011

Source: author's own elaboration based on data from the National Census 2011, CSO

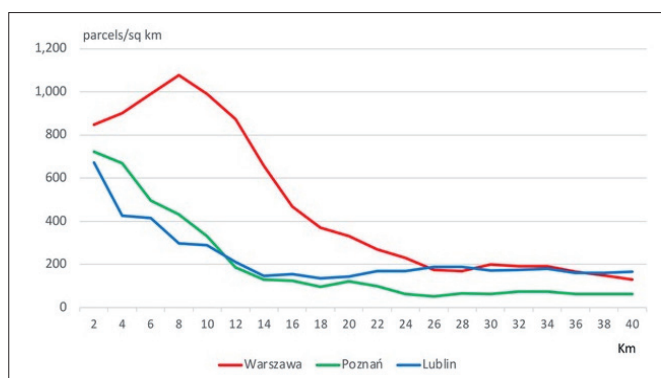


Fig. 5: Numbers of parcels of land per km<sup>2</sup> in consecutive zones around the cities studied as of 2016

Source: author's own elaboration, based on Geoportal data: Land-Parcel Identification System ([www.geoportal.gov.pl](http://www.geoportal.gov.pl))

A peri-urban zone displays far-reaching functional differentiation and strong economic relationships with its city. Multi-functionality is a feature rendering peri-urban zones distinct from rural areas as such (given the leading role in the latter of large-area functions notably farming and forestry). The core functions of areas close to cities in turn include housing, services relating to both production and consumption, agriculture, and recreation. In turn, in cities proper, the above services plus the residential function are joined by social and administrative functions, as well as commerce. Moreover, it is possible to generalise by saying that functions present in cities are intensive by nature and have a point or linear distribution, even as those in the peri-urban zone are present both intensively and extensively, with distributions of the point, linear or areal kinds.

A further key feature of a peri-urban area is the way it links up strongly with its city in both functional and economic terms. This is evidenced by shuttle migrations related to commuting. The intensity of the migratory movement reflects the degree of linkage present between peri-urban zones and the city – in the sense that, the greater that linkage, the stronger the socio-economic links. It is for this reason that the extent of the phenomenon of daily migration can serve to determine the external boundaries of the peri-urban zone. A feature of an area of the latter type (reflecting the intensive daily migrations) is the specific nature of the system of transport, though this is something that is mainly true of large urban centres. It is possible to simplify (greatly) by saying that the extent of suburban bus routes can denote the limits of intensive daily migrations – given the profitability calculations urban transport enterprises are readily able to carry out. In the case of the urban localities under study here, the density of bus lines shows a marked correlation with other diagnostic indicators already analysed above.

The degree of concentration of the transport network is a further feature influenced by the functional and economic linkage pertaining between peri-urban areas and cities (Fig. 6). In the cases of the three such cities analysed, the km-per-km<sup>2</sup> densities of local-authority and county roads decline steadily in consecutive zones as more and more distance from city centres is covered. The values bottom out at a distance 24–26 km out from the centre of Warsaw, while the corresponding figures for Poznań and Lublin are 12–14 and 10–12 km respectively.

## 5. Conclusions

In general, the subject literature is inclined to distinguish two main categories of feature that characterise the peri-urban areas, i.e. the structural and the functional. That said, the first set are further taken as encompassing socio-demographic, physiognomic and economic features. And in each of these groups mentioned

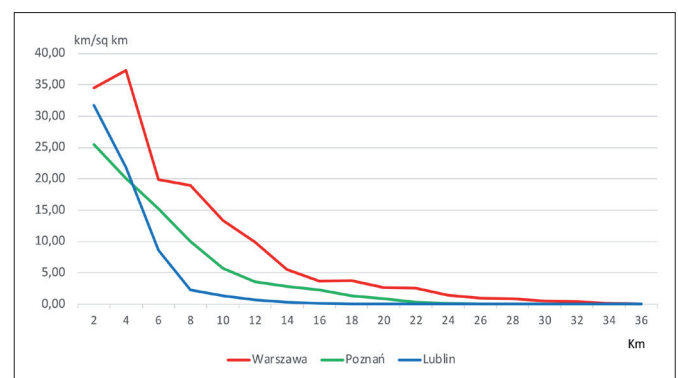


Fig. 6: Densities of bus lines operated by City Transport Boards in the zones surrounding the 3 cities studied, in 2021 (in km-per-km<sup>2</sup>)

Source: author's own elaboration, based on data from OpenStreetMap ([www.openstreetmap.org](http://www.openstreetmap.org))

it is possible to identify diagnostic features to a greater or lesser degree permitting determinations of the spatial extent of peri-urban areas.

The presence of these areas is revealed most fully by reference to such features as the inter-penetration/interweaving of the content and forms characteristic of urban and rural life (styles), the presence or absence of towns and settlements of other sizes enjoying “satellite” status, the occurrence of intensive migration processes of a fluctuating nature, the degree to which an area features single-family construction, and other functional changes of a dynamic nature. Other features studied are also in a position to reveal the separate nature of the peri-urban zones, but not to an extent allowing for their spatial identification.

It is as a consequence of the wide variety of definitions of the peri-urban zone that so many different methods of delimiting it have arisen. When it comes to the functional criterion, the designation of the peri-urban zone makes reference to the range and intensity of commutes to work and the economic functions the given area serves. In contrast, the structural criterion is typically analysed by reference to a set of diagnostic features (encompassing land-use structure; the densities of road networks, buildings in the built-up area, and population; and so on). Threshold values are adopted for all of these.

The degree of development of a peri-urban zone depends on the size of a given city, as well as the socio-economic functions it serves. In the case of the three Polish cities researched here (Warsaw, Poznań and Lublin), analyses conducted allow it to be indicated that the spatial extent of Warsaw’s peri-urban zone goes out as far as some 24–26 km from the city centre. The respective zones for Poznań and Lublin in turn involve distances out to 18–20 and 12–14 km respectively. This is then a phenomenon markedly dependent on the population potential of the centres concerned.

In developed countries, the urbanisation process in rural areas now extends far beyond the peri-urban zone as such, being associated with the process by which metropolitan areas take shape. Involved here is the development of transport and communication systems (both traditional and electronic, or depending on other modern means), as well as the greater accessibility of the core urban centres, and the reduced time needed to commute in to them. It is thanks to this that population is able to migrate from node areas into the countryside or else into smaller urban centres (by means of the phenomenon of de-urbanisation). This is generally a process impacting favourably upon rural areas, given that it reduces urban-rural disparities. In the face of the accelerated development of countries in general and Poland in particular, it is possible to anticipate a major upcoming expansion of the peri-urban zones around the largest cities. However, there may be a number of unfavourable aspects to this abrupt development, such as a lack of spatial order, difficulties with transport and communications (above all excessive commuting times where work and school are concerned), degradation of the landscape, and a worsening pollution problem. In this connection, it is to be expected that spatial policy seeking to maintain or restore order will face even greater challenges than have been observed to date. Some efforts are already underway and are aimed at balancing the urban-rural or core-periphery relationship. This is primarily about metropolitan areas, which are becoming separate territories with autonomous planning and strategic development.

