



# THREE DECADES OF ECONOMIC CHANGES OF RURAL SLOVAKIA

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**Abstract.** The economy has been developing exceptionally dynamically in recent decades. In the Central European countries of the former Eastern Bloc, the transformation from a centrally planned to a market economy contributed to these dynamics after 1989. Despite a large number of analyses at the national level or in particular cities, the impact of this development on rural areas has yet to be researched. This study aims to contribute to filling this gap. Its goal is to estimate and assess the development of the number, spatial distribution, and sectoral structure of jobs in the Slovak rural areas over the period 1991-2021. The study uses two approaches to the definition of rural municipalities and explores spatial differentiation of changes. Analysing data on the economically active population and commuting to work, both based on sectoral structure, provides a reliable basis for making qualified estimates regarding the quantity and composition of jobs, even at the local level. The study confirms that municipalities considered rural administratively showed neutral or positive changes in the number of jobs and strong shift from agricultural to diversified rural economy. However, positive changes were mainly driven by suburban areas. When excluding them from consideration, rural municipalities show a rapid decline in the number of jobs and changes in the sectoral structure driven mainly by the decrease in agricultural jobs.

**Keywords:** employment, post-socialist economy, sectoral structure, rural areas, rural regions, Slovakia.

## Introduction

Despite variations in definition (cf. Copus et al., 2006; Dijkstra & Poelman, 2008; Novotný et al., 2015; Giannakis & Bruggeman, 2020), rural areas encompass a significant majority of the European Union's territory and are home to a significant proportion of its population. The EU recognizes the challenges faced by rural areas as an integral part of the identity of a country, serving as the residence for many EU citizens, and hosting a significant portion of economic activities. Consequently, the EU establishes policies aimed at fostering the development of a strong, connected, prosperous, and resilient rural areas (EU, 2023). This plan also emphasizes the diversity of the rural areas by identifying suburban areas, rural areas close to cities and remote rural areas. Both categories of rural areas are together covering more than 80% of the EU's land area and are home to around 30% of its population. Such diversity is characteristic of Slovakia as well, while it is further enhanced by the considerable differentiation of the country's landscape.

It is clear that rural areas have undergone a complex transformation, marked by changes in the sectoral structure of the economy, an unprecedented penetration of technologies and advanced knowledge into all sectors, and a spatial relocation of economic activities, mostly in favour

of metropolitan regions. Consequently, many rural areas have been faced with emigration, an outflow of human capital, population aging, and, in general, the search for a new economic identity. In the countries of Central and Eastern Europe (CEEC) that were once part of the former Eastern Bloc, this transformation has been further intensified by the complex transition from a centrally planned to a market economy and from a socialist regime to a democracy.

Despite these well-known facts, few studies address the transformation of the rural economy, and the existing ones often focus primarily on changes in agriculture and land use (cf. Hruška & Czapiewski, 2015; Hruška et al., 2015). This is also due to the lack of reliable statistical data at such spatial level that would enable a comprehensive assessment of the changes taking place in the rural areas (Novotný et al., 2021).

The ambition of this study is to contribute to a more comprehensive understanding of economic development in rural areas. Its goal is to estimate and assess the development of the number, spatial distribution, and sectoral structure of jobs in the Slovak rural municipalities over the period 1991-2021. The study takes into account the varying approaches to defining and delimiting rural areas, thus it employs two distinct methods for defining rural municipalities in Slovakia. The study endeavours to answer the following research questions: (a) What is the relationship between the growth of the economically active population (EAP) and the corresponding increase in job numbers in rural municipalities? (b) How has the sectoral structure of jobs in rural areas evolved over the observed time period? (c) Are there distinct differences in the observed changes based on the varying approaches used to define rural municipalities? (d) Is there a discernible pattern of the spatial differentiation of the observed changes?

## **Theoretical background**

The Industrial revolution spread across the Western Europe and Anglo-Saxon America by the early 19th century, but there were several regions in Eastern Europe which economies were mostly agrarian even at the beginning of the 20<sup>th</sup> century. The territory of Slovakia was the more industrial part of the medieval Hungarian monarchy thanks to the mining and processing of mineral raw materials. However, after the establishment of Czechoslovakia in 1918, in comparison with the Czech part, its territory was much more agrarian. This continued even after World War II. Czechia was also among the most urbanized areas in the socialist realm, but largely agrarian Slovakia was among the least urbanized (Musil, 1980). Thus, the state policies during socialism aimed to narrow the gap between the two parts of Czechoslovakia by promoting rapid industrialization and urban growth in Slovakia (Novotný, 2016). And it is precisely the consequences of socialist policies in the field of economy and territorial development, whose impact on rural development has been significant in the past decades. Therefore, in the next section, we bring closer the development in the socialist period that preceded the period analysed in this study.

### **Socialist economy and post-socialist transformation in Slovakia**

Socialist regimes in CEEC utilised the industrial sector as a tool for modernization and catching up with more economically developed Western countries. In most socialist countries, towns and cities were preferred over rural communities when developing infrastructure and locating industry (Kovács, 2009). After 1950, rapid industrialisation, particularly in the Slovak part of Czechoslovakia, resulted in significant centralisation of economic activities and involved strong migration from rural areas to main industrial centres (Podolák, 2006). So, while deindustrialization and tertiar-

ization have characterized advanced Western economics since the 1960s (Alderson, 2005; Barta et al., 2008; Tregenna, 2011), the role of industrial sector continued to grow even in the following decades in then socialist countries (cf. Klein et al., 2017; Kospidis & Ivanov, 2017). Furthermore, under the initiatives of the communist regime in Czechoslovakia to augment the urban population share and secure an ample workforce for new industrial estates, a network of towns and selected central villages was established in which to concentrate the construction of dwellings and other investments. To stimulate demand for these residences, investment constraints were imposed in remaining villages, effectively amounting to a building prohibition and impeding the localization of economic activities (Podolák, 2006; Novotný, 2016).

