

## QUESTING FOR CONTEXTS IN THE RESEARCH OF REGIONAL INEQUALITIES IN SLOVAKIA: APPLICATION OF THE CONCEPT OF CRITICAL REALISM

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**Abstract:** The article aims to identify factors conditioning regional development. In the research, we decided to apply the approach of critical realism, which consistently distinguishes the role of contextual conditions (factors), causal mechanisms and general processes. We emphasize the distinction between geographic, demographic, cultural and economic conditions and their different explanatory power. Through factor analysis, we reveal what combinations of contextual conditions are involved in the formation of uneven development. Using cluster analysis, we show how regional inequalities in Slovakia developed between 2001 and 2021. The results show the dominance of the regional hierarchy factor, which, together with FDI, creates the prerequisites for the pro-growth effect, especially in the Bratislava region. On the contrary, in several regions, we observe a stabilization effect through the factor of structural employment, which has a complementary character: regions with a dominance of employment in manufacturing lack employment in the providential foundational economy and vice versa.

**Keywords:** critical realism approach, contextual conditions, factor analysis, cluster analysis, regional inequalities, Slovakia

### 1 INTRODUCTION

Today, geographers are in a different situation, when studying the regional structure of the state, including the development of regional disparities and the possibilities of reducing them compared 30 years ago. Former they focused on two processes upon in different contextual conditions and mechanisms: the economic restructuration of regions including social consequences and the political/institutional reconstruction including a new territorial-administrative division and restoration of territorial self-government. Nowadays, it is necessary to respect economic integration and globalisation, cultural diversity, and the importance of informal (social) net-

works to a much greater extent. Churski et al. (2021) emphasize that when analysing the main social, especially economic changes after 1989 in Central and East European countries, it is necessary to respect the fact that regional development at the national level takes place under the influence of two important processes: transformation and integration, as well as under the influence of two global megatrends: globalization and post-modernization.

We recognize that current political-economic processes and mechanisms are carried out under the influence of the framework of global production networks and value chains. Gong et al. (2022) state that regions involved in the global economy face four external factors: macro-level geopolitical tensions, uncertainties and conflicts, consequential trade conflicts, barriers and frictions (1), climate change and environmental protection with transition to a green (post-carbon) economy (2), digital technologies towards to robotization and the Internet of things (3) and the effects of the COVID-19 crisis (4). Van Meeteren and Kleibert (2022) claim that these external factors introduce uncertainties and vulnerabilities into the functioning/management of national and regional economies, which are struggling for the best position in the global economy. The key task will be to secure against risks in two ways: able to shield themselves from risk and bear risks, whereby strategies of de/bordering, dis/connecting and dis/associating will play important roles in determining future riskscape. The influence of some events and processes (mainly geopolitical, COVID-19) was very significant in the case of Slovakia, but the effects and consequences of other ones will become apparent over time (green post-carbon economy, digital technologies).

It is in this place that the space for the action of the state, local self-government, the domestic business sector, the institution of R&D and other informal institutional relations opens up. The idea that local actors were allowed to mobilize the activity and potential of regional assets and take responsibility for urban development and planning first appeared in Great Britain in the 1980s, after neoliberal policies began to be applied in the urban environment (Cooke, 1989). Regional development actors in post-socialist countries faced similar challenges after 1989. Ambiguous results of privatization processes showed that the behaviour of “new” political elites and owners of privatized enterprises remained deeply rooted from the times of socialism (Williams and Baláž, 1999). The events after 2020 (COVID-19 crisis, Russia-Ukraine war) were another test of the public and private sectors to bear responsibility for managing crisis events and negotiating strategic partnerships within the GPN (Yeung, 2021).

We mean that the above-described conflict between global capital flows and regional fixed assets would help to explain the concept of critical realism. The logic consists of a consistent distinction between factors, processes and mechanisms that are activated by human agency. The basic idea is to describe the causal mechanism, which begins with the identification of the factors (structure and context) that activate the causal mechanisms. The resulting process or resulting event is conditioned by a combination of conditioning factors and potential conditions of development on the one hand and causal mechanisms on the other (Sayer, 2000). In the paper, we

will focus primarily on contextual conditions that must be distinguished according to the degree of complexity, into internal (evolutionary) and external (ecological) relationships and conditioning factors (phenomena), which contain the potential to differentiate regional development (HAMPL, 1998). The aim is to uncover causal relationships, and how contingent relations (i.e., contextually specific processes and factors) lead to specific regional outcomes. We emphasize the distinction of contextual conditions according to different aspects. The key one is the distinction between geographic, demographic, cultural and economic conditions and their different explanatory power. Through factor analysis, we reveal what combinations of contextual conditions are involved in the formation of uneven development. Using cluster analysis, we show how regional inequalities in Slovakia developed between 2001 and 2021.

Our recent research (Rusnák et al., 2023) dealing with the relationship between national growth and interregional inequalities showed that regional development has entered the second stage: along with the growth of the national economy, regional differences are decreasing. However, this seemingly positive trend is taking place at the expense of a decline in the relative performance of the Bratislava city region and Slovakia's lagging behind the EU average in terms of GDP in PPP. To understand why there are different and sometimes contradictory development tendencies, it is important to know the factors, processes and mechanisms conditioning regional development and differentiation of social organization. We consider this contribution to be a kind of continuation of the research on regional development and regional inequalities in Slovakia.

The article is divided into several chapters. Chapter 2 includes a discussion on some basic issues of the origin, development and evaluation of regional disparities in the context of the V4 countries and Slovakia itself. It is based on the approach of critical realism, which distinguishes general processes, causal mechanisms and contextual conditions of development. Chapter 3 clarifies the research methodology used and the data used. Chapter 4 presents the research results divided into several parts. Chapter 5 is dedicated to the discussion of the obtained results with the knowledge of the current scientific literature. The last chapter 6 contains a summary of the key conclusions of the presented study.

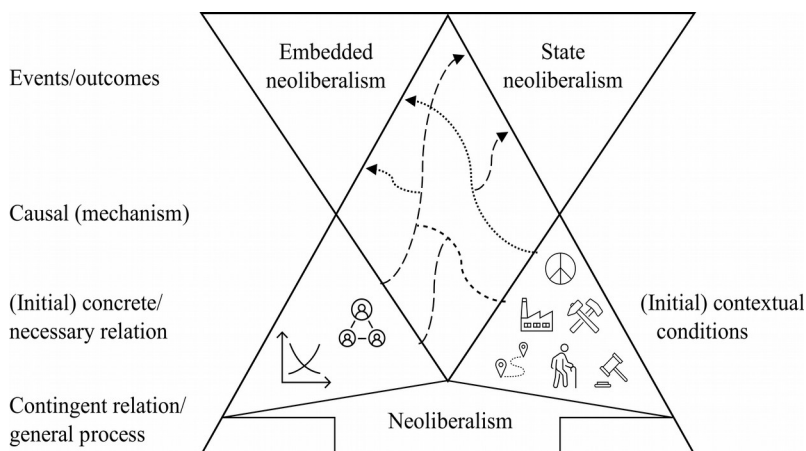
## **2 EXPLANATIONS OF REGIONAL INEQUALITIES FROM THE PERSPECTIVE OF CRITICAL REALISM**

In line with many authors (Sayer, 2000; Yeung, 2019a; Mukumbang, 2023; Sotarauta and Grillitsch, 2023), critical realism is a mid-range theory providing ontological roots (recognising three domains of reality) for an empirical study of social reality. According to Yeung (2023), mid-range theories in economic geography require both causal explanations and specific contexts of operationalization to work to point out the combination of factors, processes and mechanisms explaining regional development. Their range lies in the fact that they go beyond individual cases and

subject experiences on the one hand, but do not aspire to big theories, metanarratives and universal generalizations on the other hand.

We will show the logic of the causal explanation at the company level. Entities (firms) having structures (knowledge, technology) and necessarily possessing causal powers (marketing) or liabilities (regulation) will, under specific condition 1 (demand will exceed supply) result in an event 1 (sale and profit), or under specific condition 2 (supply will exceed demand) will result in an event 2 (no sale) (Easton, 2010). It is important to recognize the nature of causal relationships. These can be (internally) necessary or (externally) conditioned. In the first case, the company exists (makes a profit) thanks to the demand for their goods – a necessary relationship. Conversely, companies can operate with or without investment subsidies – contingent relationship. This structure of relations (the firm), formed by internal, necessary and external, conditional relations, activates mechanisms that can bring different results according to the geographical, cultural and political-economic context in which they work. This means that companies implement their activities in a wider market environment, therefore their strategies cannot be studied only at the level of an individual company, but concerning other companies, state regulations, or consumers (Delgado et al., 2011).

If we move from the micro-level of companies to the meso-level of regions, regional development research from the point of view of critical realism does not represent a linear and deterministic model between causes (expressed by structures, factors and mechanisms) and effects (expressed in the form of processes of path dependence, uneven development), but one based on the combined interaction of causes and effects. This approach was applied to regional development in the works of Hampl et al. (2008) and Blažek and Hampl (2009). Inspired by the pyramid model of regional competitiveness proposed by Lengyel (2004) we supplement, respectively we modify the original graphic model with additional connections (Figure 1).