## Acknowledgments

*This publication has been made ready as part of the Research Project from the National Science Centre of Poland assigned the number UMO-2019/35/B/HS4/00114, and entitled Diagnostyka współczesnej struktury społeczno-gospodarczej i klasyfikacja*

*funkcjonalna małych miast w Polsce – w poszukiwaniu rozwiązań modelowych (Diagnosis of the contemporary socio-economic structure and functional classification of small towns in Poland – in search of model solutions).*

## References:

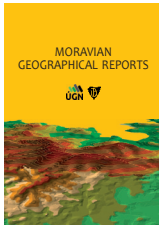
- Airgood-Obyrcycki, W. (2019). Suburban status and neighbourhood change. *Urban Studies*, 56(14), 2935–2952. <https://doi.org/10.1177/0042098018811724>
- Airgood-Obyrcycki, W., & Rieger S. (2019). Defining Suburbs: How Definitions Shape the Suburban Landscape. President and Fellows of Harvard College.
- Alonso, N., Muniz, I., Aja, A., & Garcia, F. (2017). Challenges for the revitalisation of peri-urban agriculture in Spain: Territorial analysis of the Madrid and Oviedo metropolitan areas. *Moravian Geographical Report*, 25(3), 192–207. <https://doi.org/10.1515/mgr-2017-0017>
- Audirac, I., Cunningham-Sabot, E., Fol, S., & Moraes, S. T. (2012). Declining suburbs in Europe and Latin America. *International Journal of Urban and Regional Research*, 36, 226–244. <https://doi.org/10.1111/j.1468-2427.2011.01093.x>
- Bański, J. (1998). Gospodarka ziemią w Polsce w okresie restrukturyzacji, Projekt badawczy, Gospodarka ziemią w okresie restrukturyzacji i wchodzenia do struktur europejskich. IGiPZ PAN, Warsaw.
- Bański, J. (2009). Odrębność obszaru podmiejskiego w kontinuum miejsko-wiejskim, *Czasopismo Geograficzne*, 80(4), 210–228.
- Beaujeu-Garnier, J., & Chabot, G. (1971). *Zarys geografii miast*. PWE, Warsaw.
- Boorstin, D. (1974). *The Americans. The Democratic Experience*, Vintage Books.
- Bruegmann, R. (2005). *Sprawl, a compact history*, The University of Chicago Press.
- Brueckner, J. K. (2000). Urban sprawl: diagnosis and remedies. *International Regional Science Review*, 23(2), 160–171. <https://doi.org/10.1177/016001700761012710>
- Burges, E. W. (1924). The growth of the city: an introduction to a research project, *Publications of the American Sociological Society*, 18, 85–97.
- Champion, T., & Hugo, G. (2004). Introduction: Moving beyond the urban-rural dichotomy. In T. Champion & H. Graeme (Eds.), *New Forms of Urbanization: Beyond the Urban-Rural Dichotomy* (pp. 3–24). Ashgate.
- Clapson, M. (2003). *Suburban Century: Social Change and Urban Growth in England and the USA*. Berg.
- Connell, J. (1974). The Metropolitan Village: Spatial and Social Processes in Discontinuous Suburbs. In J. H. Johnson (Ed.), *Suburban Growth Geographical Processes at the Edge of the Western City*. (pp. 77–100). J. Wiley & Sons.
- Coombes, M., Raybould, S. (2001). Public policy and population distribution: Developing appropriate indicators of settlement patterns. *Environment and Planning C: Government and Policy*, 19, 223–248. <https://doi.org/10.1068/c9826>
- Dematteis, G. (1985). Strefa podmiejska Turynu. *Acta Universitatis Lodziensis, Folia Geographica*, 5, 179–194. <https://doi.org/10.7163/SOW.47.5>
- Domański, R. (2005). *Geografia ekonomiczna. Ujęcie dynamiczne*. PWN.
- Dziwowski, K. (1987). Strefa podmiejska – próba ujęcia teoretycznego. *Przegląd Geograficzny*, 59, 55–63.
- Ewing, R. H. (2008). Characteristics, causes, and effects of sprawl: A literature review. In J. M. Marzluff et al. (Eds.), *Urban Ecology* (pp. 519–535). Springer. [https://doi.org/10.1007/978-0-387-73412-5\\_34](https://doi.org/10.1007/978-0-387-73412-5_34)
- Fishman, R. (1987). *Bourgeois Utopia: The Rise and Fall of Suburbia*. Basic Books.
- Forsyth, A. (2012). Defining Suburbs. *Journal of Planning Literature*, 27(3), 270–281. <https://doi.org/10.1177/0885412212448101>
- Garreau, J. (1991). *Edge city: life on the new frontier*. Doubleday.
- Ghani, N. L. A., Abidin, S. Z., & Khalid, N. E. A. (2014). Urban sprawl shape description. *Malaysian Journal of Computing*, 2(1), 27–36.
- Gottero, E., Larcher, F., & Cassatella, C. (2023). Defining and Regulating Peri-Urban Areas through a Landscape Planning Approach: The Case Study of Turin Metropolitan Area (Italy). *Land*, 12(1), 217. <https://doi.org/10.3390/land12010217>