In several countries of the former Eastern Bloc (including Poland and Hungary), large enterprises were nationalized, but at least small entrepreneurs could do business. In Czechoslovakia, however, practically all private business was nationalized. Until around 1960, the original private farmers' activities were integrated into the Unified Peasant Cooperatives, which served as the Czechoslovak version of collective farms. Due to losing private ownership, the farmers lost personal relations to the soil, farming and agriculture in general. This became particularly evident during the post-socialist transformation, manifesting as a decreased interest in pursuing agricultural work (cf. Malík, 2005; Novotná & Novotný, 2019).

Private enterprises of small tradesmen and entrepreneurs were also nationalized. In addition to nationalized subjects, new large industrial complexes were established and began to dominate the size structure of industrial enterprises. The location of these complexes was often given by a political decision, regardless of the geographical location conditions (rural municipalities were also sometimes industrialized in this way, although often without adequate transport infrastructure). Very often the economic base of the entire region was built on a single industrial complex, rendering it highly vulnerable during the post-socialist transformation period. In a centrally planned economy, the state determined all prices, which often did not reflect the real value of products and services, leading to inefficiency and resource wastage. Consequently, the Czechoslovak economy was highly demanding and inefficient in terms of raw materials and the number of workers. Additionally, the state regulated supplier-customer relations, thereby limiting competition and innovation. Due to the state policy of full employment, socialist enterprises experienced massive overemployment (Gonda et al., 2020). These factors coupled with the high share of the industrial sector—particularly heavy engineering, which encompasses arms production – and the low share of services in the economic structure (cf. Kunc et al., 2023), considerable material and energy intensity of production, underdeveloped transport and information infrastructure, and environmental degradation, collectively burdened the economy in the territory of Slovakia in the 1980s (Kopačka, 1996; Kulla, 2010). As a result, it struggled to compete with Western industrial production, posing a formidable obstacle during its transition to a market economy (Gonda et al., 2020). Furthermore, the collapse of socialism and the end of the Cold War drastically reduced the demand for weapons (Cupitt, 1993), prompting Slovakia to undergo a significant conversion away from arms production.

The post-socialist transformation was based on privatization, which ensured the rapid disintegration of large state complexes into several small ones in private ownership, but often led to their collapse (Williams & Baláž, 1999) and if the operations were preserved, they rapidly reduced overemployment, which was reflected in a sharp increase in unemployment. It rose sharply and in the early 2000s approached the level of up to 20% (Trading Economics, 2023a). The economic transformation resulted in a decline in regional specialization due to the disintegration and demise of large industrial complexes (Rusnák & Lehocký, 2019). Together with the post-socialist transformation, the challenge for the economy was to harmonize with the continuing intensive

development in the world (Kopačka, 1996). With the change in geopolitical orientation, the opening economy was exposed to an inexorable confrontation with the world.

The localization of economic activities was no longer determined solely by the state, but market mechanisms and conditions of the territory gained decisive role. The post-socialist transformation was also characterized by the development of the tertiary and quaternary sectors even though with a significant delay compared to Western market economies (Kunc et al., 2014; Hegyi-Kéri, 2016; Klein et al., 2017). Tertiariation and quarterization led to the decline of small towns and rural areas in many capitalist countries as well (cf. Lovell et al., 2018), the challenge was even greater for the post-socialist countryside or peripheral regions (Novotný et al., 2021). In the localization of new industrial activities, even in Slovakia, territories with favourable development dispositions and sufficient human capital have been increasingly preferred (Korec, 2005; Lesáková, 2008; Popjaková, 2008; Mišúnová & Mišún, 2009). This has been also evidenced by the localisation of the foreign direct investments which were directed primarily to the regions of major cities and towns as well as traditional industrial regions (Jacobs, 2018; Dudáš & Grančay, 2019)

In developed countries, there is a concentration of population and human capital in metropolitan regions, which (along with other processes) Gleaser (2011) refers to as the triumph of the city. Large cities as university centres have the potential to generate increased human capital, which in turn attracts more migrants with higher human capital (Faggian et al., 2017; Kooiman et al., 2018). It brings benefits for metropolitan areas, but it also contributes to the deepening of regional disparities, disadvantaging rural and peripheral regions. This trend was also observed in Slovakia (Pregi & Novotný, 2019; Novotný et al., 2023).

The region of the capital took a special position in this regard. With its relatively heterogeneous economic base, Bratislava coped relatively well with the early phase of the post-socialist transformation. Subsequently, it became the capital of independent Slovakia. In addition, its location due to the fall of the Iron Curtain and integration into the EU acquired an unprecedented development potential. Unlike the rest of the country, it also quickly connected to the main European transport corridors (Musil & Ilner, 1994; Bašovský, 1995; Korec, 1998; Novotný, 2016). In Slovakia, as in several other Central European countries formerly part of the Eastern Bloc, a significant west-east gradient thus emerged. Gorzelak (2020) attributes this to the proximity of the western regions to highly developed countries, from which the economic effects 'spill over' to the western regions of these newer EU members.

The internal transformation processes and the external factors mentioned above led to the formation of two essential economic regions in Slovakia. Generally, they can be described as the rich west and northwest and the poor south and east (cf. Halás, 2008; Fig. 1).

The Bratislava region was also the first in Slovakia, where the decentralization (also often referred to as suburbanisation of peri-urban growth) of population and economic activities (usually referred to as commercial suburbanisation but to underscore that it encompasses non-commercial economic activities as well, we prefer the term 'economic suburbanisation' henceforth) became more pronounced (Šveda & Križan, 2011; Novotný, 2016), similar to regions in other major cities in CEEC (cf. Sýkora & Ouředníček, 2007; Kabisch et al., 2010; Kurek et al., 2014; Zborowski et al., 2023). Later, these decentralization trends spread to regions of smaller towns across Slovakia (Pregi & Novotný, 2019). This makes it difficult to identify rural areas according to traditional methods (more in the Data and Methods section).