**Figure 1** Process, contextual factors, and mechanism in regional development.  
Source: Lengyel (2004), Yeung (2019b) elaborated by authors

## 2.1 The process of uneven development and its mechanism

According to Yeung (2019b) process contains causal mechanisms that lead in different contexts to different intended and unintended outcomes. The process can never be closed, it is a sequence of repetitive outcomes that create or shape various paths of development. As an example, he cites the process of neoliberalization, acting from the top down, which can contain various mechanisms leading to uneven development. But not all (uneven) geographical results are caused by the process of neoliberalization. There are examples where neoliberal politico-economic practice has enabled selected large cities and regions with favourable geographic location and high-quality and available human capital to grow. Other cities and regions with a bad geographical location, an inappropriate structure of human capital, or improper government interventions paid extra for uncompromising neoliberal programs, e.g., selective migration (brain drain). To avoid universalist claims, it is important to specify the general and particular relationships that transform the general process of neoliberalization into specific mechanisms with a direct impact on the functioning of companies or regions to their survival strategies (e.g. adaptability, resilience, and diversification are processes, which by activating specific mechanisms in a specific context can face an increase in unemployment – resulting event). In other words, the abstract idea of “bad” neoliberalism needs to be embedded in a concrete set of institutional practices that interact with the existing socio-spatial conditions (context). Only then is it able to generate different results (bad, or good neoliberalism). The difference in the understanding of neoliberalism as a process and mechanism Yeung (2019b) points to the example of China, which has adopted elements of neoliberalism (free trade, entrepreneurship), but some dimensions (commodification of land, property and housing market, see Zhou et al., 2019) they acquired a specific meaning because they remained controlled and managed by state-owned enterprises. Just as there is neoliberalism or capitalism with Chinese characteristics (Harvey, 2005; Peck and Zhang, 2013), there are different forms of neoliberalism and capitalism in post-socialist countries (Bohle and Greskovitch, 2007; Nolke and Vliegenthart, 2009; Birch and Mykhnenko, 2009).

Therefore, causal mechanism requires a necessary and contingent relation that connects a specific cause with its eventual effect in broadly similar contexts. Mechanism requires two key components (Yeung, 2023):

- material objects: entities or parts that are stable bearers of properties or causal powers (firms, institutions, knowledge, infrastructure),
- actualized activities: interactions or operations that are more than just emergent potential or capacities and produce real changes in society and space (domain of actual).

This means, that socially produced objects or events require human agency to become effective or to be improved. In the domain of actual (includes events, whether observed or non-observed, generated by the mechanisms) is important, that firms, institutions, knowledge, or infrastructure enable certain actions but do not determine what people buy, behave in an institutional context, how combine the knowledge, or which infrastructure used (Sotarauta and Grillitsch, 2023).

## 2.2 Context as factor conditions of uneven development

Causal structures unfold under contextual conditions or phenomena – e.g., context. The research conducted under critical realism emphasizes that the same mechanism can produce different outcomes in different contexts (Gong and Hassink, 2020). The regional context changes from place to place and is sensitive to natural conditions, social and cultural issues, the relationship between the state and companies, and reacts to (geo)political decisions. As part of regional development research, various factors and structures that are activated by intended or unintended actions and reactions of individual actors must be taken into account.

Context has important explanatory power as a source of competitive advantages (Porter, 1990), agglomeration economies (Krugman, 1991), formation of clusters of related industries (Delgado et al., 2016) and relocation of foreign capital and labour (Harvey, 1982; Massey, 1984), although many authors do not implicitly emphasize this fact. Contextual or factor conditions are considered the source of regional inequalities because the inhabitants and their culture are tied to specific places with suitable conditions for life (Myrdal, 1957).

According to Hampl's theory of complexity, it is precisely the different level of structural (internal) complexity and evolutionary complexity of phenomena that characterizes the size of inequalities (Hampl, 1998). The internal complexity of phenomena says that physical-geographical phenomena are characterized by relative homogeneity in their distribution. A higher degree of variability is shown by the spatial distribution of the population according to demographic characteristics with significant internal conditionality (e.g. according to age), because it is tied to the natural environment, but according to the attribute of economic success with a significant influence of the external environment (e.g. the educational structure is tied to the location of universities) that rather, it will be relative heterogeneity (Ďurček and Bleha, 2013). We can expect the highest degree of heterogeneity when evaluating socio-economic phenomena such as the sectoral structure of companies according to technology-intensive industries, or knowledge-intensive business services. All the mentioned dimensions intertwine and, by combining them in specific institutional conditions, trigger dynamic processes and mechanisms such as mobility, migration, de/concentration, which are manifested at different scale levels (the effect of metropolitan regions of post-socialist countries is known, which causes that income inequalities across countries fall, but between regions within countries raise, Ezcurra et al., 2007). Evolutionary complexity says that qualitatively new phenomena (technologies, innovations) are carriers of progress, but also geographical differentiation, in the initial phase of economic development. In the later phase, when technology or innovation, goods or services become ubiquitous and expand into space, there is a decrease in variability (inequalities). This idea is known as the Kuznets-Williamson inverted U hypothesis (see Williamson, 1965).

Based on several works (Hampl et al., 2008; Slach et al., 2013; Netrdová and Nosek, 2018; Pociūtė-Sereikienė, 2019; Churski et al., 2021), we consider four dimensions of conditioning factors (phenomena): geographic, demographic (cultural), economic and institutional. There is an existence of primary differentiation of the

phenomena related to physical dimensions (geographical location and division of continents, uneven distribution of natural resources). These differentiations, also called first nature, are the ground for the rise of a whole range of contingent conditions within the framework of secondary differentiation – second nature (Cronon, 1991). The invisible hand includes financial and trade flows, the (spatial) division of labour, agglomeration externalities and spatial concentration means that people (workforce), companies, institutions, knowledge, innovations, and new technologies are “emerged” and relocated according to several principles (spatial cost, optimization of profit, marginal benefit, motivation, and others) in a relatively small number of large cities, regions, and states with large home market effect (Krugman, 1991).

A similar way of defining development conditions was presented by Lukniš (1985), who divided the territory of Slovakia into two core areas (centralization regions), in which the primary potential of the Danube Plain in the west and the East Slovak Plain in the east of the country became an ideal prerequisite for the development of secondary potential in the form of the two metropolitan cities of Bratislava and Košice. At the same time, he defined the northern and southern corridor region, which connected both centralization regions, so it had more of a transport function. The geographical location factor known as the east-west gradient has been confirmed in several empirical studies (Halás et al., 2017; Matlovič et al., 2018; Ženka et al., 2021). Another important geographical factor is the settlement hierarchy (size structure of territorial units), which is closely linked to the regional hierarchy of the country. This factor became an important role in differentiating regional development during the post-socialist transformation (Hampl, 1996), where the selective dynamics of knowledge-intensive business services sought metropolitan regions and regions with metropolitan functions (Ženka et al., 2017a).

Conditions of primary differentiation are prerequisites for the occurrence of demographic and cultural conditions. Demographic conditions appear in several studies with different characteristics (Koišová et al., 2021; Bodnár et al., 2022; Baláž et al., 2023). In econometric research, it is most often expressed as human capital (e.g., highly trained, educated and skilled workforce), because it represents a significant part of the variability in explaining uneven economic growth. However, in the context of the second demographic transition, the importance of other demographic characteristics is growing. The ageing process of the population is particularly worrying. This trend is alarming, especially in Slovakia, where large cohorts of so-called Husák’s children from the 70s of the 20th century, progress through the ageing process referred to as ageing from the middle within the 15-64 age group (Káčerová et al., 2022). There is a paradox in the labour market, which says that despite a relatively low and stable unemployment rate, we are registering a labour shortage (Morvay and Hudcovský, 2022).

Differences in geographical location need to be understood more broadly, not only from a “spatial” point of view. These are also sociocultural differences, shaped by long-term development (see Zarycki, 2007; Herodowicz et al., 2021). According to the cited authors, the disadvantageous position of the regions was reflected not only in the historically created differences in socio-economic development but also

in the social and cultural attitudes of the inhabitants of the regions. The inhabitants of the eastern regions of Slovakia and Poland are historically stable and conservative, have respect for traditional values, tend anti-intellectualism and an aversion to elites, and rely more on a strong welfare state and leadership associated with autocratic policies. Local traditions and national identities are then often legitimised through extremist, populist and antisystem parties that mobilise primarily in less developed regions with high unemployment and low wages (Plešivčák and Buček, 2017; Rehák et al., 2021). In this context, the results of parliamentary elections prove to be a suitable indicator representing cultural and ethical values, because the political scene reflects the preferences of voters from more liberal to conservative and even to extremist attitudes and opinions (see Štefančík and Stradiotová, 2022; Buzalka, 2023).

Another development dimension is characterized in the form of economic conditions, which we consider to be a superstructure of the first two. These are precisely the economic conditions that can be realized within suitable geographical conditions with a favourable demographic structure. In general, (socio)-economic phenomena (such as unemployment, and wages) are perceived more sensitively by society because they are considered as a kind of indicator related to the standard of living. They can become a source of growth, but on the contrary, they can be the cause of the decline of regions. For example, a certain structure of the labour market and the economy can be beneficial in times of economic growth, but at the same time, it can represent the risk of increasing unemployment in times of crisis. The concept of the so-called foundational economy tries to find out to what extent the sectors of the economy can contribute to the stabilization and resilience of the labour market against international competitiveness (Martynovich et al., 2023). It assumes that the foundational economy should behave less cyclically than commercial activities because they are necessary for life (food industry, energy, retail, transport), and therefore they belong to the so-called sheltered economies (Fratesi and Rodríguez-Pose, 2016). Perhaps the most significant economic factor transcending regional and national borders in the context of post-socialist countries is foreign direct investment (FDI). Their intensity on regional economies depends on geographical factors (such as the distance from Bratislava, or labour supply, see Dudáš and Grančay, 2019). The effectiveness of FDI is temporally because foreign investors are looking for regions with lower production costs, where they can make a higher profit (Pavlínek, 2020). Even in this case, it is appropriate to consider them together with institutional factors (such as tax burden, political stability, and investment incentives). At the same time, it is necessary to distinguish what activities, or stage of the value chain is subject to foreign investment in the host economy.

Institutional factors are difficult to quantify. Other non-spatial dimensions of proximity (Boschma, 2005) in the form of informal relationships and networks (public-private partnership, trust, and sharing of common values and interests are important (Slach et al., 2013)), where untraded interdependencies are crucial for regional development (Storper, 1997). The key to understanding the importance of institutional factors is the fact that the exchange of information and knowledge in a face-



to-face context takes place in several dimensions at the same time – verbal, physical, contextual, and symbolic. Such multidimensional interaction is considered the basis for the creation and dissemination of tacit knowledge (Storper and Venables, 2004). Institutional factors determine the power position and the interest orientation of the social actors on the one hand, and thus also the control over the primary factors (delineation of competence and management methods of municipalities, zoning of natural areas, expropriation as a strategic interest, Blažek and Hampl, 2009). The growing plurality of interests in the use of space (land, old industrial areas, public spaces in cities) increases the tension between fixed places and the flow of capital, which manifests itself in uneven development (Hudson, 2005).