- Hahs, A. K., & McDonnell, M. J. (2006). Selecting independent measures to quantify Melbourne's urban-rural gradient. *Landscape and Urban Planning*, 78, 435–448. <https://doi.org/10.1016/j.landurbplan.2005.12.005>
- Harris, C. D. (1943). Suburbs. *American Journal of Sociology*, 49(1), 1–13.
- Hersperger, A. M., Oliveira, E., Pagliarin, S., Palka, G., Verburg, P., Bolliger, J., & Grădinaru, S. (2018). Urban land-use change: The role of strategic spatial planning. *Global Environmental Change*, 51, 32–42. <https://doi.org/10.1016/j.gloenvcha.2018.05.001>
- Hill, M. (2003). *Rural Settlement and Urban Impact on the Countryside*. Hodder and Stoughton.
- Hirt, S. (2007). Suburbanizing Sofia: Characteristics of Post-Socialist Peri-Urban Change. *Urban Geography*, 28(8), 755–780. <https://doi.org/10.2747/0272-3638.28.8.755>
- Jauhainen, J. S. (2013). Suburbs. In P. Clark (Ed.), *Oxford Handbook on Cities in History*. Oxford University Press.
- Keil, R. (2018). After Suburbia: research and action in the suburban century. *Urban Geography*, 41(1), 1–20. <https://doi.org/10.1080/02723638.2018.1548828>
- Kocsis, J. (2015). Patterns of urban development in Budapest after 1989. *Hungarian Studies*, 29(1–2), 3–20. <https://doi.org/10.1556/044.2015.29.1-2.1>
- Kule, L. (2008). Concepts of rurality and urbanity as analytical categories in multidimensional research, *Proceedings of The Latvian Academy of Sciences. Section B*, 62(1–2), 9–17. <https://doi.org/10.2478/v10046-008-0004-3>
- Leszczyki, S. (1977). *Geografia a planowanie przestrzenne i ochrona środowiska*. Państwowe Wydawnictwo Naukowe.
- Marsh, M. (1990). *Suburban lives*. Rutgers University Press.
- Martin, W. L. (1956). The Structuring of Social Relationships Engendered by Suburban Residence. *American Sociological Review*, 21, 446–453.
- Mayhew, S. (1997). *Dictionary of Geography*. Oxford University Press.
- Neill, W. J. V. & Schlappa, H. (Eds.) (2016). *Future Directions for the European Shrinking City*. Routledge.
- Pahl, R. (1965). Class and community in English commuter villages. *Sociologia Ruralis*, 5, 5–23.
- Ponizy L. (2009). Zagadnienia turystyczne w dokumentach planistycznych w aspekcie uwarunkowań przyrodniczych gmin powiatu poznańskiego. *Problemy Ekologii Krajobrazu*, 25, 165–174.
- Pryor, R. (1968). Defining the Rural-Urban Fringe. *Social Forces*, 47(2), 202–215.
- Richling, A. & Solon, J. (1996). *Ekologia krajobrazu*. Wydawnictwo Naukowe PWN.
- Sarzynski, A., Galster, G., & Stack, L. (2014). Typologies of sprawl: investigating United States metropolitan land use patterns. *Urban Geography*, 35(1), 48–70. <https://doi.org/10.1080/02723638.2013.826468>
- Sarzynski, A., Vicino T. J. (2019). Shrinking Suburbs: Analyzing the Decline of American Suburban Spaces, *Sustainability*, 11, 5230. <https://doi.org/10.3390/su11195230>
- Schärer, W. (1956). *Die Suburbane von Zurich*. *Geographica Helvetica*, 11, 1–46.
- Shaw, B., van Vliet, J., & Verburg P. (2020). The peri-urbanization of Europe: A systematic review of a multifaceted process. *Landscape and Urban Planning*, 196, 1–11. <https://doi.org/10.1016/j.landurbplan.2019.103733>
- Silverstone R. (Ed.) (1997). *Visions of Suburbia*, Routledge.
- Slavík, V., Grác, R., Klobučník, M., & Kohútová, K. (2011). Development of Suburbanization of Slovakia on the Example of the Bratislava Region, In T. Marszał (Ed.), *Urban Regions as engines of Development* (pp. 35–58). Polish Academy of Science.
- Sovová, L. & Krylová, R. (2019). The countryside in the city? Rural-urban dynamics in allotment gardens in Brno, Czech Republic, *Moravian Geographical Reports*, 27(2), 108–121. <https://doi.org/10.2478/mgr-2019-0009>
- Stanilov, K., & Sýkora, L. (Eds.) (2014). *Confronting suburbanization: urban decentralization in postsocialist Central and Eastern Europe*. John Wiley & Sons.
- Sudra, P. (2016). Zastosowanie wskaźników koncentracji przestrzennej w badaniu procesów urban sprawl. *Przegląd Geograficzny*, 88(2), 247–272. <https://doi.org/10.7163/PrzG.2016.2.6>
- Szmytkie, R. (2020). The impact of residential suburbanization on changes in the morphology of villages in the suburban area of Wrocław, Poland. *Environmental & Socio-economic Studies*, 8(4), 24–43. <https://doi.org/10.2478/enviro-2020-0021>
- Walks, A. (2013). Suburbanism as a Way of Life, Slight Return. *Urban Studies*, 50(8), 1471–1488. <https://doi.org/10.1177/0042098012462610>
- Wesołowska, M. (2005). Rozwój budownictwa mieszkaniowego a przemiany przestrzenne wsi województwa lubelskiego. *Studia Obszarów Wiejskich*, 10, 139–155
- Wissink, G. A. (1962). *American Cities in Perspective, With Special Reference to the Development of Their Fringe Areas*. Van Gorcum.

**Please cite this article as:**

Bański, J., & Mazurek, D. (2023). Identification of the spatial extent of the peri-urban area: The case of three cities in Poland. *Moravian Geographical Reports*, 31(3), 165–173. <https://doi.org/10.2478/mgr-2023-0015>



## SCIENTIFIC COMMUNICATION

## In memory of Stanislav Martinát (1976–2023)

Bohumil FRANTÁL <sup>a,f,\*</sup> , Stephan BARTKE <sup>b</sup> , Justyna CHODKOWSKA-MISZCZUK <sup>c</sup> ,  
 Oleg GOLUBCHIKOV <sup>d</sup> , Bryn GREER-WOOTTEN <sup>e</sup> , Pavel KLAPKA <sup>f</sup> , Petr KLUSÁČEK <sup>a</sup> ,  
 Robert KRZYSZTOFIK <sup>g</sup> , Marián KULLA <sup>h</sup> , Miroslava ONDRÁČKOVÁ <sup>e</sup>,  
 Martin J. PASQUALETTI <sup>i</sup> , Dan VAN DER HORST <sup>j</sup>

**Abstract**

*On Sunday, August 13, 2023, Stanislav Martinát – a respected Czech geographer and member of the Editorial Board of Moravian Geographical Reports journal – died after a short serious illness at the age of 47. Despite his relatively young age, Stanislav Martinát was one of the most productive and the most cited Czech geographers. He is the author or co-author of over 100 peer-reviewed articles, of which more than 70 were published in journals indexed in the Web of Science database. This article is a collection of personal memories from people from different workplaces from several countries who had the opportunity to work with Stanislav (Standa) and to share a part of their life stage with him.*

**Keywords:** Stanislav Martinát, In memoriam, Czech Republic

**Article history:** Received 15 September 2023, Accepted 25 September 2023, Published 30 September 2023

**Legends never die****(A memory from Pavel Klapka)**

Standa left us on August 13, which had been quite a shock for me, and memories of him and wisecracks he had used have come back to me virtually every day since. I met Standa in 1996, on the first day when we had started our university studies in geography. Well, not the very first day because Standa spent the first week rambling around pubs in the city of Brno, enjoying the student life. We immediately became close friends, we were roommates in college, I was his best man at their wedding with Ilona (a schoolfellow of ours as well), we shared an office at the Institute of Geonics, and I was happy to have him teaching at the department of geography, Palacký University Olomouc. Even

though after he had moved to Arizona and then to Wales and our personal meeting were rare, we always talked as if we had seen each other just the day before.

I will miss Standa greatly and still cannot believe that he is no longer with us. I will always remember him for several things. His sense of humour resembled something of the funniest mix of Monty Python and fictional Czech genius Jára Cimrman, but quite original – dry and absurd wit, which we used to call ‘Standa’s humour’, for some hard to get.

Standa was a positive person, Standa was an optimistic person, both these traits of his were so true and believable that he managed to hide even from his closest friends that he is battling very serious illness, always saying ‘I’m OK’, ‘It’s getting better’,

<sup>a</sup> Institute of Geonics, The Czech Academy of Sciences, Brno, Czech Republic (\*corresponding author: B. Frantál; e-mail: [bohumil.frantal@ugn.cas.cz](mailto:bohumil.frantal@ugn.cas.cz))

<sup>b</sup> German Environment Agency, Dessau-Rosslau, Germany

<sup>c</sup> Department of Urban and Regional Development Studies, Nicolaus Copernicus University in Toruń, Poland

<sup>d</sup> School of Geography and Planning, Cardiff University, UK

<sup>e</sup> York University, Toronto, Canada

<sup>f</sup> Department of Geography, Faculty of Science, Palacký University Olomouc, Czech Republic

<sup>g</sup> Institute of Social and Economic Geography and Spatial Management, University of Silesia, Poland

<sup>h</sup> Institute of Geography, Faculty of Science, Pavol Jozef Šafárik University in Košice, Slovakia

<sup>i</sup> School of Geographical Sciences and Urban Planning, Arizona State University, Tempe, USA

<sup>j</sup> School of Geosciences, University of Edinburgh, UK

‘When I get well, I’ll go to see you, mates, in Brno or Olomouc...’ Standa was a mild person hating and avoiding conflicts, always trying to settle both academic disputes and pub quarrels. Standa was a loving and devoted husband and father. Standa was always ready to give hand selflessly both in personal and academic life. For me, Standa was a true friend, one of the best in my life. And, with regard to what I know now about last months of his life, Standa was also a brave man!