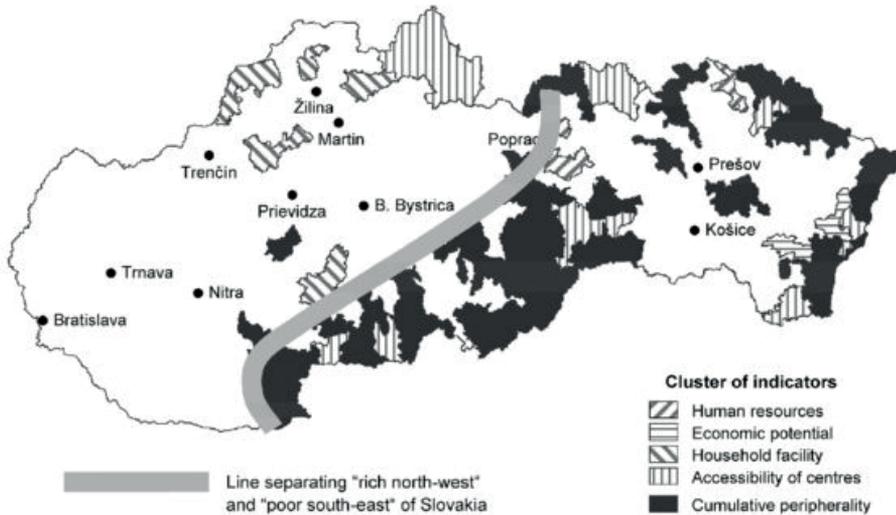


Figure 1. Regional disparities and location of peripheral regions of Slovakia according to Halás (2008)

## The economic situation of rural areas in Western and post-socialist countries

Although approaches to the definition and delimitation of rural areas are quite heterogeneous (cf. Ricketts et al., 1998; Novotný et al., 2015; Nestorová Dická et al., 2019; Nelson et al., 2021), based on common definitions rural areas occupy the vast majority of the territory and a significant part of the population of the EU (Káposzta & Nagy, 2022; EU, 2023). This also applies to Slovakia and the surrounding countries (Novotný et al., 2015). Rural areas face many serious challenges. Compared to urban areas, rural areas have a lower average income per capita, a worse qualification structure of the population, a less developed service sector and worse infrastructure (Káposzta & Nagy, 2022). Still, the economy research in rural areas is insufficient (Hruška et al., 2015). In developing rural economies, Káposzta and Nagy (2022) emphasize the role of globalisation, placing the geographical venues and distances into new dimensions. It provides rural areas both, new opportunities and threats. New markets are opening for local businesses and allowing the unique local products and services to enter the new markets. Many rural areas may be better adaptable to new economic structures than traditional industrial areas with the specially qualified labour force.

Slovakia's accession to the EU has been acknowledged as a catalyst for the transformation of its rural economy, with outcomes varying across individual regions contingent on the diverse opportunities available (Möllers et al., 2011; Bezák & Mitchley, 2014). The adoption of the Common Agricultural Policy (CAP), coupled with access to various funds and programs supporting regional development, opening doors to the single European market, and fostering diversification, introduces both opportunities and challenges for rural economies (Wrzochalska, 2014; Schiller et al., 2015; Hadyński, 2021). Scholars (Abrham, 2011; Smętkowski, 2013; Brambert & Kiniorska, 2018; Grodzicki & Jankiewicz, 2022) agree the impact of the EU membership on rural areas is diverse,

and emphasize that the long-term consequences hinge on how effectively local communities and policymakers adapt to the presented opportunities and challenges.

In addition to economic changes, rural areas are undergoing dramatic changes due to dynamic social-demographic or environmental developments and related political interventions. These changes resulted in new land use patterns and the economy's structure. The rural landscape is no longer only a place of production agriculture. It increasingly localizes activities associated with multifunctional agriculture and various new industrial, commercial, touristic and leisure activities that cause changes in rural identity and the lifestyle of rural residents (e.g. Carlin & Saupe, 1993; Dax, 1999; Floysand & Sjöholm, 2007; Mahon, 2007; Lampietti et al., 2009; Silva & Figueiredo, 2013; Hruška & Czapiewski, 2015; Chodkowska-Miszczuk et al., 2019; Kulla et al., 2022; Rudenko et al., 2022). In post-socialist countries, this shift has been occurring since the 1990s. In this manner, albeit with a time lag, they are following trends observed in Western countries. For instance, Keeble et al. (1983) noted a relative shift of the manufacturing industry from highly urbanized to rural regions during the 1970s.

In developed economies, agriculture in its production form is no longer the main element of the economic system in rural areas (Frantál & Martinát, 2013). A paradigm linking rural space with agricultural production gives way to a post-production paradigm emphasizing the necessity of economic diversification of rural areas (Ilbery & Bowler, 1998; Wilson, 2001; Beesley et al., 2003). Such diversification should be based on market-oriented, multifunctional, efficient and at the same time environmentally friendly agriculture; further large-scale investments in infrastructure and the introduction of renewable energy projects; increased emphasis on the use of natural and cultural heritage through rural tourism; raising awareness of the importance of a sustainable environment and the overall quality of life in the countryside.

Deagriculturalisation trends are not only a theoretical concept, but also a statistically confirmed trend. Copus et al. (2006) state that in the first decade after 1990, the number of employees in agriculture in Western European countries gradually decreased by more than 2% per year. Slovakia, similarly with some other post-socialist countries, followed this trend later, but at a much faster pace (Copus et al., 2006; Grodzicki & Jankiewicz, 2022). It is particularly evident in the case of Slovakia, where the NUTS 3 regions have some of the lowest employment rates in agriculture, forestry, and fishing among the post-socialist countries that are now members of the EU (Eurostat, 2023).

## Data and Methods

### Data and indicators

While there are many sources of data on economic structure and performance at national and regional scales, the research at local or lower regional scales has to tackle very limited data sources. In this study, we deal with this problem by combining several methodologically relatively consistent data from population censuses, which make it possible to estimate the number and sectoral structure of jobs in individual municipalities (LAU 2).