Our idea is to compare how the effects of the primary factors (geographic and demographic/cultural) change when we add economic conditions to the factor analysis. We claim that the effects of economic factors are dependent on geographical and demographic factors or are to some extent explained by them. Furthermore, we assume that the first-order component factors (with the highest explanatory power) will have a pro-growth effect, while the lower-order component factors will have a stabilizing effect (social protection).

### **3 DATA AND METHOD**

The principal components method was used in the factor analysis. Specifically, we used a rotated method of solving using the Varimax procedure (with Keiser normalization), when the resulting factors are perpendicular to each other, that is, they are not related to each other. Eigenvalue greater than 1 was chosen as the evaluation criterion for factor extraction. After verifying the suitability of the resulting factors and naming them (using a table of correlation coefficients between individual variables and resulting factors), we entered the resulting factor scores into a data matrix and used them as inputs for cluster analysis.

For cluster analysis, factor score values for our statistical units (i.e., approximated functional urban regions, AFUR) were used as input. Specifically, we used the K-means method for clustering, which works on the principle of initiation points (Initial Seed) and where the analyst himself enters the number of clusters into which he/she wants to combine the statistical units. Due to the visualization of clustering results in the map and the relatively low number of statistical units (51 AFUR), we decided on four clusters. Subsequently, we expressed the average values of the components for individual clusters, which we interpreted verbally.

Our analysis is based on the processing of four groups of variables, which represented region-specific development conditions. In Table 1 we summarized a broad list of phenomena. First, we evaluate the variables that represent the assumptions of the first nature of individual regions for development. Specifically, these are variables of a geographical nature (time distance from Bratislava, commuting index, urbanization rate), which represent horizontal and vertical geographical position. The second set of phenomena represents a demographic situation (population size,

**Table 1** Descriptive statistics of variables

Indicator	Maximum		Minimum		Median		Average		Variation coefficient		Source
	2001	2021	2001	2021	2001	2021	2001	2021	2001	2021	
Distance from Bratislava (in min.)	445,2	318,0	7,7	7,7	136,9	132,0	176,5	151,1	69,2	57,3	internal database, Stanek et al. (2021)
Commuting index	16,1	9,5	0,2	0,1	0,5	0,6	0,6	0,6	908,2	533,1	Population and Housing Census (2001a; 2023a)
Urbanisation rate	83,9	78,4	14,5	12,0	51,1	46,9	56,3	52,9	26,0	27,2	SOSR (2023)
Population size	599 042	723 714	35 154	34 655	77 434	79 181	105 470	106 563	85,1	98,8	SOSR (2023)
Average age	38,4	44,0	30,1	34,7	36,2	42,0	36,2	41,4	4,6	4,6	SOSR (2023)
Ageing index	86,1	152,9	26,2	45,7	61,7	117,9	60,8	108,3	9,8	9,2	SOSR (2023)
Share of Roma communities	31,4	33,9	0,0	0,0	3,1	4,1	6,0	7,7	115,4	107,6	The Atlas of Roma communities (2004; 2019)
Share of university educated	20,3	36,3	4,5	10,8	7,1	16,6	9,8	20,8	50,1	37,8	Population and Housing Census (2001; 2023)
Election result SDKU in 2002 or PS in 2023	32,0	31,0	4,0	6,7	10,3	13,6	15,1	17,9	52,2	38,5	Elections and Referenda (2023)
FDI per 1000 inhabitants	1 967	5 128	1	0	72	239	3 205	9 926	91,9	91,5	NBS (2023)
Unemployment rate	35,5	19,9	5,9	3,1	19,6	5,8	19,3	7,3	39,9	51,2	SOSR (2023)
Average nominal monthly wage	519	1 665	291	983	357	1 239	403	1 402	15,8	14,3	SOSR (2023)
Employment density	1 062	1 441	234	222	469	483	450	447	53,8	81,1	SOSR (2023)
Share of PFE on employment	16,7	14,4	9,5	7,8	13,0	9,8	13,8	10,9	12,6	13,6	Population and Housing Census (2001b; 2023b)
Share of manufacturing on employment	25,6	22,8	7,0	5,2	14,1	10,3	13,1	10,7	28,6	34,7	Population and Housing Census (2001b; 2023b)

Source: Authors' calculations

ageing index, average age) and cultural specifics (share of Roma, share of university educated, election result of The Slovak Democratic and Christian Union (SDKÚ) in 2002 and Progressive Slovakia (PS) in 2023). All these variables were separately evaluated for the year 2001 and 2021. Subsequently, we added variables to these conditions, which represent the result of efforts for economic growth, or efforts to reduce regional differences. Specifically added economic variables were as follows: foreign direct investment (FDI) per 1000 inhabitants, average nominal monthly wage, employment density, share of providential foundational economy (PFE) and share of manufacturing from on total employment, and unemployment rate). In our case, we apply the concept of PFE includes only services of basic needs that are taken for granted (Bentham et al., 2013), e.g., public services such as administration, defence, education, health and social care, that are used by all people regardless of income and social status, financed by taxes and (inevitable) household expenses (Hansen, 2022). For that reason, the localization of PFE follows the distribution of the population and the settlement structure. Any deviation from the average may mean that the regions are protected from sudden economic shocks but are less productive in times of economic growth. We did not consider institutional factors in the research. Like the previous set of variables, the factor and cluster analysis were created separately for 2001 and 2021. Factor and cluster analysis were performed in IBM SPSS Statistics statistical software. We developed the map views using the ArcGis program.

## 4 RESULTS

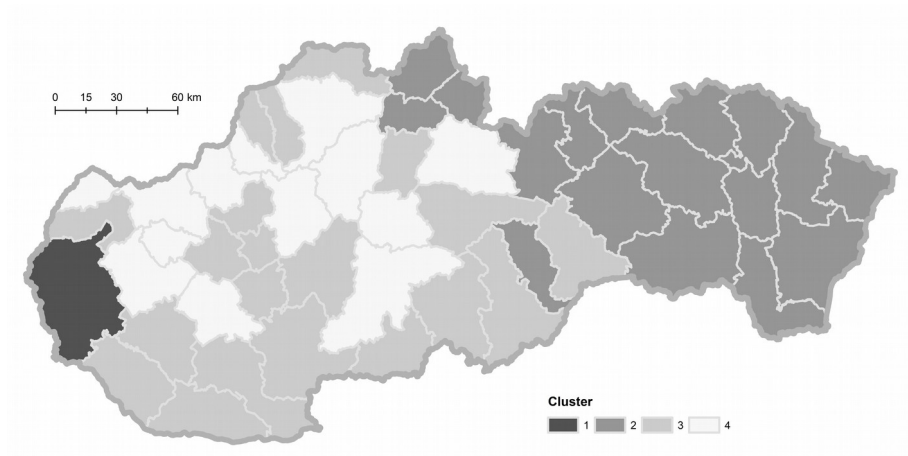
The results of the factor analysis for geographic, demographic, and cultural conditions in 2001 are as follows. In Table 2, two factors were created, which together explain 70% of the variability of the input variables (conditions). Each of these two factors independently explains 35% of the variability. We called the first factor the regional hierarchy (labelled by the most significant effect of the variables) and it is made up of variables that emphasize higher-ranking AFURs in the regional structure of the Slovak Republic. Specifically, it is the commuting index and population size. These variables are supplemented by the share of university-educated people and voters who voted for the SDKÚ in the 2002 parliamentary elections. The second factor could be called the second demographic transition (SDT). In regions where this factor reaches higher values, the average age and the ageing index are higher. These regions are rather closer to Bratislava and have a lower proportion of Roma, and a higher value of urbanization is also achieved there, even though this variable has a partial tendency to be related to the first factor as well.

Then, we used the respective two factors to create four clusters from our unit statistics – AFURs. The first cluster (not really a cluster, because it is formed by only one region) is Bratislava AFUR (cluster 1 in Figure 2). As shown in Table 3 this region achieves by far the highest values of the regional hierarchy factor (large population, high commuting, high proportion of university educated) as well as the

**Table 2** Results of factor analysis of geographic, demographic, and cultural conditions in 2001

Variable	Factor	
	Regional hierarchy	Second demographic transition
Commuting index	0.90	0.07
Election result of SDKÚ in 2002	0.85	-0.02
Population size	0.84	0.04
Share of university educated	0.80	0.34
Average age	0.10	0.91
Ageing index	-0.04	0.91
Distance from Bratislava	-0.14	-0.78
Share of Roma	-0.09	-0.70
Urbanisation rate	0.47	0.50

Source: Authors' calculations



**Figure 2** Regional clusters according to the regional hierarchy and second demographic transition factors in 2001. Source: Authors' calculations

SDT factor (older population, high degree of urbanization, small proportion of Roma). Another cluster (cluster 4) represents regions where a relatively high hierarchical level is still achieved (in several regions there are regional centres – Trnava, Nitra, Trenčín, Žilina, Banská Bystrica, which are natural centres of commuting and have a higher number of inhabitants at the same time). These regions with metropolitan functions are not so far from the capital, there is a relatively low proportion of Roma and there was an older population. The cluster of regions with young popula-

tions (cluster 2) represents practically all of eastern Slovakia along with the Orava region. These are areas that were not connected to Bratislava enough in 2001, thanks to the sparser highway network. Spatially excluded Roma communities are concentrated in them. The values of the regional hierarchy factor are average (even though this cluster also includes the second-highest-ranked region – Košice). The last cluster of peripheral regions (cluster 3) represents AFURs, which are the lowest in terms of the regional hierarchy factor. From the point of view of the population, these are rather small regions, to which the commuting flows were rather less volume and where the share of university-educated people was relatively small. Hungarian and Slovak national narratives, which voted significantly less for the SDKU party in the 2002 elections, could also play a role in connecting these regions into this cluster (Plešivčák, 2011).