Fig. 1: Standa and P. Klapka during a trip to Vienna in December 2010  
Photo: P. Klapka

## Ecce homo from coal mining region!

(A memory from Petr Klusáček)

I had the honour to work with Standa at the Institute of Geonics for more than 20 years. We both started as PhD students about the beginning of the third millennium to successfully work our way through the next intermediate stages (post-doc fellow, research assistant and research scientist) up to the highest possible position of senior scientists. Standa can be remembered from many different perspectives. I will personally remember him primarily as a regional patriot being proud of his origins in the coal mining region, and as an extremely communicative and hard-working mate endowed with a great optimism and life energy, with a broad knowledge of various disciplines.

In 2002, Standa and I started working on a research project dealing with the effects of the decline of coal mining on the environment in the Ostrava region. Standa, who came from this region with a long tradition of coal mining and heavy industries (he was born in Havířov city to the miner’s family), introduced me to many hidden beauties of this region, which was practically unknown to me at the time. For example, we had visited the Lower Vítkovice industrial complexes long before this site became the most visited regional monument that even sought to be listed among the UNESCO’s World Heritage Sites. Furthermore, I had an opportunity to admire the leaning Church of St. Peter of Alcantary (the last remnant of the old town of Karviná, which was destroyed by undermining) at a time when this church was quite unknown to the Czech public, as it became famous now thanks to the popular novel ‘The Leaning Church’ by Karin Lednicka. Of course, Standa showed me also places little explored by tourists, such as the monumental architecture in the style of socialist realism in Poruba municipal district – not far from the headquarters of the Institute of Geonics in Ostrava. He also liked to admire a nice view of Lysá Hora mountain from the Institute’s headquarters. Standa was very fond of the Beskydy Mountains, since – as he pointed out – one part of his family came from these mountains to the city for work, and he often visited his parents’ cottage in the mountains.

Standa was duly proud of his coal region and he was able to show visitors not just the beautiful places, but also to present and eruditely speak about places with serious problems, such as the oil lagoons in Ostrava (one of the hugest ecological burdens in the country) or socially excluded localities in Hrušov quarter. As part of one international project, he organised a field excursion to a socially excluded locality inhabited mainly by Roma minorities in Ostrava and I can still remember the shocked faces of some foreign participants when Standa – with his typical smile – prompted them to get off the bus and take a walk through the area. There was a sunny weather and many locals were enjoying the beautiful day in front of their houses on various pieces of furniture pulled right out on the street. After all, most of the participants enjoyed the walking tour very much!

In my opinion, a positive relationship to his native region has been reflected even in his relationship to Brno city, where he studied and then lived for several years. Sometimes Standa characterised it in a way critically as a “city with a bourgeois character with many cafés for intellectuals”. Perhaps also for that reason, he later moved with his family back to his “proletarian” coal region. They built their own house on the outskirts of Frýdek-Místek city, from where he was commuting daily through the mining landscape formed by the Paskov mines to work in Ostrava and also to lecture at the university in Karviná. Standa was not only an expert on his native region, but he also understood the people living there. This understanding was manifested, among other things, by that he was able to present results of his geographic research successfully not only to colleagues from other disciplines (e.g., mathematicians or mining engineers), but also to other people working at our Institute, including technicians, maintenance workers or cleaners.

Standa was a man with an extreme knowledge of various disciplines that had probably something to do with the fact that he studied history in addition to geography as part of the master’s degree. Although he did not continue his doctoral studies in history and devoted himself only to geography, his relationship to history never disappeared. During his business trips abroad, he was interested in places where historical events were written and where some iconic buildings were located, whether it was New York City or Istanbul. Even during his business trips it was evident how extremely communicative and literally brimming with life energy he was. While many other people were tired after full day of demanding meetings and discussions and they directed their steps to the quiet of their hotel rooms, Standa was thinking up other social activities in the evening. Many times I was quite tired



Fig. 2: Standa (in white polo-shirt) with mates from the Institute of Geonics at a trade union social event (bowling tournament) in Komorní Lhotka, November 2002  
Photo: E. Kallabová

after a long day of meetings and preferred to relax alone reading or just watching sports on TV, but Standa convinced me that it is important to socialise and use the time for discussing new project proposals or shaping concepts for future common papers.

Standa was an extremely efficient and hardworking colleague. In relation to research projects, these qualities manifested in such a way that even as an ordinary member of the team he actively participated in the preparation of interim and final reports, which is among the activities being not very appreciated in the evaluations in today's academic world. His approach to research projects implementation can be described as above-standard professional. He devoted a lot of time and energy to implementation of results and sustainability of deliverables of applied research projects even after their completion. In the field of publishing, his diligence was evident in his willingness to take incredibly long and patient revisions of manuscripts. In the case of one of our recent papers, the manuscript had to be revised seven times. While most of the co-authors liked to give up (they didn't want to deal with new and further comments from referees which were sometimes irrelevant from the perspective of geography) and preferred to submit it to different journal, Standa convinced them that the manuscript should be continuously revised while there was still a chance. And finally, this geographical article was accepted and published in a prestigious sociological journal thanks to his diligence and correct scientific effort! Despite many successes in the field of grants and publications, Standa has remained modest and it was pleasant to work with him also because a scientific fame never entered his head.

In conclusion, I have to say that, unfortunately, not just an excellent geographer, but above all a great person and friend has left us forever. Standa – your erudition, scientific enthusiasm and human smile will be greatly missed by all of us! Rest in peace.

## Making friends, crossing borders, staying grounded

*(A memory from Dan van der Horst)*

I first met Stanislav Martinat, along with Bohumil Frantal on the platform of Brno bus station in 2010. Despite the contrasting hair styles, they worked like a great team; down to earth and welcoming but also well organised and focused. I was honoured to be invited and curious to see a new place and meet new people, but I had no idea it would be more than a one-off.

More than a dozen years later and Standa's smiling face is the first thing you see when you open my page on google scholar; he stands at the top of my list of co-authors. The algorithm is correct; it has been the longest and biggest academic collaboration in my career. But the numbers hide the process; Standa was not my co-author; mostly I was his. Or 'theirs' to be more precise, but with Standa acting as interlocutor. He often invited me to contribute to papers that were already drafted, or even papers that had already been accepted by journals subject to revisions. I helped to sharpen introductions and conclusions, to clarify some of the terminology and add more local context for the benefit of foreign readers like myself. But I never really had to touch the contents, question the analysis or make significant additions to the literature review; the work was always very solid and the logic crystal clear. Standa would have politely disagreed if I had said this, but in truth it felt as if my most valuable contribution was that of an English language editor.