We employed data published as Population census results for censuses in 1991, 2001, 2011 and 2021 (SOSR, 1991, 2001a, 2011a, 2021a). These data provide details on local economically active population (EAP), i.e., the number of employed by economic sector, number of out-commuters, number of unemployed, and persons on maternal/parental leave. To make the calculations more precise, the statistical office provided us with an extract from the data from each census containing only the number of working residents (including working pensioners) by economic sector for each

municipality. More detailed data on commuting at the local level for each of the four latest population censuses were published Statistic Office of Slovak Republic (SOSR, 1994, 2001b, 2011b, 2021b).

Total number of jobs in each analysed municipality ( $J$ ) is estimated as a number of working residents of a municipality ( $W$ ) from which a number of out-commuters ( $O$ ) is subtracted and number of in-commuters ( $I$ ) added. We applied this basic equation ( $J = W - O + I$ ) analogically for each economic sector separately. The data on the economic sector of labour are relatively detailed in each census, but there are slight differences in the sector categorizations. Therefore, we aggregated the original sectors into five main sectors the way to minimize differences in the content of individual main sectors:

1. agriculture and forestry (including fishing and other activities in the primary sector excluding mining);
2. industry and construction (including mining, as it is often listed in the source data in the same category as the processing of extracted raw materials);
3. transport and communication (including postal and delivery services and travel agency services);
4. education and health care (including employees in culture in 1991 and employees in public administration in 2011 and 2021);
5. market and other services (including retail, wholesale and all remaining services).

If the 'unidentified sector' category also appeared, we proportionally divided its value among the identified categories. Nevertheless, in none of the censuses did the unidentified sector reach such a proportion that it could significantly distort the results.

It is also important to note that the data on commuting were published according to the person's place of permanent residence in the 1991, 2001 and 2011 censuses. In 2021, a person's permanent and current residence were ascertained, and data on commuting were published according to current residence. Therefore, in the calculations, unlike previous censuses where we worked with permanent residence, we used data on the sectoral structure of the population of individual municipalities ( $W$ ) according to the person's current residence. Mathematically, however, the estimate of the number of jobs in the municipality ( $J$ ) should provide consistent data, regardless of whether the entire calculation of  $J$  includes data based on permanent employment or the entire calculation is based on data on the current residence of the working person.

The jobs that were identified in the municipalities include sole traders (proprietorships) who are registered in the municipality, but may perform the work elsewhere. There may be analogically some sole traders working in municipalities but not being counted in the statistics, as it does not record their real place of work. This fact may also affect overall results, but it is not possible to get more properly adjusted information due to the character of available statistical data. In the records, there is also a certain disproportion between those commuting abroad, who are accurately recorded in the census, and those commuting from abroad, who are often not recorded. As the number of commuters from abroad continues to grow, we statistically identify fewer jobs in each new census than actually exist. Although these are not significant numbers, this fact must be taken into account when interpreting the results. Still, when we compare the cumulative structure for the whole of Slovakia, our results correspond to the results of the EU Labor Force Survey (cf. CEDEFOP, 2023). Hence, our methodology can lead to minor deviations in the number of jobs in specific municipalities, but the results provide a relatively reliable depiction of the sectoral structure of jobs. The aim of the study is not to provide precise figures for individual municipalities, but rather to capture development trends in categories of municipalities or in the regions to which municipalities are aggregated. In this context, the input data can be considered sufficiently reliable, and the results derived from them sufficiently accurate.

To make a structure of jobs in spatial units of different sizes comparable, we express it as percentage. In order to capture the development trends in the intercensal periods, we express changes in the number of jobs overall or in individual sectors in the form of a growth index.

At the level of individual municipalities, we also assess the correlation between the changes in the number of economically active residents (*EAR*) and the number of jobs (*J*). Based on their percentage change, we categorize municipalities into four categories, for two different approaches to the definition of rural municipalities.

For evaluation at regional level, the input data were aggregated from the level of municipalities into the regional units. Subsequently analogous indicators and calculations were applied as at the local level.

### Spatial frame and identification of rural space

The basic spatial unit of the study, both for the input data and the interpretation of the results, is the municipality (LAU 2). In order to evaluate the spatial differentiation also at the regional level and to be able to assess the development of the number and structure of jobs also with regard to the regional level of economic development, we also used NUTS 3 (Fig. 2).

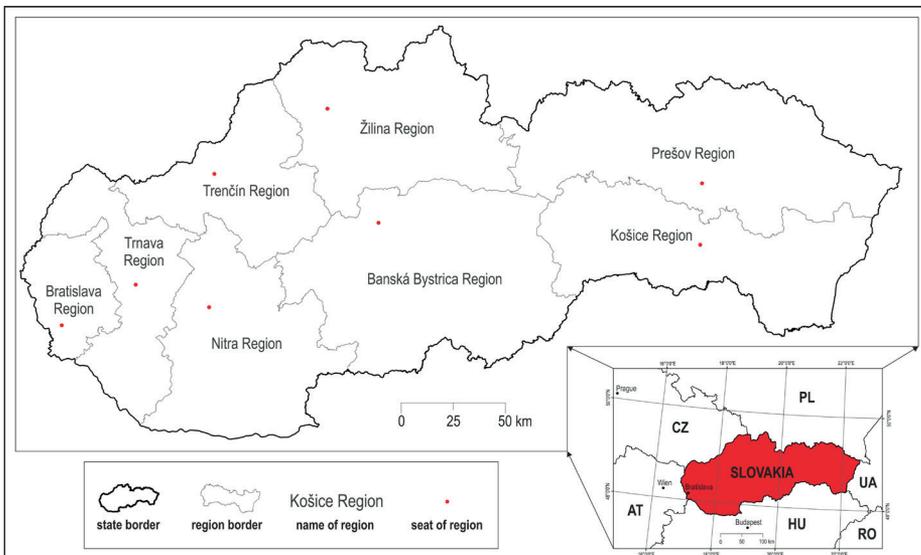


Figure 2. NUTS 3 regions and location of Slovakia within Central Europe

There are numerous methods for identifying rural areas (Ricketts et al., 1998; Novotný et al., 2015; Nestorová Dická et al., 2019; Nelson et al., 2021). Moreover, delineating rural, non-rural, or urban areas in Slovakia and CEEC is challenging due to the obsolescence of approaches from the socialist era, which reflected conditions of socialist industrialization and urbanization. These approaches lost relevance in the transformation period characterized by intense suburbanization and the redistribution of economic activities (Nestorová Dická et al., 2019; Novotný et al., 2015; Novotný et al., 2016).