**Table 3** Values of the regional hierarchy and second demographic transition factors according to regional clusters in 2001

Factor	Cluster			
	1 (Bratislava region)	2 (regions with young population)	3 (peripheral regions)	4 (regions with metropolitan functions)
Regional hierarchy	++ (5,5)	o (0,04)	– (-0,57)	+ (0,4)
Second demographic transition	+ (0,45)	-- (-1,20)	+ (0,48)	+ (0,8)

Source: Authors' calculations

Notes:

- o average value (factor value in the range -0.25 to +0.25)
- below average value (factor value in the range -1.0 to -0.25)
- strong below average value (factor value in the range -∞ to -1)
- + above average value (factor value between 0.25 and 1)
- ++ strong above-average value (factor value between 1 and ∞)

Subsequently, we added socio-economic conditions to the origin factor analysis formed by geographical-demographic-cultural conditions. In this case, three component factors were created (see Table 4), which together explained 75% of the variability related to the indicators. We called the first of them the human capital factor. This factor explains 37% of the variability and is made up of subfactors such as the share of university-educated people, an average nominal monthly wage, election result of SDKÚ in 2002, commuting index, employment density, FDI per 1000 inhabitants, population size and urbanisation rate. It should be emphasized that unemployment has become a part of this factor, which shows a negative relationship to its values. This means that the higher the value of economic variables, the lower the unemployment rate. The second factor remained unchanged. SDT, explains 20% of the variability. Specifically, this factor is filled with indicators of the age structure, the distance of the AFUR centre from Bratislava and the share of Roma. The last two named variables show a negative correlation with the values of the factor, i.e., the

higher the value of the relevant factor, the lower the share of Roma and the shorter the distance from Bratislava. The last factor we labelled as structural employment, which works in such a way that if its values increase, the share of employment in manufacturing decreases and the share of employment in PFE increases. This component explains 18% of the variability of the monitored indicators.

**Table 4** Results of the factor analysis of geographic, demographic/cultural, and economic conditions in 2001

Variable	Factor		
	Human capital	Second demographic transition	Structural employment
Share of university educated	0.85	0.20	0.08
Average nominal monthly wage	0.82	0.30	-0.08
Election result of SDKÚ in 2002	0.81	-0.09	0.22
Commuting index	0.80	0.08	0.42
Employment density	0.80	0.04	-0.40
FDI per 1000 inhabitants	0.78	0.17	0.27
Unemployment rate	-0.73	-0.21	0.50
Population size	0.69	0.10	0.49
Urbanisation rate	0.59	0.32	-0.19
Ageing index	0.00	0.97	0.00
Average age	0.14	0.96	0.05
Distance from Bratislava	-0.31	-0.69	0.32
Share of Roma communities	-0.32	-0.53	0.46
Share of manufacturing on employment	-0.06	0.07	-0.83
Share of PFE on employment	0.18	-0.11	0.74

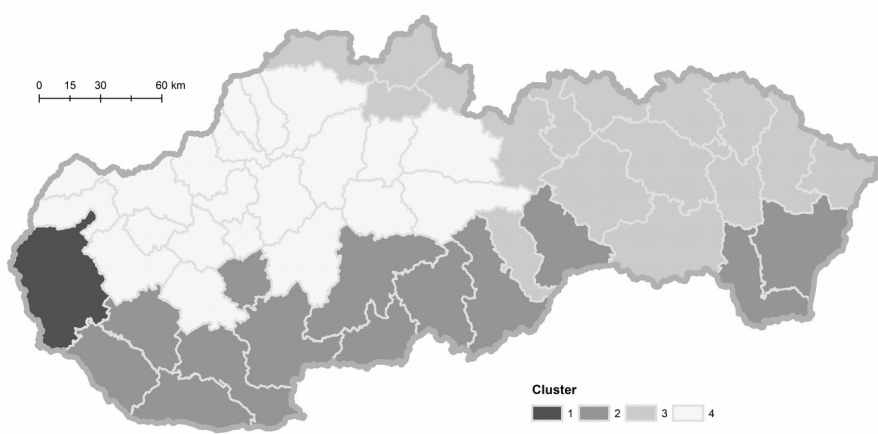
Source: Authors' calculations

Subsequently, we subjected our statistical set with the respective values of the components (Table 5) to a cluster analysis, the result of which you can follow in the form of a map in Figure 3. Bratislava AFUR stands out as a separate cluster again (cluster 1), which achieves significantly above-average values of the human capital factor, with above-average values of the SDT factor and a significantly high share of employment in foundational services (the capital as the seat of government institutions and ministries, or largest hospitals and universities) within structural employment factor. The regions of the manufacturing economy in the western part of Slovakia (cluster 4) are characterized by above-average human capital factors, an older population (within SDT factor) and a higher share of employment in manufacturing (above-average structural employment factor) due to manufacturing traditions

**Table 5** Values of the human capital, second demographic transition and the structural employment factors according to regional clusters in 2001

Factor	Cluster			
	1 (Bratislava region)	2 (regions of partial adaptation)	3 (lagging regions)	4 (regions of manufacturing economy)
Human capital	++ (4,77)	- (-0,83)	o (-0,12)	+ (0,38)
Second demographic transition	+ (0,71)	+ (0,72)	- (-1,21)	+ (0,45)
Structural employment	++ (2,81)	+ (0,78)	o (0,14)	- (-0,72)

Source: Authors' calculations (note as table 3)



**Figure 3** Regional clusters according to the human capital, second demographic transition and the structural employment factors in 2001.  
Source: Authors' calculations

(Smith, 1996). The north and most of the east part of the Slovak Republic are made up of lagging regions (cluster 3), where an acceptable value of the human capital factor (driven primarily by the hierarchically high-ranking city of Košice) is achieved, with lower values of the SDT factor (the cluster has a younger population that is more distant from Bratislava) and average values of the structural employment with balanced share employment in industry as well as in foundational services). Regions of partial adaptation (cluster 2) were formed in the south of the republic, where, due to the high unemployment rate, low wages, low volume of FDI and poor commuting (rather than cross-border cooperation with Hungarian regions), there is a below-average representation of the values related to the human capital factor. This spatial cluster is characterized by the oldest population and is relatively far away from the capital (in this part of the region there was practically no highway or expressway built during this period). The factor of structural employment has also

an above-average representation, which means that in this cluster there is a high share of employment in PFE (primarily due to high unemployment).

Now, have a look at the situation of contextual conditions representing geographic, demographic and cultural domains in 2021. The results indicate that the basic characteristics conditioning regional differences have not changed substantially (see Table 6). However, the SDT component is the dominant factor explaining up to 40% of the total variability, formed by variables such as ageing index, average age, share of Roma, distance from Bratislava and urbanization rate. The regional hierarchy component becomes less significant, explaining approximately 34% of the variability. The explanation may be that during the observed 20 years, the phenomenon of residential as well as commercial suburbanization worked, which deconcentrated the population as well as commercial activities more in the territory e.g. in Bratislava region (Šveda and Šuska, 2019). At the same time, many regions with metropolitan functions experienced a population decline, also known as urban shrinkage (Buček and Bleha, 2013; Bleha and Buček, 2023). In total, both factors explain 74% of the variability.

**Table 6** Results of the factor analysis of geographic and demographic conditions in 2021

Variable	Factor	
	Second demographic transition	Regional hierarchy
Ageing index	0.93	-0.15
Average age	0.93	-0.06
Share of Roma	-0.73	-0.24
Distance from Bratislava	-0.71	-0.23
Urbanisation rate	0.60	0.24
Commuting index	0.03	0.95
Population size	-0.08	0.90
Share of university educated	0.33	0.83
Election result of PS in 2023	0.60	0.70

Source: Authors' calculations

The changes described above were reflected in the partial rearrangement of some cluster's characteristics (see Table 7, Figure 4). Bratislava AFUR (cluster 1) still maintained its position with the highest value of the regional hierarchy factor. At the same time, the position of the region improved slightly in terms of the SDT factor. Migration to AFUR slowed down ageing, which, on the other hand, was more dynamic in most regions of Slovakia (Káčerová et al., 2022). That is why the Bratislava AFUR already reaches average values of this factor. The regional hierarchy factor was fully manifested in the cluster (cluster 4), which includes practically all regional centres (except Prešov). These regions with metropolitan functions are characterized by stronger supra-regional commuting and there is also a higher

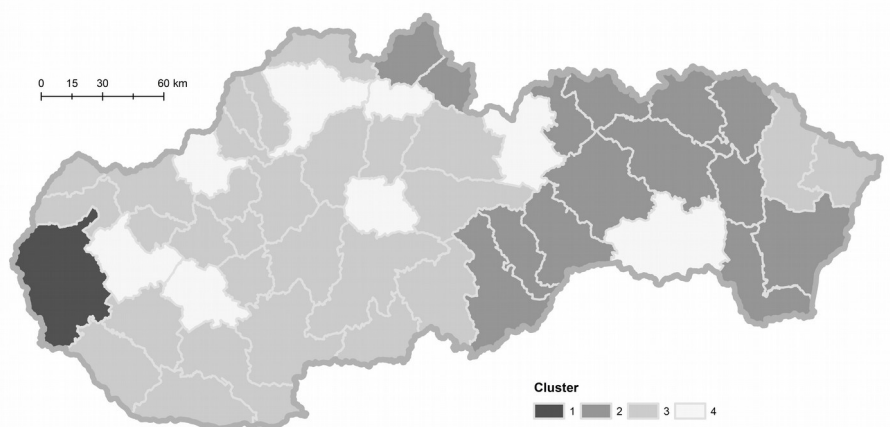


representation of the university-educated people. Because the urban population dominates this cluster, the population in these regions is slightly older than the average. The majority of western and central Slovakia consists of non-metropolitan regions (cluster 3) characterized by a below-average value of the regional hierarchy factor and at the same time an above-average value of the SDT factor. These regions are rather smaller in population, with a smaller share of university educated. The lower self-containment in terms of commuting is due to numerous interregional commuting flows (Halás and Klapka, 2020). Time availability to the capital city mainly helped to shorten the construction of the R1 expressway (Filčák et al., 2021), but the SDT factor (ageing) took place most intensively in this cluster. The last cluster (Cluster 2) represents the majority of regions with young populations in eastern Slovakia as well as some bordering AFURs in central Slovakia. From the point of view of the regional hierarchy factor, these are rather average regions. At the same time, these are more rural areas, more distant from Bratislava, where there is a larger share of Roma, who participate in slowing down the ageing process (SDT factor).