It helped my own CV and citations of course. Most of the papers are in good international journals, including some where I had aspired to publish in but never managed before on my own. But mostly I did it because I really liked working with Standa and his Geonics colleagues, personally and academically. I learned a lot about the post-socialist transition and the huge disruptions it brought to rural communities, land use and the agricultural



*Fig. 3: At the westernmost point of the Czech Republic on the border with Germany, October 2016. From the left: S. Martinát, D. van der Horst, J. Kunc, Z. Szczyrba and B. Frantál)  
Photo: B. Frantál*

sector. My research focuses on the (just) transition to a low carbon society but in the rural parts of post-socialist countries, this can be seen as yet another externally-driven systemic change, inflicted on the people and the landscape. Post-socialist brownfield sites bear witness to the disruptive and often destructive nature of this change, but also open up ('cheap') land for the capture of renewable energy from the wind and sun. Equally symbolic are the biogas plants; they are a permitted (and allegedly green) development which allowed agricultural businesses to keep growing maize for local non-human consumption after EU accession had led to the decimation of Czech cattle industry. The work of Standa and his colleagues provided novel, clear and thought-provoking evidence of the uneven geographical distribution of these disruptions; evidence which was very much under-reported in the international academic literature at the time. Their surveys often provided insights into how rural citizens struggled to make sense of (and make a living despite) these changes and how they reflected on the underlying justice questions; how are local communities affected, who actually benefits from these 'investments' and to what extent should policy schemes and development projects be changed to ensure more sustainable and locally fair outcomes; socially, environmentally and economically.

Working with Standa and his colleagues, I learned to recognise my own academic privileges (e.g. more generous UK salaries, ease of having to work and publish only in one language, easier to publish UK studies in international journals with many UK academics on the editorial board). But more importantly I grew to admire how this new generation of academics managed to grow and develop in a far more challenging landscape, with very few senior professors to provide relevant coaching and guidance (communism didn't exactly promote independent and critical social science), with state funding assessed strictly through natural science performance indicators and with new and harsh 'Publish in English or Perish' expectations. I appreciated their outward facing nature, balanced with an element of regional pride (as in the title of MGR). And I developed a lot of respect for the attitude embodied by Standa; why compete if you can collaborate; always aim for the sky, and when you succeed, don't make a fuss about it.

We collaborated in Czech and European projects, he gave great guest lectures to my students, and we caught up at various conferences and workshops across Europe. But my fondest memories are from travelling with Standa and his colleagues, across Czech regions and border lands in the heart of Europe, visiting energy projects and discussing politics, history and

academic life over hearty regional dishes in pubs that had been carefully selected after asking a good sample of locals where ‘dobře pivo’ was being served (I thought all Czech beer was good). He was a decade younger than I, always easy going, up-beat and engaging. I was very impressed by his achievements and proud to call him a colleague and friend. I thought the next collaboration would come just as easily and naturally as the previous one, and perhaps more so now that he had a permanent contract in Aberdeen, at the James Hutton Institute where I had done my PhD and where we had colleagues in common. I deeply regret not having made the most of our friendship and I will miss him for a long long time.

### **A citizen of the world, full of geography in his biography**

*(A memory from Oleg Golubchikov)*

The loss of Stanislav (Standa) is hard to believe. He was just always so full of life, full of activities, and full of optimism. His optimism was inspiring and reassuring, even in hard times. Even talking of his own illness, at the peak of it in June, he wrote to me: “I think that the situation will improve, I’m sure about that”. On the 11<sup>th</sup> of August, two days before the end of his life, his message was still stoic: “I’m good (with ups and downs).” Who knew this would be the last I heard from him.

I first met Standa in 2013, on the introduction of Dan van der Horst. But it was five years later, when he started his fellowship at our School at Cardiff University, that we got to know each other better and became friends. Standa had an easy-going and open character. I will always remember him with a smile on his face and wearing his characteristic shorts and t-shirt (irrespective of the weather or season). Standa was a supportive and trustworthy colleague, always happy to allow himself to advise others and develop ideas together. This is despite him having a very busy academic life and being prolific in writing and publishing.

It was much educative to talk to and spend time with Standa. His knowledge on energy transitions, post-industrial landscape, and Eastern Europe was comprehensive yet detailed and precise, with a plenty of examples to learn from. Native of Ostrava, an old-industrial city in Czech Silesia, on the border with Polish Silesia, he was a voice of the periphery, not a “capital city guy”. He was keen to explore the geographical varieties in their complexity, as they are, not being blinded by centrality. He had acute interest in peripheral areas, many of which have experienced neglect and abandonment. Many of his publications map such derelict areas, brownfields, and landscapes of decline. But they also actively seek ways to put such areas on trajectories for regeneration and sustainable development. I also learnt much from him about the Czech Republic (Standa insisted it was Prague-centric and historically incorrect to call the country “Czechia”).

Even as Standa moved his job to Aston University and then to the James Hutton Institute, he and his family continued to live in Cardiff. He did not want to disrupt the school studies of his beloved and clever sons, Vojtech and Tadeas. His wife Iлона also had a job in Cardiff, teaching English for foreign students. We met them regularly as families in Cardiff over these few years – which was always memorable and warm events. Standa had a beautiful and intelligent family.

Standa loved his motherland and kept his Czech academic affiliations. And yet he was a citizen of the world, full of geography in his biography. He chose to do his PhD in Slovakia and loved Bratislava, combining his research there with his work at the Institute of Geonics in Brno. He had many research projects and colleagues across Eastern Europe. He always had fond memories of spending time in Arizona in the US in 2016. Wales has become his last home. This is where he died so untimely and tragically. Standa will always be greatly missed.

### **A great personality and visionary in sustainable land use and brownfield redevelopment**

*(A memory from Stephan Bartke)*

Stanislav Martinát, a remarkable figure in the realm of sustainable land use and brownfield redevelopment, has left an indelible mark on our field and the hearts of those who had the privilege of working alongside him. Standa's passion, dedication, and his remarkable ability to bridge geographical and professional divides have not only advanced our understanding of sustainable land management but also enriched the lives of colleagues from diverse backgrounds.

I had the honor of collaborating closely with Standa on several projects and publications, experiences that I will forever cherish. Our journey together was particularly shaped by our work on the FP7 project TIMBRE from 2011 to 2014. Standa was the perfect team player, always open to suggestions and tirelessly working to improve our outcomes, ensuring the thoughtful application of methods both in the geographic methodological and in the Eastern Central European context.

In the realm of sustainable land use, particularly in brownfield redevelopment, Standa was a trailblazer. He possessed a unique ability to identify, map, and trace the potential for success and the barriers to brownfield development. His work in the TIMBRE project stands as a testament to his commitment to user-oriented solutions in this critical field. From 2014 to 2017, Standa and Petr Klusacek played pivotal roles in the H2020 INSPIRATION project, where they were instrumental in developing the INSPIRATION Strategic Research Agenda. This agenda, based on the input of over 500 European stakeholders, including funders, scientists, policymakers, and public administrators, owes much of its success to Standa's dedication and expertise, especially in the context of brownfield reuse.