In this study, we therefore decided to evaluate and compare the results in rural municipalities identified in two different ways. Basic features for each category provides Table 1.

1. In Slovakia, a dichotomous approach is used from an administrative point of view – a municipality is considered rural if it has not been granted a status of a town. To obtain such status, a municipality should meet several criteria, especially the number of inhabitants (at least 5,000) and amenities, and the citizens should decide in a valid referendum that they want their municipality to become a town. However, the final decision on granting the status of a town makes the national parliament, and fulfilment of the mentioned criteria is not a necessary condition. This is also why several municipalities in Slovakia have the status of a town, even though some have fewer than 5,000 inhabitants, and in two cases, not even 2,000. More about the issue of granting the status of a town in Slovakia is provided by Novotný et al. (2016) in terms of historical development and Novotný et al. (2015) compared to surrounding countries. Although this approach brings certain risks from a geographical point of view, it is often used in various scientific or analytical works. Therefore, even in this study, in the first approach, we consider as rural municipalities all municipalities that were not granted the status of a town at the time of the census in 2001. The following text will also refer to this group of municipalities as ‘administratively rural’.
2. Nestorová Dická et al. (2019) abandoned the dichotomous approach to rural identification, and instead focused on the entire spectrum of specific features of rurality. Based on them, they proposed a rurality index to identify the categories of rural and non-rural municipalities and several subcategories. The rurality index reflects the variability of population density, land use patterns, access to amenities, and traffic accessibility. The higher rurality index suggests that an area is more rural, with lower population density, larger expanses of undeveloped land, and limited access to urban amenities. In our study, we take over the category of extremely rural municipalities, i.e. municipalities that achieved the highest values of the rurality index. In the following text, we will also refer to this group of municipalities as ‘extreme rural’.

**Table 1.** Basic features of chosen categories of rural areas

Type of area	1991	2001	2011	2021
<b>Administrative rural</b>				
number of municipalities	2,671	2,744	2,752	2,749
population	2,280,000	2,360,000	2,460,000	2,420,000
economically active residents	1,080,000	1,160,000	1,170,000	1,230,000
<b>Extreme rural</b>				
number of municipalities	744	764	764	764
population	300,000	275,000	262,000	229,000
economically active residents	132,000	125,000	120,000	113,000
<b>Slovakia</b>				
number of municipalities	2,825	2,883	2,890	2,890
population	5,274,000	5,379,000	5,397,000	5,499,000
economically active residents	2,618,000	2,781,000	2,630,000	2,750,000

Source: own elaboration based on data from the SOSR (1991, 2001a, 2011a, 2021a).

## Results and discussion

### Number and distribution of jobs

There was a significant spatial redistribution of jobs between 1991 and 2021 at the level of individual municipalities, accompanied by a decrease in the number of jobs in majority of municipalities across the whole country (Fig. 3). With the exception of Bratislava and a few smaller towns in its wider surroundings, mainly towns and larger rural communities recorded declines. However, the spatial pattern is also obvious, that in the mountainous central and northern parts of Slovakia, especially in the vicinity of larger towns, many municipalities experienced significant growth. These are primarily small villages that were not designated as central villages during the socialist period, resulting in very limited economic activities there. With the abolition of development restrictions of rural non-central municipalities after 1989, at least basic services could appear in these municipalities either on a commercial basis or directly by the municipality as an employer. However, among the municipalities with a higher number of jobs growth index, there are also medium-sized and even large rural municipalities with a larger economic base. These are mostly municipalities located in the proximity of larger towns. This indicates economic suburbanization, which is consistent with the idea of a more successful transformation of the rural areas in metropolitan regions (cf. Maryáš et al., 2014; Lovell et al., 2018; Twardzik & Heffner, 2019).

The south of Slovakia shows the opposite trend. Except for the wider surroundings of the largest cities (Bratislava, Košice), from the south-west to the south-east of Slovakia there is an area where there are practically no municipalities with an increase in the number of jobs. This can be related primarily to two factors. First, it is a fertile lowland area in which agriculture had an above-average presence during the socialist period (Baláž, 2004; Némethová & Jaďudová, 2018). This was characterized by a high rate of overemployment, and new economic activities in the post-socialist period did not compensate for the drop in employment in agriculture. The underdeveloped transport infrastructure also contributed to this, discouraging potential investors (cf. Dudáš & Grančay, 2019; Beňová & Brocková, 2022). Secondly, within Slovakia, this is one of the areas with the most aging population. South-western Slovakia was the first region in Slovakia recording natural population decline already in the 1980s (Mládek, 2006; Bleha et al., 2014). The decreasing number of jobs here reflects the decreasing number of economically active residents. Even smaller regions in the north-west and north-east of Slovakia, which have a more elderly population, show only a minimum number of municipalities with an increase in the number of jobs. Hence, it is intriguing to delve deeper into these results, considering the chronological development, the relationship between the *EAR* and the number of jobs, and the evolution of the sectoral structure of jobs.

Between the first two censuses after the fall of socialism, an overall decrease in the number of jobs is evident. This corresponds to the reduction of overemployment, especially in industrial and agricultural sectors, while creation of new jobs was not sufficient to offset the losses (cf. Némethová & Jaďudová, 2018). This is also documented by the unemployment rate, which rose from 6.6% in 1991 to almost 20% in 2001. None of the larger cities significantly increased the number of jobs. On the contrary, several small towns and rural municipalities recorded an increase. Almost all of them were located in the proximity of larger towns indicating a tendency towards decentralization of economic activities (Fig. 4).