**Table 7** Values of the second demographic transition and regional hierarchy factors according to regional clusters in 2021

Factor	Cluster			
	1 (Bratislava region)	2 (regions with young population)	3 (non-metropolitan regions)	4 (regions with metropolitan functions)
Second demographic transition	o (-0,16)	-- (-1,37)	+ (0,61)	+ (0,30)
Regional hierarchy	++ (5,72)	o (-0,14)	- (-0,35)	+ (0,93)

Source: Authors' calculations (note as table 3)



**Figure 4** Regional clusters according to the second demographic transition and regional hierarchy factors in 2021. Source: Authors' calculations

Subsequently, we also added socio-economic conditions to the geographic, demographic, and cultural context for 2021 (see Table 8). Three factors were created again, which explain the total variability of 78%. The first component factor was labelled as a regional hierarchy (instead of the human capital factor in 2001). It was created by supplementing with variables such as the volume of FDI per 1000 inhabitants, average wage, and employment density and explains 35% of the analysed variables. The second component factor labelled as structural employment contains several new combinations of regional conditions, which explains 23% of the variability. Alongside the share of PFE and manufacturing employment is supplemented by the unemployment rate, the share of Roma and the distance from Bratislava. It is interesting that all contextual conditions, except for the share of employment in manufacturing, reached a positive pairwise correlation value, which means that their effects tend to influence each other, respectively, strengthen. The last component is made up of indicators of the age structure and the urbanisation rate. We called it the SDT factor, since the values of the factor are positively correlated with the degree of urbanization highlighting the fact that the urban environment has an older age structure. This component explains 20% of the variability.

**Table 8** Results of the factor analysis of geographic, demographic/cultural and economic conditions in 2021

Variable	Factor		
	Regional hierarchy	Structural employment	Second demographic transition
Commuting index	0.94	0.09	-0.03
FDI per 1000 inhabitants	0.88	-0.12	-0.06
Population size	0.87	0.13	-0.15
Share of university educated	0.85	0.00	0.33
Election result of PS in 2023	0.75	-0.34	0.41
Average nominal monthly wage	0.75	-0.36	0.23
Employment density	0.72	-0.15	0.27
Share of PFE	0.02	0.93	0.09
Share of manufacturing on employment	-0.27	-0.76	0.11
Unemployment rate	-0.33	0.74	-0.40
Share of Roma	-0.31	0.70	-0.41
Distance from Bratislava	-0.32	0.70	-0.33
Average age	0.02	-0.30	0.88
Ageing index	-0.07	-0.34	0.86
Urbanisation rate	0.28	0.06	0.76

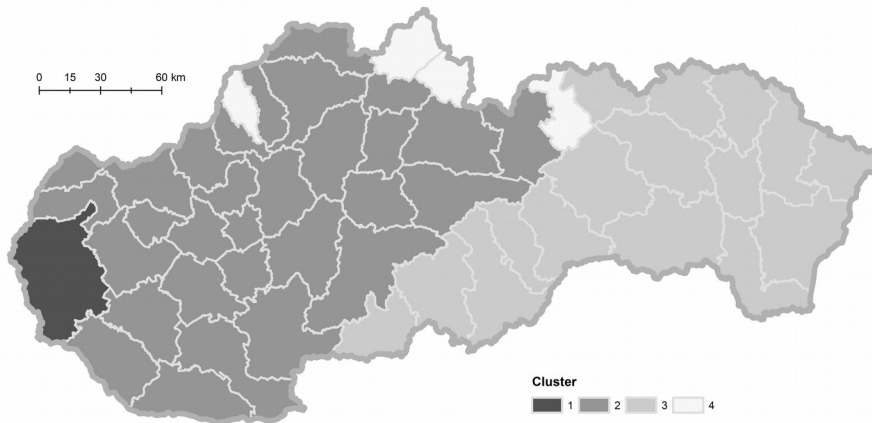
Source: Authors' calculations

The results after clustering the three component factors described above are quite interesting (see Table 9 and Figure 5). While in 2001 the clusters were only slightly spatially rearranged after the addition of socio-economic conditions, in 2021 the clusters created from the entire set of contextual conditions differ significantly from the origin geographic-demographic-cultural variables. The position of Bratislava (cluster 1), which has above-average value of regional hierarchy as well as structural employment factors, remains unchanged. At the same time, due to the influence of migration, the rate of ageing is slowing down, and therefore the Bratislava AFUR achieves a below-average value of the STD factor, due to population dynamics between the city and suburbs in the metropolitan area of Bratislava (Šveda and Barlík, 2018). Most of the western and central part of Central Slovakia is characterized as regions of manufacturing economy (cluster 2). Due to the influence of higher employment in manufacturing and overall low unemployment, a below-average structural employment factor was recorded. At the same time, this is a cluster where AFURs are the oldest on average. Cluster 3 is represented by lagging regions in the south of central Slovakia and practically the entire east of the country. This area is characterized by a below-average regional hierarchy factor accompanied by small volumes of foreign capital, and overall, a lower share of university-educated people and voter support of the PS party. The structural employment factor is represented significantly above average. In other words, the PFE is strongly represented in this territory, which may be the result of high unemployment and low quality of life. At the same time, the distance of the regions from this cluster to Bratislava is expensive. Since the SDT factor is underrepresented there, it is a relatively young living in rural areas. The last small cluster is represented by some peripheral regions in the north of Slovakia (cluster 4). The values of the regional hierarchy factor are more similar to cluster 2. Moreover, this cluster is characterized by its dominance a high share of employment in the manufacturing sector and a very young population.

**Table 9** Values of the regional hierarchy, structural employment and second demographic transition factors according to regional clusters in 2021

Factor	Cluster			
	1 (Bratislava region)	2 (regions of manufacturing economy)	3 (lagging regions)	4 (peripheral regions)
Regional hierarchy	++ (5,67)	o (0,04)	- (-0,40)	o (-0,10)
Structural employment	+ (0,41)	- (-0,46)	++ (1,09)	-- (-1,03)
Second demographic transition	- (-0,90)	+ (0,51)	- (-0,43)	-- (-1,89)

Source: Authors' calculations (note as table 3)



**Figure 5** Regional clusters according to the regional hierarchy, structural employment and second demographic transition factors in 2021. Source: Authors' calculations

## 5 DISCUSSIONS

We encounter the assessment of factors, mechanisms and processes conditioning regional development in many works. In the era of global interconnectedness concerning regional economies, the traditional division of factors into economic and non-economic ones is no longer sufficient to explain regional inequalities. It is more appropriate to consider “soft” and “hard” (Slach et al., 2013), or endogenous and exogenous factors (Vermeire et al., 2008), while the economic development of CEE regions has shifted to the importance of endogenous (soft) development factors (Smętkowski, 2018). Within the framework of the place-based policy paradigm, Churski et al. (2021) present a typology of regional development factors. Authors systematized a set of endogenous factors and concretized one meta-factor called as territorial capital that consists of human capital, social capital, material capital, financial capital, and innovations. Bodnár et al. (2021) devoted to the search for a connection between factors and resulting processes. Their results across NUTS3 regions in V4 countries show that two paths shape the target variable (economic development) directly: human capital as a proxy to R&D (weak positive effects) and economic capital representing employment in creative and knowledge-intensive industries (medium strong positive effects), while four factors do indirectly. The social capital factor had strong direct positive effects on human and economic capital. The demography factor representing population dynamics positively influenced human capital. To classify factors and resulting processes, the authors used the pyramid model of regional competitiveness proposed by Lengyel (2004). In the base, there

are natural, social and cultural conditions (success determinants), which indirectly affect the resulting events (economic outputs) forming the top of the pyramid in the long term. These success determinants are the ground for the manifestation of development (competitiveness) factors. A more direct relationship with short-term effects then exists between competitiveness factors and economic outputs.

Discussing the results of the spatial patterns of the conditioning factors is a more challenging task, as multiple regional contexts must be considered, including the comparison of different, often incompatible indicators and spatial units. It is important to realize that when evaluating uneven regional development, we should avoid static and binary explanations of differences between developed and less developed regions (Hadjimichalis, 2018). The concept of “core-periphery” should be seen as a theoretical construct explaining the complexity of dynamic processes and mechanisms and not as an essentialist category of knowledge. For a long time, economic geographers have been trying to divide space and create a regional typification of space in terms of various development factors, processes, and mechanisms. Special attention is paid to non-metropolitan regions because they represent a relatively numerous and internally very diverse group of regions, e.g. rural, tourist, non-metropolitan structurally weak regions, branch plant regions, and sheltered regions. These types of regions differ from each other in terms of key geographic factors, human capital, sources and mechanisms of knowledge creation and spillovers; therefore, they require specific targeted regional policy interventions. Their problem is small population/economic size, low density of institutions and missing critical mass for agglomeration effects, which does not allow the application of the same development models as in metropolitan regions (Ženka et al., 2017b). In a recent study, Grillitsch et al. (2021) are trying to develop an approach to detect systematic regional growth deviations, when residuals (outlier regions) are specific regional cases remote from the average development trend. The authors claim that the research of extreme cases can lead to the discovery of hitherto unobserved (hidden) structural factors, or mechanisms specific to a given region due to human agency and a unique combination of contextual conditions in time and space. Egye and Zsibók (2023) claim that the foundational economy is more represented in less developed regions, while tradable activities are more widespread in the so-called intermediate regions. The authors argue that reliance on low-value-added manufacturing activities does not guarantee prosperity in the long term. In less developed regions, it is necessary to harmonize the scale and scope of the foundational economy with the development potential of the tradable economy. A foundational economy is necessary, but not sufficient conditions for the development (Bosák et al., 2023).