Standa's contributions extended beyond the professional realm. He was a true ambassador for his homeland, the Czech Republic, and his warmth and hospitality were evident during our visits to Brno and Standa's home town Ostrava. These gatherings not only fostered intellectual exchange but also provided a glimpse into the rich culture and hospitality of the South Moravian and Moravian-Silesian regions.

While we celebrate Standa's professional achievements, we also remember the person behind the researcher—the devoted husband and loving father of two sons. Our thoughts are with his family during this difficult time as they navigate this profound loss. Standa's passing leaves a void in our professional and personal lives, but his legacy will continue to inspire us to push the boundaries of sustainable land use and brownfield redevelopment. Let us remember him not only for his academic contributions but also for the warmth and friendship he shared with all of us.

In Standa's memory, let us continue the work he was so passionate about, striving to make sustainable land management a reality for our shared future. With heartfelt condolences and warm remembrance.

### **A wanderer who brought knowledge and goodness**

*(A memory from Robert Krzysztofik)*

Shortly before Standa left us, he wrote to me – “I have some ailments, but they will end soon. Even if it takes a little longer, I will still meet students online in October.” I replied to him that “everything is OK”. “For students, a lecturer like You will always be the best. Regardless of the form in which he gives lectures. They always aroused admiration and recognition”. In both cases, they resulted from Standa's great knowledge, but also from sympathy and kindness for other people. Everyone who knew Standa, even

briefly or only temporarily, felt it. Standa was full of this human kindness. He gave it to everyone around us. Everyone... Even those who didn't realise it.

Shortly before Standa left, we also arranged to see interesting brownfields in Sosnowiec. In winter, maybe in spring. I have planned a walk for this occasion... I would like to write that since I am in this place now, I will no longer be able to show it to him. However, I know that it is different... It is impossible to be in this place without thinking about Standa, his passion, knowledge and this sincere desire to see this place.

We learned a lot from him, and especially local communities learned a lot from Standa. He passed on knowledge and also goodness to others. I know that Standa will remain with us forever. Among us researchers, he was and will be a great man, a good colleague and an excellent scientist.

P.S. On September 19, 2023, the Senate of the University of Silesia in Katowice honored the memory of Dr. Stanislav Martinat, professor at the University of Silesia, with a minute of silence.

## Creative friend with eternal optimism

### *A memory from Marián Kulla*

I was introduced to Standa at a scientific conference by professor Spišiak, my colleague and Standa's dissertation supervisor. I still remember his words „Majo, this is my very smart PhD student from Moravia“. Our first conversation was not long, but it was long enough for me to find out Standa is a right guy.

After this meeting, our communication began to intensify, leading to scientific collaboration. The very first scientific output was the study presented at the conference in Lithuania. I have to admit that working with Standa was amazing. He was very creative, hardworking, and reliable. We decided to develop our scientific cooperation in the form of a joint project on the development of biogas energy in the Czech Republic and Slovakia. In the summer of 2017, I visited him in Karvina for this purpose. There, together with Petr Dvořák, we prepared a draft of the project, and Standa gave us a perfect excursion around the town and its surroundings affected by coal mining. Subsequently, we met in the spring of 2018 in the South Moravian village of Bořetice already while solving the project. It was once again confirmed to me how creative and skilled Standa was in his field. In addition to work, these meetings gave us the opportunity to share matters from our personal or family life. This is how I got to know Standa even more as a great colleague, friend, and also



Fig. 4: Standa and B. Frantal on a trip to Niagara Falls, April, 2014  
Photo: B. Greer-Wootten

husband and father. The time spent with him was very pleasant. We had good time until late night and we agreed that he would visit us in Košice.

Subsequently, in connection with Standa's new place of work in Cardiff, Wales, we met in person only once at a conference. We replaced personal meetings with intensive e-mail communication or video calls. Together with other colleagues, we managed to produce several valuable scientific publications, for which I am very grateful to Standa. During our entire cooperation, he radiated good mood, optimism and peculiar humour.

The news of Standa's death shocked and hurt me. I knew about his health problems, but until the last moment his messages seemed incredibly optimistic. In them, he repeated words like: "Majo, don't worry it will be fine" or "I feel much better now". Unfortunately, the reality was different. In the person of Standa, I lost an excellent co-worker, colleague, but above all a good friend. Unfortunately, we will not be able to realise our plans to sit down for a beer in the Košice Hlavná Street. Rest in peace my friend.

## Crossing borders of the impossible, building robust bridges

### *(A memory from Miroslava Ondráčková and Bryn Greer-Wootten)*

It is difficult to know where to start. Standa was always there, always able to provide help and assistance, regardless of the task. He had a presence of mind that was instrumental on many many occasions. For the Moravian Geographical Reports, he held the somewhat ceremonial title of "Business Manager", although it is likely that he cared little for either business or management. But as ever he did his job very well and undoubtedly a good part of the rise to prominence of MGR is due to his efforts on our behalf.

Of the myriad examples that could come to mind as remembrances of his inscrutable presence, two stand out. The first is when he and Bohumil Frantal were on their way to the AAG conference in Tampa, and they visited us in Toronto. By chance, some good friends had family with a fruit farm in the Niagara peninsula and we spent a very pleasant day visiting them. To witness Standa's joy and exuberance among all the apple and pear trees is never to be forgotten, even after the wonders of Niagara Falls!

The second instance covered several visits to brownfields, one in particular in Ostrava stirred his soul – "Why should people have to live so close to such a degraded environment?" In fact, the relations between humans and their environments were at the core of his concerns and made him the exemplary geographer that he was.

Finally, as some tribute to his recent sojourn in Wales with Ilona and their two great boys, let us ask Dylan Thomas for some words of condolence – Standa himself could well have said them: "Do not go gentle into that good night, Old age should burn and rave at close of day; Rage, rage against the dying of the light." You will always be with us, Standa.

## That will have to be enough

### *(A memory from Mike Pasqualetti)*

Standa was one of the kindest men I have ever known. If he had just that one trait, it would have been more than enough to sustain a solid friendship. Yet, there was more, much more to him. He was a consummate professional, a respected and well-published scientist, a loving husband to Ilona, and the father to two wonderful sons, Vojta and Tad.

I treasure memories of being in his company several times over the years. In 2012, in Brno, Czech Republic, we visited a magnificent house designed by Ludwig Mies van der Rohe known as Villa



Fig. 5: Standa at the Apache trail, Arizona, April 2013  
Photo: B. Frantál

Tugendhat. It had been added to the UNESCO World Heritage list in 2001 and was the central “character” of “The Glass Room”, a novel set during World War II. Knowing my interest, Standa joined with me on a tour of the Villa when I was in Brno for a conference. Understandably, the tour was in Czech. Standa kindly translated for me without prompting. Later during that same visit, Standa and I joined others on a field excursion to lignite mines near Most city and wind turbines on the border with Germany.

Not long afterward, we were together again at the AAG conference in Los Angeles. After paper sessions finished, I took him and our mutual friend Bohumil Frantál to the Griffith Observatory overlooking the city. It was a notably clear day. Later on that same trip, he and Bohumil visited me in Arizona. I showed them the vast desert urban landscape in and near Phoenix. He remarked that he wasn't in Brno anymore!