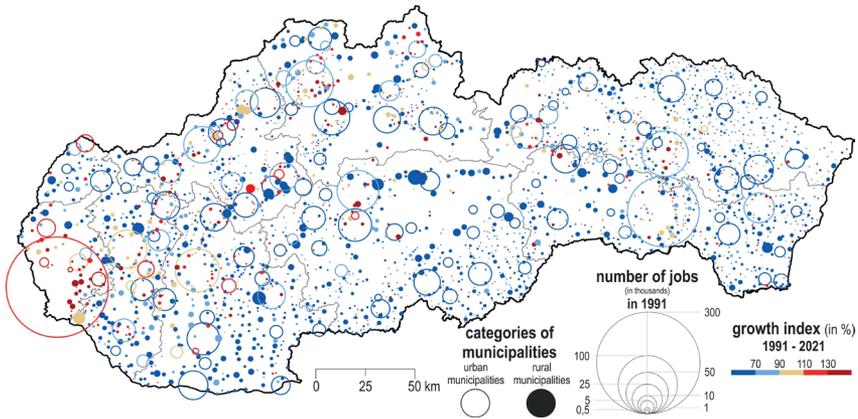
The fundamental economic reforms implemented at the turn of the millennium catalyzed rapid economic growth between 2001 and 2011 (Grančay & Grančay 2017), which also spurred a revival in job growth. All larger towns stabilized the number of jobs, and growth was concentrated in smaller

towns and villages evenly distributed across Slovakia. A greater concentration of municipalities with a decrease in the number of jobs was in the southern part of central Slovakia (south of the Banská Bystrica region), around the border between the Banská Bystrica and Košice regions and in the easternmost part of Slovakia (Fig. 5). These areas were among the most underdeveloped regions in Slovakia (Korec, 2005). Their challenges stem from various factors, including proximity to underdeveloped regions in neighboring countries, inadequate infrastructure, imbalanced age or educational demographics within the population, and problematic economic specialization (Korec & Polonyová, 2011).

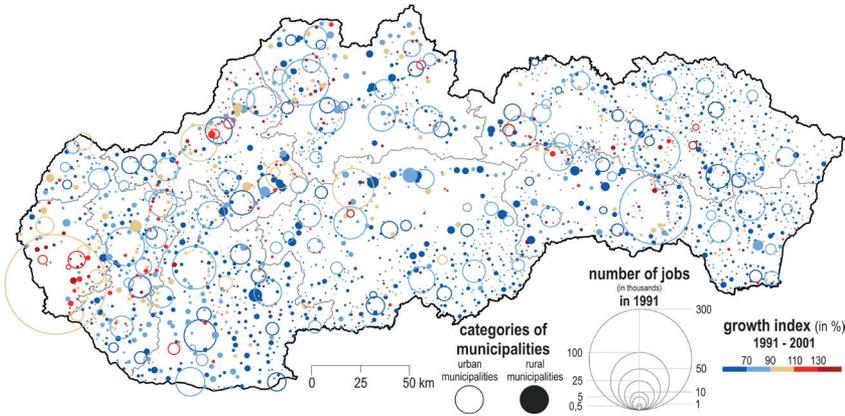
The results for individual municipalities during the last inter-census period might have been influenced by the rising trend of cross-border commuting and the influx of foreign workers (cf. Beňová & Brocková, 2022). However, the spatial relationships are still evident. With the slowdown in economic growth in the second decade of the new millennium, there was also a slowdown in the number of jobs in most municipalities. The increase in jobs is concentrated in Bratislava and its surroundings, but it is also observed in many municipalities in proximity of larger towns throughout Slovakia. The exceptions are a large part of southern Slovakia and the easternmost regions (Fig. 6). This spatially correlates with distribution of the least economically developed districts across Slovakia (EI, 2023).

In the category of administratively rural municipalities, a dominant decrease in the number of jobs is evident. Statistically, this applies to more than 70% of municipalities (Fig. 7). However, we emphasize again that the methodology captures a slightly smaller number of jobs with each new census, and thus the actual share of municipalities with a decrease in the number of jobs is smaller than the graph shows. However, the relationship to the number of *EAR* is more important than the exact values of shares. While most municipalities show a decrease in the number of jobs, they also show an increase in the *EAR*. This confirms the growing disproportion between the place of work and the place of residence. This corresponds to trends from other countries, while in the post-socialist space they began to take place late, but more intensively (Forrest, 1996; Nielsen & Hovgesen, 2006). Nevertheless, in the southern and eastern regions of Slovakia, Michniak (2016) also identified areas where the volume of commuting to work decreased between 2001 and 2011, attributable to economic deterioration. However, this occurred during a period when the overall unemployment rate in Slovakia was declining. Hence, we posit that the general decrease in the number of *EAR* in regions and municipalities with aging populations and emigration conditioned this trend. Municipalities experiencing declines in the numbers of both inhabitants and jobs constituted 40% of all administratively rural municipalities (Fig. 7).