## 6 CONCLUSIONS

In the article, we apply the approach of critical realism, which consistently distinguishes the role of contextual conditions (factors), causal mechanisms and general processes. Through factor analysis and cluster analysis, we emphasize the distinction

between geographic, demographic, cultural and economic conditions, which formed three conditioning factors with different explanatory power: regional hierarchy, structural employment, and second demographic transition (ageing). Three remarks are worth noting. First, the regional hierarchy factor increased in strength in 2021 (instead of the human capital factor in 2001), when the commuting index was positively correlated with wages, FDI, and employment density in both periods. It has been confirmed that the development paths of regional economies are based on FDI (Kotulič et al., 2016; Dudáš and Grančay, 2019), which seeks metropolitan regions with a larger population. Secondly, the structural employment factor expanded from the original two subfactors: share of employment in manufacturing and foundational services in 2001 to five subfactors in 2021. It is the PFE that is positively correlated with “new” phenomena such as unemployment, the share of Roma and the distance from Bratislava. This means that the existence of PFE acts as a stabilizing effect in dampening the growth of the unemployment rate and providing support for social inclusion in spatially segregated Roma communities. The share of people employed in manufacturing here represents a complementary segment of the labour market: regions with a dominance of employment in manufacturing lack employment in foundational services and vice versa. The same results were presented by Bosák et al. (2023) in the case of two Czech cities. The performance of the urban economy built on a competitive economy lacked development in the foundational economy and vice versa. Csabay et al. (2021) found that the least developed districts have a higher share of enterprise entities owned by associations, political parties and churches compared to the national share. On the other hand, the share of business entities in foreign and international private ownership in less developed regions is significantly lower compared to other districts and the entire country. Third, the component factor of SDT (ageing) remained positively correlated with the degree of urbanization, while, based on pairwise correlations, demographic subfactors have a closer relationship with the component factor of structural employment than with the component factor of regional hierarchy and FDI. Overall, we can state that in 2001 and 2021, two groups of factors shaped regional inequalities:

- sources of economic growth in the form of regional hierarchy and “metropolisation” of FDI are tied to the university-educated people and voters of the Progressive Slovakia party.
- sources of social protection in the form of structural employment (complementary relation between share PFE employment and share manufacturing employment) are tied to the ageing and inclusive of the spatial excluded Roma population.

In the context of cluster analysis, our research revealed some outlier positions of regions. Three notes are offered. First, we observe the extreme dominance of the Bratislava region, which created a single cluster. The role of the west-east gradient and the settlement hierarchy dividing Slovakia into ‘two worlds’: rich (south)west – poor (north)east regions, especially Bratislava region and the rest of Slovakia (influence of horizontal geographical location). This means that the deepening or reduction of regional inequality is determined top-down due to the geographic factors and

economic size and structure of Bratislava (Rusnák et al., 2023). Secondly, it makes sense to conduct case studies of peripheral regions with outliers, because they combine region-specific development conditions that are useful to analyse with qualitative methods (Rutten, 2020). An example is the Orava region, where non-market cooperative social networks and survival strategies are applied (Rochovská et al., 2016). Thirdly, even though we identified two numerous groups of regions located in the west and the north of central Slovakia, respectively in the east of Slovakia, they are internally heterogeneous with specific needs and shortcomings. An example can be research aimed at analysing the transport accessibility of municipalities and excluded communities in eastern Slovakia (Rusnáková and Rochovská, 2016; Horňák et al., 2023), analysis of the support of inter-municipal cooperation in the effective acquisition of financial support (Klamár et al., 2019), disparities in allocation and drawing EU Structural Funds and the State Budget (Michálek, 2014), or various strategies to adaptation to urban shrinkage in old and young mining cities (Buček et al., 2022).

What recommendations result from our analysis for regional policymakers? Political decisions that try to balance regional inequalities in the short term at the cost of losing economic efficiency in the long term are not socially reasonable. Enormous efforts to implement the policy of the welfare state (e.g. free trains, recreation allowances, tax bonus), will not increase the quality of life of the region's inhabitants, but rather it will increase their dependence on the social system. Following Act No. 336, 2015 on the support of the least developed districts (Finka et al., 2020), referring to high unemployment, regional contributions provided to municipalities do not necessarily lead to a reduction in the number of registered job applicants. On the other side creating job opportunities at any cost through FDI is not a reasonable development strategy. We stated above that the unemployment rate or wage level as a socio-economic outcome is a consequence of the regions' geographical and demographic potentials.

It is necessary to focus attention on caring for long-term sources of economic growth and social protection (events, outcomes) through improving the quality of human capital in two ways. First, it is important to have a long-term strategy to ensure adaptability in the fight against the ageing process, which progresses to urban environments and becomes a potential threat of labour shortages. As a result of the transfer of age cohorts, the so-called Husák's children into the post-productive age category (ageing from the top, or from the middle), some regions do not reach the critical mass of the population, including the productive workforce and consumers, necessary to ensure the functioning of market interactions. We are already observing this trend in the retail services in rural and peripheral areas that lead to the formation of food (social) deserts (Bilková et al., 2017). This can have an impact on selective labour mobility and migration of the young population, which in turn leads to an intergenerational decline in total fertility (Šprocha and Ďurček, 2017). It follows that human capital is both a cause and an effect of uneven development.

Second, if we want to improve the quality of human capital and maintain it in Slovakia, it is necessary to fundamentally improve the system of education, research

and innovation, which will reflect the demands of the labour market in connection with the challenge of digital transformation and the green transition (Halásová and Straka, 2021). It seems that governments try to relieve the effects and not treat the causes. They are still “postponing” investment projects in human capital development. Is it because the results have been waiting at least 15-20 years and they only have a mandate of four years?

In the paper, we did not deal with institutional factors. Among other things, these are mentioned when creating conditions for increased absorption capacity, especially in problem regions, and active cooperation of regional policy actors at all hierarchical levels (Rajčáková and Švecová, 2018). Identifying and processing institutional factors is a call for further research.

### Acknowledge

*VEGA 1/0252/2023 Spatial systems resilience – its factors, differentiation, and consequences*

### References

- BALÁŽ, V., LICHNER, I., JECK, T. 2023. Geography of migration motives: Matching migration motives with socioeconomic data. *Moravian Geographical Reports*, 31, 3, 141-152.
- BILKOVÁ, K., KRIŽAN, F., BARLÍK, P., HORNÁK, M., ZEMAN, M., ZUBRICZKÝ, G. 2017. Za nákupom ďaleko: rurálne potravinové púšte na Gemeri. *Geografický časopis*, 69, 1, 3-20.
- BIRCH, K., MYKHENKO, V. 2009. Varieties of neoliberalism? Restructuring in large industrially dependent regions across Western and Eastern Europe. *Journal of economic geography*, 9, 3, 355-380.
- BLAŽEK, J., HAMPL, M. 2009. Types and systems of actors in regional development: their function and regulatory potential. *European Spatial Research and Policy*, 16, 1, 75-92.
- BLEHA, B., BUČEK, J. 2023. Depopulation differences in Slovak former mining cities. The role of geographical conditions and local interventions. *Papers in Applied Geography*, 1-19.
- BODNÁR, G., KOVÁCS, P., EGRI, Z. 2022. Elements of Endogenous Development in the Regions of Visegrad Countries. *DETUROPE: Central european journal of tourism and regional development*, 14, 1, 29-49.
- BOŠÁK, V., SLACH, O., PASZOVÁ, L., HÝLLOVÁ, L., MYKHENKO, V., KRTIČKA, L., NOVÁČEK, A. 2023. Coping with peripheralization in small cities. What is the role of human agency? *European Planning Studies*, 1-21.
- BOSCHMA, R. A. 2005. Proximity and innovation: a critical assessment, *Regional Studies*, 39, 61-74
- BÖHLE, D., GRESKOVITS, B. 2007. Neoliberalism, embedded neoliberalism and neocorporatism: Towards transnational capitalism in Central-Eastern Europe. *West European Politics*, 30, 3, 443-466.
- BUČEK, J., BLEHA, B. 2013. Urban Shrinkage as a Challenge to Local Development Planning in Slovakia. *Moravian Geographical Reports*, 21, 1, 2-15.
- BUČEK, J., BLEHA, B., RICHTER, M. 2022. Coping with shrinkage in old and young mining cities in Slovakia: The cases of Banská Štiavnica and Prievidza. In *Postsocialist Shrinking Cities*. London: Routledge, 276-294.