Little did I know at the time that a few years later we were to be together again, this time for a more sustained period. He was a visiting Fulbright Scholar in the School of Geographical Sciences and Urban Planning at Arizona State University where I continue on the faculty. It was my turn to serve as host (minus the need to offer translating services). It was a pleasure, especially because this time he brought his entire family.

Years went by, but we always maintained a correspondence as he accepted various academic positions in the UK. Today, Ilona holds several responsible positions including teaching English in Cardiff, Wales. The boys continue benefit from the international experiences Standa and Ilona always supported. Vojta has just started at the University of Bristol and Tad is entering sixth form college. And life goes on.

But it goes on without Standa. Although I will never forget the times I spent with him, I made a common mistake: I always expected there would be many more opportunities. Instead, I will have to be satisfied with the memory of how he graced my life and all the others who knew him. That will have to be enough.

### **‘Remembrance is a form of meeting’**

*(A memory from Justyna Chodkowska-Miszczuk)*

I met Stanislav (Standa) Martinat several years ago. First, our research paths crossed in the context of the publication of my article in the Special Issue *Moravian Geographical Reports* on

energy geographies. Later, we had the opportunity to work together on a project concerning the operation of biogas plants in a local structure (comparative studies in Poland, Czech Republic, and Slovakia). While doing research together in the Czech Republic, I came to know Standa as a smiling, open, and passionate man. He was characterised by an extraordinary confidence in others, impeccable manners (so rare nowadays), and modesty. The local business people and decision-makers we interviewed were exceptionally friendly towards him. He knew how to win people over, regardless of their background, age, social status, or whether they held a prominent public position. He showed me Ostrava and Karvina from slightly different perspectives, not as typical tourist destinations, but choosing personalised, individualised paths, and local contexts connected with history, tradition and local cuisine, like an eminent Geographer.

The following years were full of joint professional activities. Finalising the empirical analyses carried out, we worked on joint articles and further projects, often expanding our team. He always remained optimistic, even when our hard work was not always met with enthusiasm. He was a man curious about people and the world. He saw the synergy in the collaboration and joint action of many people and, therefore, different perspectives. I remember how we met at the AAG conference in New Orleans, where I had a presentation during a session he co-organised. Apart from his amazement that I had arrived in the evening the day before I spoke (the session started at 8 a.m.), I remember how passionately he talked about the places he had visited and those yet to come. He was absorbing the world and inspiring people.

Just a few months ago, we were discussing joint scientific activities, including more on-site query research, this time in Poland. In the spring, he wrote to say that he was very sorry but that he had to cancel his visit to Poland for health reasons. At the same time, he kept assuring me that everything was going well, that he was already feeling better, and that everything would be fine. Back at the beginning of August, we were still working out the details of how we would continue to work together. I wrote Standa my last e-mail on 16 August. As it later turned out, it was after he had already died. This tragic news reached me later. To say that it was a shock and disbelief is like saying nothing at all.

We were not given the chance to meet, as we had planned, to carry out the research in Poland, but I am convinced, following the words of Khalil Gibran: ‘Remembrance is a form of meeting’, that there are countless more encounters ahead of us.

### **The show must go on**

*(A memory from Bohumil Frantál)*

The news of Standa's death came as a shock to most people. For the last few weeks, I have somehow suspected that his health condition and prospects for recovery will not be as optimistic as he presented to his friends and colleagues. However, even I did not expect the end to come so soon. Back in May, we were talking about how it would be great to see the AAG conference in Hawaii next year. Unfortunately, we're not going to go anywhere together anymore.

I haven't spent as much time traveling with anyone (including my wife) as I have with Standa. Together we have been to more than 20 different countries. When some interesting conference came up or there was a need to participate in a project meeting, Standa could be counted on to go. I always looked forward to trips with him. You could talk to him not only about work issues, but about everything – from geography, politics, through history, contemporary culture to music and sports. We were often forced to solve various private matters and problems while travelling that we discussed together. Standa was one of the most relaxed, communicative and non-confrontational people I have met in my

life. Despite the fact that we had different views on many things, it probably never happened that we argued or that he really annoyed me with something (hopefully he would say the same about me).

Standa had a knack for finding common ground, sanding down edges, and brought calm and optimism to problem solving. When we flew to the United States for the AAG conference in April 2010, we took our wives with us to visit Washington D.C. and New York City. At that time, Standa already had two small sons, whom they left at home for their grandmother to take care of them. The eruption of the Eyjafjallajökull volcano in Iceland then paralysed air traffic and changed the plans of many people around the world. When we wanted to rebook our cancelled flight (it was not possible to deal with it via the Internet or by phone at the time, we had to go personally to JFK airport, which was already full of people from cancelled flights), they offered us the first free flight in a month. That was a shock. We had to deal with accommodation, money and other things. Of course, Standa's wife, who was worried about their small boys, suffered the worst. At that time, Standa calmed the situation with his typical "it will be fine... it will be done somehow". In the end, everything turned out better than expected and we enjoyed a few extra days in warm spring New York. Only Standa was a little unhappy that on the flight back in the business class (where he got a seat as a replacement for our cancelled flight) instead of the obligatory "chicken or pasta" they served him shrimps with white wine (although he loved traveling and foreign countries, in terms of food, he was not a big gourmand and was most satisfied with traditional Czech „svíčková“ or German bratwurst).

Standa was the first person I shared an office with when I joined the Institute of Geonics in 2002. He introduced me to the secrets of the Institute's functioning at that time, showed me how to safely surf the internet and other important things. We never dreamed that we would spend next 20 years at this workplace. But it was a time of easy going and chill. We did not deal with the Impact Factors and H-indexes, and at that time not even mortgages. We were carefree "young researchers".

At that time, we spent a lot of time in the Institute's archive at Veslařská Street, where we (with Petr Klusáček and Pavel Klapka) revised and digitalised (i.e. transcribed into an Excel spreadsheet) the complete library collection of Geonics (over 30,000 books!). We loved going there. It was a quiet place and you could find a lot of historical treasures in the form of old atlases and memorabilia from the time of the original Geographical Institute of the Czechoslovak Academy of Sciences. Moreover, associate professor Jan Lacina had a detached workplace there, who was the source of countless stories, a wonderful storyteller and a companion for a bottle of wine or schnapps.

Standa was a geographer of agriculture. Not that he would choose it himself. It was directly assigned to him, as was the custom at that time in our Institute (it needed to be done and no one was doing it). Standa took up the field conscientiously and over the years found his research "niches" in it, in which he came up with original research and results (at first he dealt with the problems of agriculture in the mountainous and disadvantaged areas, later he focused on the spatial aspects of the development of biogas plants). But he is probably most famous in the field of brownfields research, where he is often ranked among the world's most influential authors (see Lin et al., 2019; Zhang et al., 2021).

As part of the project "Geography of small Moravian towns", we traveled quite a lot back then and created stories that are still remembered today. Trips to the towns of Telč or Nové Město na Moravě have become legendary. In Nové Město, Standa also came up with the idea of renewing of publishing the journal "Zprávy Geografického ústavu ČSAV" (Reports of the Geographical



Fig. 6: Standa with his wife Ilona at Coney Island, New York City, April, 2010

Photo: B. Frantál

Institute) in a form of DIY zine, and he assumed the position of "chairman" (Martinát, 2005). The so-called 'Seria Nuova' of Reports has become a cult zine for many thanks to its snappy essays on the border between serious science, geographical satire and anti-alcohol humor. It is sad fact that four of the "young geographers" who published in this zine are no longer with us (apart from Standa, also Dan Seidenglanz, Jakub Novák and Jana Temelová).