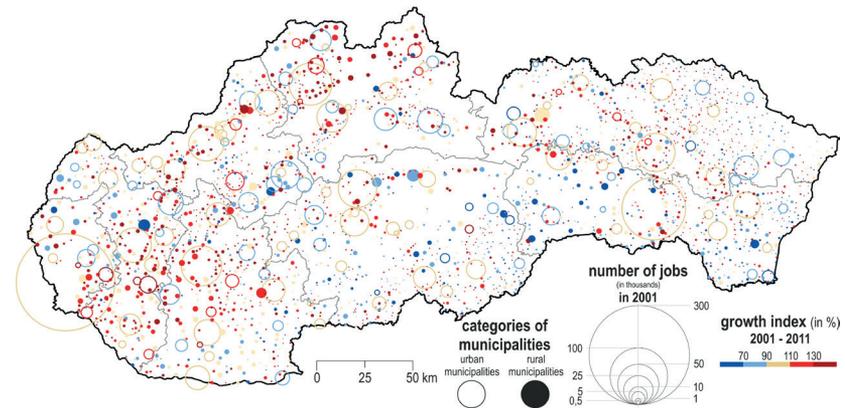
Most municipalities show slight changes in both parameters. However, several municipalities for the period 1991-2021 recorded a change of hundreds to thousands of %. These municipalities represent extreme examples of development patterns that, to a lesser extent, characterize a much larger sample of municipalities. These municipalities are scattered throughout Slovakia, with a common feature being their proximity to a city or larger town (Fig. 7). The only exception is Matovce, which lies in a rural peripheral region in the north-east of Slovakia, near the town of Svidník, which barely has ten thousand inhabitants. Matovce, with just over a hundred inhabitants, has been suffering from a long-term population decline, which is also reflected in a slight decrease in the number of *EAR*. It is a municipality that had almost no economic base during the socialist period. Therefore, creating a few jobs or self-employed people is enough for the municipality to formally report an increase. Statistically high values of the increase or decrease of jobs occur in many municipalities with a small population or economic base.



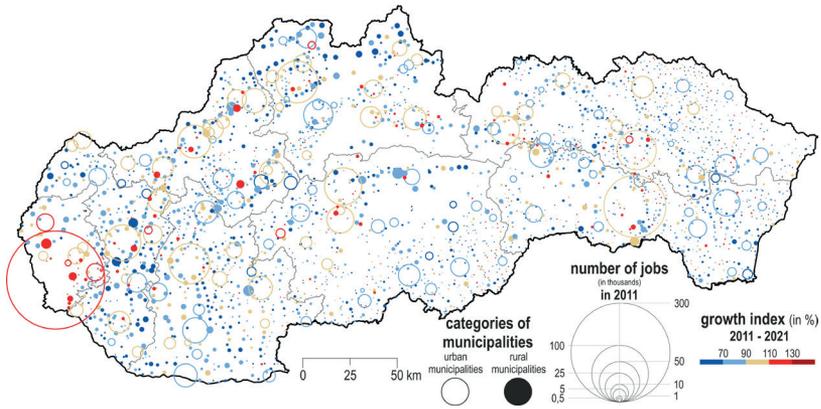
**Figure 3.** Development of the number of jobs ( $J$ ) in the municipalities of Slovakia between 1991 and 2021  
Source: own elaboration based on data from the SOSR (1991, 1994, 2021a, 2021b).



**Figure 4.** Development of the number of jobs ( $J$ ) in the municipalities of Slovakia between 1991 and 2001  
Source: own elaboration based on data from the SOSR (1991, 1994, 2001a, 2001b).

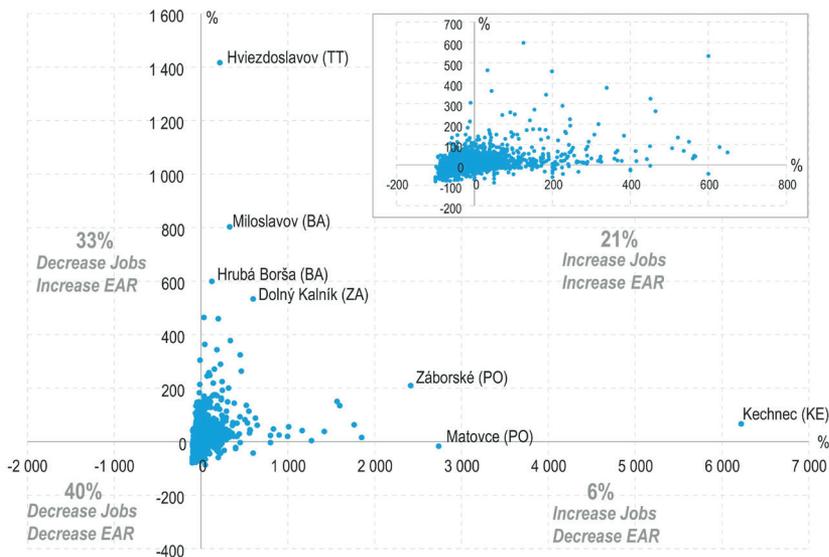


**Figure 5.** Development of the number of jobs ( $J$ ) in the municipalities of Slovakia between 2001 and 2011  
Source: own elaboration based on data from the SOSR (2001a, 2001b, 2011a, 2011b).



**Figure 6.** Development of the number of jobs ( $J$ ) in the municipalities of Slovakia between 2011 and 2021  
 Source: own elaboration based on data from the SOSR (2011a, 2011b, 2021a, 2021b).

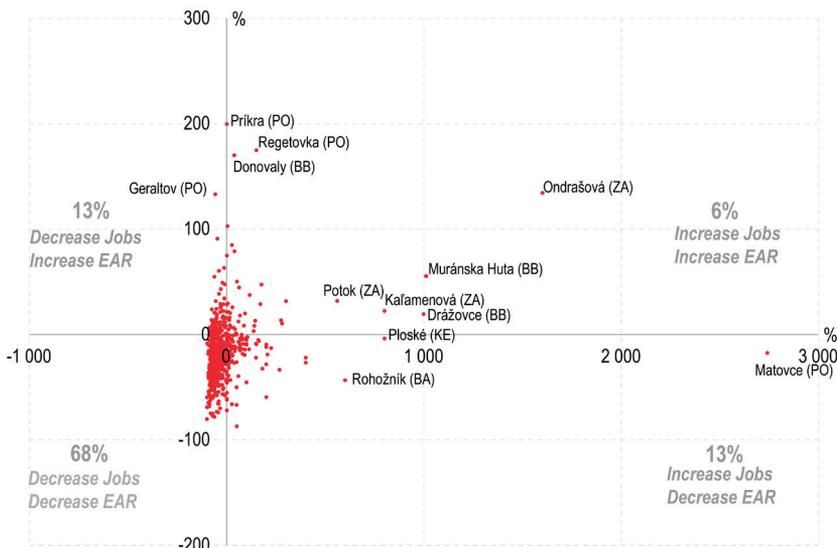
Another pattern is represented by municipalities with an extremely high increase in the number of the *EAR*, behind which the increase in the number of jobs lags significantly. The most typical examples are suburban municipalities of Bratislava (Hviezdoslavov, Miloslavov, Hrubá Borša), but such a pattern also occurs to a lesser extent in suburban municipalities of other towns. Moreover, in almost 100 municipalities, a statistically significant growth (at least 50%) in the number of *EAR* was accompanied by a decrease in the number of jobs.