- BUČEK, J., PLEŠIVČÁK, M. 2017. Self-government, Development and Political Extremism at the Regional Level: A Case Study from the Banská Bystrica Region in Slovakia. *Sociológia – Slovak Sociological Review*, 49, 6, 599-635.
- BUZALKA, J. 2023. *Postsedliaci*. Bratislava: Mamaš.
- CSABAY, M., VINCÚROVÁ, Z., STOCH, M., STEHLÍKOVÁ, B. 2021. Enterprise ownership patterns in the least developed districts of Slovakia. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 16, 4, 807-838.
- COOKE, P. 1989. *Localities: the changing face of urban Britain*. London: Unwin Hyman.
- CRONON, W. 1991. *Nature's metropolis: Chicago and the Great West*. New York: WW Norton & Company.
- DELGADO, M., PORTER, M. E., STERN, S. 2010. Clusters and entrepreneurship. *Journal of economic geography*, 10, 4, 495-518.
- DELGADO, M., PORTER, M. E., STERN, S. 2016. Defining clusters of related industries. *Journal of Economic Geography*, 16, 1, 1-38.
- DUDÁŠ, T., GRANČAY, M. 2019. Regional structure of foreign direct investment in Slovakia—a district-level gravity-type model 2009–2016. *Ekonomický časopis*, 67, 8, 811-836.
- ĎURČEK, P., BLEHA, B. 2013. Regionálna nerovnomernosť vybraných demografických javov v Európskej únii. *Geografický časopis*, 65, 1, 3-22.
- ĎURČEK, P., ŠPROCHA, B. 2017. Centrá a zázemia funkčných mestských regiónov na Slovensku optikou kohortnej plodnosti. *Geografický časopis*, 69, 3, 225-244.
- EASTON, G. 2010. Critical realism in case study research. *Industrial marketing management*, 39, 1, 118-128.
- EGYED, I., ZSIBÓK, Z. 2023. Exploring firm performance in Central and Eastern European regions: a foundational approach. *Hungarian Geographical Bulletin*, 72, 3, 257-285.
- Elections and Referenda, 2023. *The elections to the national council of the Slovak republic*. [online] [cit. 2023-11-10]. Available at: <<https://volby.statistics.sk/index-en.html>>
- EZCURRA, R., PASCUAL, P., RAPÚN, M. 2007. The dynamics of regional disparities in Central and Eastern Europe during transition. *European Planning Studies*, 15, 10, 1397-1421.
- FILČÁK, R., ROCHOVSKA, A., HORŇÁK, M. 2021. Evaluation of Slovakia's R1 expressway enhancement impacts on local socio-economic development: expert panel approach. *Geografie*, 126, 1, 29-53.
- FINKA, M., HUSÁR, M., SOKOL, T. 2020. Program for lagging districts as a framework for innovative approaches within the state regional development policies in Slovakia. *Sustainability*, 12, 13, 5419.
- FRATESI, U., RODRÍGUEZ-POSE, A. 2016. The crisis and regional employment in Europe: what role for sheltered economies? *Cambridge journal of regions, economy and society*, 9, 1, 33-57.
- GONG, H., HASSINK, R. 2020. Context sensitivity and economic-geographic (re) theorising. *Cambridge journal of regions, economy and society*, 13, 3, 475-490.
- GONG, H., HASSINK, R., FOSTER, C., HESS, M., GARRETSEN, H. 2022. Globalisation in reverse? Reconfiguring the geographies of value chains and production networks. *Cambridge journal of regions, economy and society*, 15, 2, 165-181.
- GRILLITSCH, M., MARTYNOVICH, M., FITJAR, R. D., HAUS-REVE, S. 2021. The black box of regional growth. *Journal of Geographical Systems*, 23, 425-464.
- HADJIMICHALIS, C., 2018. "New" Questions of Peripherality in Europe or How Neoliberal Austerity Contradicts Socio-Spatial Cohesion. In T. Lang, F. Görmar eds., *Regional and Local Development in Times of Polarisation; Re-Thinking Spatial Policies in Europe*. *Palgrave Macmillan*, 61-78.
- HALÁS, M., KLAPKA, P. 2020. Heterogenita a kontinuita geografického priestoru: príklad funkčných regiónov Slovenska. *Geografie*, 125, 3, 319-342.

- HALÁS, M., Klapka, P., BAČÍK, V., KLOBUČNÍK, M. 2017. The spatial equity principle in the administrative division of the Central European countries. *PLoS one*, 12, e0187406. DOI: <https://doi.org/10.1371/journal.pone.0187406>
- HALÁSOVÁ, B., STRAKA, D. 2021. *Komplexná analýza stavu výskumu a inovácií v SR*. Bratislava: SOVVA (Slovenská organizácia pre výskumné a vývojové aktivity) (in Slovak).
- HAMPL, M. 1996. Geography of Societal Transformation: General Question of Study. *Geografie*, 101, 2, 82-91.
- HAMPL, M. 1998. *Realita, spoločnosť a geografická organizácia: hľadanie integrálneho rádu*. Praha: DemoArt, Přírodovědecká fakulta Univerzity Karlovy.
- HAMPL, M., BLAŽEK, J., ŽÍŽALOVÁ, P. 2008). Faktory-mechanismy-procesy: aplikace konceptu kritického realizmu. *Ekonomický časopis*, 56, 7, 696–711.
- HANSEN, T. 2022. The foundational economy and regional development. *Regional Studies*, 56, 6, 1033-1042.
- HARVEY, D. 1982. *The Limits to Capital*. London: Verso
- HARVEY, D. 2005. *A Brief History of Neoliberalism*. Oxford: Oxford University Press.
- HERODOWICZ, T., KONECKA-SZYDŁOWSKA, B., CHURSKI, P., PERDAŁ, R. 2021. Political Divisions and Socio-Economic Disparities in Poland: A Geographical Approach. *Sustainability*, 13, 13604.
- HORNÁK, M., HLUŠKO, R., ROCHOVSKÁ, A., LELKESOVÁ, V. 2023. Public transport accessibility and spatial exclusion in Roma settlements: A case study of three regions in Eastern Slovakia. *Moravian Geographical Reports*, 31, 1, 27-38.
- HUDSON, R. 2005. *Economic Geographies. Circuits, Flows and Spaces*. London: Sage.
- MATLOVIČ, R., KLAMÁR, R., KOZOŇ, J., IVANOVÁ, M., MICHALKO, M. 2018. Spatial polarity and spatial polarization in the context of supranational and national scales: regions of Visegrad countries after their accession to the EU. *Bulletin of Geography. Socio-economic series*, 41, 59-78.
- MYRDAL, G. 1957. *Economic theory and under-developed regions*. London: Duckworth.
- CHURSKI, P., HERODOWICZ, T., KONECKA-SZYDŁOWSKA, B., PERDAŁ, R. 2021. *European Regional Development: Contemporary Regional and Local Perspectives of Socio-Economic and Socio-Political Changes*. Springer Nature.
- KÁČEROVÁ, M., MLÁDEK, J., KUSEDOVÁ, D. 2022. Temporal and spatial analysis of population ageing and growing younger in Slovakia. *Folia Geographica*, 64, 1, 112-130.
- KOISOVÁ, E., MASÁROVÁ, J., IVANOVÁ, E. 2021. Socio-demographic potential of human resources in the Visegrad regions. *Journal of Business Economics and Management*, 22, 4, 1026-1046.
- KLAMÁR, R., MATLOVIČ, R., IVANOVÁ, M., IŠTOK, R., KOZOŇ, J. 2019. Local Action Group as a Tool of Inter-municipal Cooperation: Case Study of Slovakia. *Folia Geographica*, 61, 1, 36.
- KOTULIČ, R., ADAMIŠIN, P., DUBRAVSKÁ, M., KRAVČÁKOVÁ VOZÁROVÁ, I., VAVREK, R. 2016. Status of foreign direct investments and their relationship to selected economic indicator of the sustainable development in the Slovak Republic-localization factors of foreign direct investment allocation and their spatial differentiation. *Journal of applied economic sciences*, 11, 1, 86-96.
- KRUGMAN, P. 1991. *Geography and Trade*. Cambridge: MIT Press.
- LENGYEL, I. 2004. The pyramid model: enhancing regional competitiveness in Hungary. *Acta Oeconomica*, 54, 3, 323-342.
- LUKNIŠ, M. 1985. Regionálne členenie Slovenskej socialistickej republiky z hľadiska jej racionálneho rozvoja. *Geografický časopis*, 37, 2-3, 137-163.
- MARTYNOVICH, M., HANSEN, T., LUNDQUIST, K. J. 2023. Can foundational economy save regions in crisis? *Journal of Economic Geography*, 23, 3, 577-599.
- MASSEY, D. 1984. *Spatial divisions of labor: Social structures and the geography of production*. London: Macmillan.

- MICHÁLEK, A. 2014. Disparity v alokácii a čerpaní zdrojov s dôrazom na marginálne regióny Slovenska. *Geografický časopis*, 66, 3, 269-286.
- MORVAY, K., HUDCOVSKÝ, M. 2022. Impact of the Recession on the Labour Market: Less Work Without Increasing Unemployment in Slovakia. *DANUBE*, 13, 3, 240-255.
- MUKUMBANG, F. C. 2023. Retroductive theorizing: a contribution of critical realism to mixed methods research. *Journal of Mixed Methods Research*, 17, 1, 93-114.
- NBS, 2023. *National bank of Slovakia*. [online] [cit. 2023-11-10]. Available at: <<https://nbs.sk/en/statistics/selected-macroeconomics-indicators/macroeconomic-database/>>
- NOSEK, V., NETRDOVÁ, P. 2018. Vývojové pravidelnosti a špecifika geografické diferenciácie obyvateľstva a jeho štruktúry na úrovni obcí v Česku v transformačnom období. *Geografie*, 123, 2, 225-251.
- NÖLKE, A., Vliegenthart, A. 2009. Enlarging the varieties of capitalism: The emergence of dependent market economies in East Central Europe. *World politics*, 61, 4, 670-702.
- PAVLÍNEK, P. 2020. Restructuring and internationalization of the European automotive industry. *Journal of Economic Geography*, 20, 2, 509-541.
- PECK, J., ZHANG, J. 2013. A variety of capitalism... with Chinese characteristics? *Journal of Economic Geography*, 13, 3, 357-396.
- PLEŠIVČÁK, M. 2011. Postavenie regiónov Slovenska z hľadiska území volebnej podpory politických strán v parlamentných voľbách v rokoch 2002-2010. *Geografický časopis*, 63, 3, 227-251.
- POCIŪTĚ-SEREIKIENĖ, G. 2019. Peripheral regions in Lithuania: the results of uneven development. *Regional Studies, Regional Science*, 6, 1, 70-77.
- Population and Housing Census, 2001a. *Commuting*. Internal database
- Population and Housing Census, 2001b. *Economically active population by education*. Internal database.
- Population and Housing Census, 2023a. *Commuting to work*. [online] [cit. 2023-11-10]. Available at: <<https://www.scitanie.sk/en>>
- Population and Housing Census, 2023b. *Economically active population by education*. [online] [cit. 2023-11-10]. Available at: <<https://www.scitanie.sk/en>>
- PORTER, M. E. 1990. *The Competitive Advantage of Nations*. New York: The Free Press.
- RAJČÁKOVÁ, E., ŠVECOVÁ, A. 2018. Ľudské zdroje-regionálne disparity v kontexte politiky súdržnosti EÚ 2007-2013 na Slovensku. *Geografický časopis*, 70, 1, 79-96.
- REHÁK, Š., RAFAJ, O., ČERNĚNKO, T. 2021. EU integration, regional development problems and the rise of the new radical right in Slovakia. *Regional Science Policy & Practice*, 13, 303-321.
- ROCHOVSKÁ, A., DRGONCOVÁ, M., DŽUPINOVÁ, E., HORŇÁK, M., KÁČEROVÁ, M., MADZINOVÁ, M., MAJO, J., ONDOŠ, S. 2016. *One place many worlds. Geographical variability of life strategies in Slovak society*. Bratislava (Univerzita Komenského v Bratislave).
- RUSNÁK, J., KOREC, P., PLEŠIVČÁK, M. 2023. The trade-off between national growth and interregional inequality: Three decades of regional development in Slovakia. *Geografický časopis*, 75, 3, 291-311.
- RUSNÁKOVÁ, J., ROCHOVSKÁ, A. 2016. Sociálne vylúčenie, segregácia a životné stratégie obyvateľov rómskych komunit z pohľadu teórie zdrojov. *Geografický časopis*, 68, 3, 227-243.
- RUTTEN, R. 2020. Comparing causal logics: A configurational analysis of proximities using simulated data. *Zeitschrift für Wirtschaftsgeographie*, 64, 3, 134-148.
- SAYER, A. 2000. *Realism and Social Science*. London: Sage.
- SLACH, O., RUMPEL, P., KOUTSKÝ, J. 2013. *Profilace měkkých faktorů regionálního rozvoje*. Ostrava: Accendo.