Standa had been heading „to the West“ since his studies and saw the potential in collaboration with Anglo-Saxon geography. He was constantly looking for funding opportunities for various projects, foreign internships, he registered at all kinds of research platforms and social networks, and actively approached potential partners. As part of his ECOP (Education for Competitiveness Operational Programme) project "Improvement of professional skills and abilities of geographers of the Institute of Geonics", in 2010 he managed to invite several personalities of world geography to lecture in Brno, including Dan van der Horst, Gordon Walker, Damian Maye, Michael C. Hall, Maarten Wolsink, Mike Pasqualetti and Keith Halfacree. These lectures became the basis of the book "New Rural Spaces..." (Frantál & Martinát, 2013) and were the beginning of a fruitful collaboration with many of those mentioned, which continues to the present day.

Standa adapted very well to the Czech science evaluation system, when only journal articles began to be counted and "rewarded". Expressed in the ice-hockey terminology, he was a very productive player – in terms of both goals and assists. Although he was extremely publicationally efficient in the context of Czech geography (also thanks to his cooperation with many colleagues from abroad), he did not use the so-called „kafemlejnek“ (coffee grinder) system in a targeted manner and did not reduce himself to shooting down as many easy birds as possible with little effort. On the contrary, he always tried to publish in the most prestigious journals, which often cost him a lot of time and effort in revising and adapting texts. I believe that he would soon succeed even in the Nature, which he attempted with some papers.

Standa was extremely hard-working and he launched offensives on many fronts simultaneously. This did not only apply to research projects and publishing, but also to other activities. It was certainly also a consequence of the system of (under)funding of science and research in the Czech Republic, which forces scientists to obtain projects from various sources and forces many to have work commitments in several places at the same time. Standa was one of the few who never refused an offer to join a new project (mostly he just didn't join, but led the project himself as a principal investigator), he came up with ideas for papers, innovated the subjects he taught, supervised students, did



not refuse to review articles and evaluate project proposals for grant agencies here and abroad. Nor can I forget his work and support for MGR journal. At the same time, it never happened that he slacked off on the task he accepted. This hard work, often associated with time pressure and stress, may unfortunately have eventually contributed to his illness (who knows?).

In the person of Standa, we are losing not only an excellent scientist and teacher, but especially a loving and devoted husband and father, friend and comrade with indomitable optimism, modesty and a sense of humor.

It won't be easy to continue without you, Standa. But as you would say: "It will be done somehow... it will work". The show must go on.

## References:

- Frantál, B. & Martinát, S. (Eds.) (2013). *New Rural Spaces: Towards Renewable Energies, Multifunctional Farming, and Sustainable Tourism*. Institute of Geonics.
- Lin, H., Zhu, Y., Ahmad, N., & Han, Q. (2019). A scientometric analysis and visualization of global research on brownfields. *Environmental Science and Pollution Research*, 26, 17666–17684. <https://doi.org/10.1007/s11356-019-05149-3>
- Martinát, S. (2005). Welcome. *Zprávy Geografického ústavu ČSAV*, 30(1) (Seria Nuova), 5.
- Zhang, X., Song, Y., Wang, S., & Qian, S. (2021). Exploring research trends and building a multidisciplinary framework related to brownfield: a visual analysis using citespace. *Complexity*, 2021, 8882415, 1–14. <https://doi.org/10.1155/2021/8882415>

## Please cite this article as:

Frantál, B., Bartke, S., Chodkowska-Miszczuk, J., Golubchikov, O., Greer-Wootten, B., Klapka, P., Klusáček, P., Krzysztofík, R., Kulla, M., Ondráčková, M., Pasqualetti, M. J., & Van der Horst, D. (2023). In memory of Stanislav Martinát (1976–2023). *Moravian Geographical Reports*, 31(3), 174–181. <https://doi.org/10.2478/mgr-2023-0016>

# MORAVIAN GEOGRAPHICAL REPORTS

## AIMS AND SCOPE OF THE JOURNAL

The **Moravian Geographical Reports** [MGR] is a peer-reviewed international journal that has been published in English continuously since 1993 by The Czech Academy of Sciences, Institute of Geonics, through its Department of Environmental Geography. The journal followed the traditions of the Reports of the Institute of Geography of the Czechoslovak Academy of Sciences, a journal which was published from 1963 to 1992. The title of the journal celebrates its origins in the historic lands of Moravia in the eastern half of the Czech Republic. Since 2023, the MGR is co-published by Palacký University Olomouc, Faculty of Science through its Department of Geography.

The MGR has been indexed in the SCOPUS database since 1993. In 2012, the MGR was selected for coverage in the **WEB OF SCIENCE** (Thomson Reuters/Clarivate Analytics) products and customs information services. Beginning with Volume 19 (2011), this publication is indexed and abstracted in the Social Science Citation Index®, Current Contents Connect®, and Journal Citation Reports/Social Science Edition®.

The Moravian Geographical Reports is **a non-commercial open-access journal**, publishing electronic articles in the “platinum” open-access mode (i.e. no fees for readers and no article processing charges or publication fees for authors). MGR is published four times per year – at the end of every third month of the year. Beginning with Volume 21 (2013), the electronic contents are published also on the De Gruyter/Sciendo publishing company website. Starting with Volume 28 (2020), the journal is published only in electronic form.

As a general purpose **geographical journal**, MGR receives and evaluates articles contributed by both human and physical geographers, as well as by other researchers who specialise in related disciplines, including the social sciences (environmental studies, regional and urban planning, etc.) and geosciences. The MGR aims to publish rigorous and impactful research on topics responding to the role of regions and localities in a globalised society, given the geographic scale at which they are evaluated.

We recognise the challenges that our society needs to cope with during the current environmental crisis and emphasise the unique role of Geography in understanding the processes of sustainability transition and climate change adaptation, by paying attention to particular geographic settings, spatial configurations, and the dynamics of networks within which the processes are contextualised. Several inter-related questions are stressed: problems of regional economies and society; society in an urban or rural context; spatial organisation of geographical systems; the quality of life and spatial behaviours; regional perspectives on the impacts of human activities on landscapes and environments; energy sustainability and environmental restoration; and geographic processes in landscape evolution, including the evaluation of hazards. Theoretical questions in geography are also addressed, especially the relations between human and physical geography in their regional dimensions.

The journal has a distinct regional orientation, broadly for countries in Europe, with a special emphasis on issues that are different for Central and/or East-Central Europe. **Submissions dealing with regions outside of Europe are not accepted**, except for invited contributions to thematic Special Issues. For a detailed description of the types of papers accepted for publication, our review process and indications for the preparation of submissions, see the **Guide for Authors**.

**ACCESS TO THE JOURNAL:** Information on the Journal’s aims and scope, Instructions for authors, Calls for Special Issues, and full contents are available free online at:

<http://www.geonika.cz/mgr.html>

<https://content.sciendo.com/view/journals/mgr/mgr-overview.xml>