- SMĘTKOWSKI, M. 2018. The role of exogenous and endogenous factors in the growth of regions in Central and Eastern Europe: the metropolitan/non-metropolitan divide in the pre- and post-crisis era. *European Planning Studies*, 26, 2, 256-278.
- SMITH, A. 1996. From convergence to fragmentation: uneven regional development, industrial restructuring, and the 'transition to capitalism' in Slovakia. *Environment and Planning A*, 28, 1, 135-156.
- SOSR, 2023. *Demographic and social statistics*. [online] [cit. 2023-11-10]. Available at: <<https://datacube.statistics.sk/>>
- SOTARAUTA, M., GRILLITSCH, M. 2023. Path tracing in the study of agency and structures: Methodological considerations. *Progress in Human Geography*, 47, 1, 85-102.
- STORPER, M. 1997. *The regional world: Territorial development in a global economy*. New York: Guilford Press.
- STORPER, M., VENABLES, A. J. 2004. Buzz: face-to-face contact and the urban economy. *Journal of economic geography*, 4, 4, 351-370.
- ŠTEFANČÍK, R., STRADIOTOVÁ, E. 2022. The far-right and the roma; reflection of anti-roma rhetoric in electoral behaviour in Slovakia. *Acta Geographica Universitatis Comenianae*, 66, 2, 165-186.
- ŠVEDA, M., BARLÍK, P. 2018. Daily commuting in the Bratislava metropolitan area: case study with mobile positioning data. *Papers in Applied Geography*, 4, 4, 409-423.
- ŠVEDA, M., ŠUŠKA, P. eds. 2019. *Suburbanizácia: ako sa mení zázemie Bratislavy?* Bratislava: Geografický ústav SAV. 297 s.
- The Atlas of Roma communities, 2004. *The Slovak Government Plenipotentiary for Romani Communities*. [online] [cit. 2023-11-10]. Available at: <<https://www.romovia.vlada.gov.sk/atlas-romskych-komunit/>>
- The Atlas of Roma communities, 2019. *The Slovak Government Plenipotentiary for Romani Communities*. [online] [cit. 2023-11-10]. Available at: <<https://www.romovia.vlada.gov.sk/atlas-romskych-komunit/>>
- VAN MEETEREN, M., KLEIBERT, J. 2022. The global division of labour as enduring archipelago: thinking through the spatiality of 'globalisation in reverse'. *Cambridge journal of regions, economy and society*, 152, 2, 389-406.
- VERMEIRE, B., GELLYNCK, X., DE STEUR, H., VIAENE, J. 2008. The role of social capital assets in reconciling endogenous and exogenous drivers of rural renewal. In: *8th European IFSA Symposium, 6 - 10 July 2008*, Clermont-Ferrand, France. Dostupné na: <[http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2008/2008\\_WS6\\_06\\_Vermeire.pdf](http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2008/2008_WS6_06_Vermeire.pdf)>
- YEUNG, H. W. C. 2019a. What kind of theory for what kind of human geography? *Dialogues in Human Geography*, 9,3, 283-292.
- YEUNG, H. W. C. 2019b. Rethinking mechanism and process in the geographical analysis of uneven development. *Dialogues in Human Geography*, 9, 3, 226-255.
- YEUNG, H. W. C. 2021. The trouble with global production networks. *Environment and Planning A: Economy and Space*, 53, 2, 428-438.
- YEUNG, H. W. C. 2023. Why is causal explanation critical in/to economic geography? *Environment and Planning A: Economy and Space*, 0308518X231191923.
- WILLIAMS, A. M., BALÁŽ, V. 1999. Privatisation in Central Europe: different legacies, methods, and outcomes. *Environment and Planning C: Government and Policy*, 17, 6, 731-751.
- WILLIAMSON, J. G. 1965. Regional inequalities and the process of national development. *Economic Development and Cultural Change*, 13, 3-45.
- ZARYCKI, A. 2007. History and regional development. A controversy over the 'right' interpretation of the role of history in the development of the Polish regions. *Geoforum*, 38, 3, 485-49.
- ZHOU, Y., LIN, G. C., ZHANG, J. 2019. Urban China through the lens of neoliberalism: Is a conceptual twist enough? *Urban Studies*, 56, 1, 33-43.

- 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.
- ŽENKA, J., NOVOTNÝ, J., SLACH, O., IVAN, I. 2017a. Spatial distribution of knowledge-intensive business services in a small post-communist economy. *Journal of the Knowledge Economy*, 8, 385-406.
- ŽENKA, J., SLACH, O., SOPKULIAK, A. 2017b. Typologie českých nemetropolitních regionů z hlediska faktorů, mechanismů a aktérů regionálního rozvoje. *Geografie*, 122, 3, 281-309.

## **Hľadanie súvislostí vo výskume regionálnych nerovností na Slovensku: aplikácia konceptu kritického realizmu**

### **Súhrn**

V našom článku sme sa zamerali na identifikáciu a analýzu podmieňujúcich faktorov (javov), ako aj regionálnych výsledkov prostredníctvom faktorovej analýzy a zhlukovej analýzy. Výsledky odhalili vplyv troch podmieňujúcich faktorov: regionálna hierarchia, štrukturálna zamestnanosť a druhý demografický prechod (starnutie). Prvý faktor je výsledkom pozitívnej korelácie indexu dochádzky, priemernej mesačnej mzdy, priamych zahraničných investícií a hustoty zamestnanosti v oboch obdobiach. Pozoruhodný je trend rastu významu subfaktorov dochádzky za prácou, priamych zahraničných investícií a veľkosti populácie medzi rokmi 2001 a 2021. Druhý faktor štrukturálnej zamestnanosti pozitívne koreluje s fenoménmi ako napr. nezamestnanosť, podiel Rómov a vzdialenosť od Bratislavy. Dôležitá je skutočnosť, že podiel ľudí zamestnaných vo výrobe tu predstavuje doplnkový segment trhu práce pretože sa v rámci párových korelácií má opačný efekt. V regiónoch, kde prevláda zamestnanosť vo výrobe absentuje zamestnanosť v službách základnej ekonomiky a naopak. Po tretie, subfaktory druhého demografického prechodu pozitívne korelujú so stupňom urbanizácie, čo potvrdzuje predchádzajúce výskumy, že mestské prostredie má staršiu vekovú štruktúru. Celkovo môžeme konštatovať, že v rokoch 2001 a 2021 sa objavili dve skupiny faktorov formujúcich regionálne nerovnosti: (1) zdroje ekonomického rastu v podobe regionálnej hierarchie a metropolizácie PZI, ktoré sú viazané na vysokoškolsky vzdelaných ľudí a voličov strany Progresívne Slovensko a (2) zdroje sociálnej ochrany v podobe štrukturálnej zamestnanosti pri tlení rastu miery nezamestnanosti a podpore sociálnej inklúzie priestorovo segregovaných rómskych komunít, ale na úkor ekonomického rastu.

V kontexte klastrovej analýzy náš výskum odhalil niektoré odľahlé pozície regiónov. Opätovne sa potvrdila extrémna dominancia regiónu Bratislava, ktorý vytvoril jeden zhluk. Západo-východný gradient a sídelná hierarchia naďalej rozdeľuje Slovensko na „dva svety“: bohaté (juho)západné – chudobné (severo)východné regióny. To znamená, že prehľbovanie alebo znižovanie regionálnej nerovnosti je determinované zhora nadol vzhľadom na geografické faktory a ekonomickú veľkosť a štruktúru Bratislavy. Po druhé, má zmysel realizovať prípadové štúdie periférnych regiónov s odľahlými hodnotami, pretože kombinujú podmienky rozvoja špecifické pre daný región, ktoré je užitočné analyzovať pomocou kvalitatívnych metód. Príkladom je región Orava, kde sa uplatňujú netrhové kooperatívne sociálne siete a stratégie prežitia. Po tretie, aj keď sme identifikovali dve početné skupiny regiónov ležiace na západe a na severe stredného Slovenska, resp. na východe Slovenska, ide o vnútorne heterogénne regióny so špecifickými potrebami a nedostatkami.