**Figure 7.** The relationship between the development of the number of jobs ( $J$ ) and economically active residents (*EAR*) in administratively rural municipalities of Slovakia between 1991 and 2021 (Abbreviations of the names of regions listed after the names of municipalities: BA – Bratislava Region, TT – Trnava region, ZA – Žilina Region, PO – Prešov Region, KE – Košice Region)  
 Source: own elaboration based on data from the SOSR (1991, 1994, 2021a, 2021b).

The opposite pattern is represented by rural municipalities where large industrial parks with hundreds, often even thousands of new jobs were created (Záborské near Prešov, Kechneč near Košice), but the growth rate of the number of economically active residents is negligible compared to the number of jobs. An interesting phenomenon occurs here, when the traditional direction of commuting from rural to urban areas shifts in favour of rural municipalities. Many similar cases of such municipalities were observed but their spatial distribution is limited to immediate vicinity of large towns. There are almost 200 administratively rural municipalities (7% of all municipalities) where a decrease in *EAR* accompanied the growth in the number of jobs.

No more favourable trends can be observed even in the category of 'extreme rural' municipalities. Approximately 80% of all municipalities in this category experience a decrease in the number of jobs or *EAR*. Two-thirds of all municipalities record a decrease in both indicators (Fig. 8).



**Figure 8.** The relationship between the development of the number of jobs (*J*) and economically active residents (*EAR*) in extreme rural municipalities between 1991 and 2021

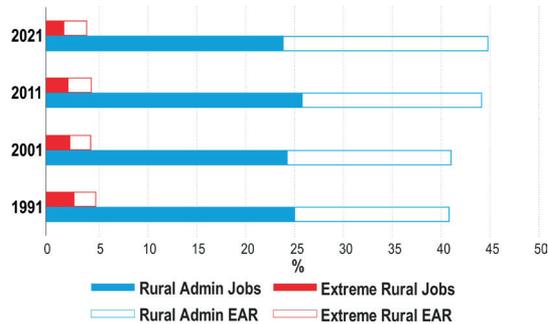
(Abbreviations of the names of regions listed after the names of municipalities: BB – Banská Bystrica Region, BA – Bratislava Region, ZA – Žilina Region, PO – Prešov Region, KE – Košice Region)

Source: own elaboration based on data from the SOSR (1991, 1994, 2021a, 2021b)

This development is also strongly correlated with the development of migration trends in Slovakia. Novotný (2019) suggests that rural regions have substantial development potential due to lower building density, available land, and lower prices, but this potential depends on proximity and accessibility to large urban centres.

While the number of *EAR* in majority of administratively rural municipalities is growing, the number of jobs in it is stabilized (Fig. 9). Almost half of all *EAR* live in these municipalities, but only less than a quarter of all jobs in Slovakia are located in them. This almost exactly corresponds to the values in Poland, where over 40% of the population lives in rural areas, but less than a quarter of all business entities operate there (Bański, 2017; Twardzik & Heffner, 2019). Twardzik & Heffner (2019) emphasize the need for rural multifunctionality, but similar to Maryáš et al. (2014) or Lovell et al. (2018) observe that non-agricultural economic activities are significantly developing only in rural areas near cities, while peripheral areas lag behind. This is apparently

also the case of Slovakia, because the numbers of jobs in extremely rural municipalities have been continuously decreasing. In addition, it was accompanied by a decrease in the number of *EAR*.

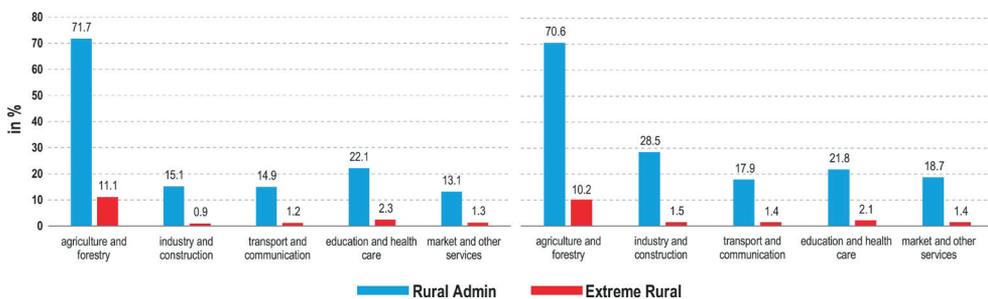


**Figure 9.** Percentage of economically active residents (*EAR*) and jobs (*J*) in selected categories of rural areas compared to their total numbers in Slovakia in the censuses of 1991, 2001, 2011, and 2021.

Source: own elaboration based on data from the SOSR (1991, 1994, 2001a, 2001b, 2011a, 2011b, 2021a, 2021b).

### Sectoral structure of jobs

The category of administratively rural municipalities accounted for approximately 40% of the total number of *EAR* in Slovakia in 1991 and 45% in 2021. Additionally, they represented about 25% of the total number of jobs (Fig. 9). However, almost 70% of all jobs in agriculture and forestry were located in this category of municipalities, both at the beginning and at the end of the monitored period (Fig. 10). A highly disproportionate representation of agriculture and forestry is also observed in the category of extremely rural municipalities (cf. Fig. 9, Fig. 10). This sector thus remains significantly concentrated in rural areas.



**Figure 10.** The share of jobs (*J*) in economic sectors in rural areas from the total number in the respective sectors in Slovakia in 1991 (left) and 2021 (right)

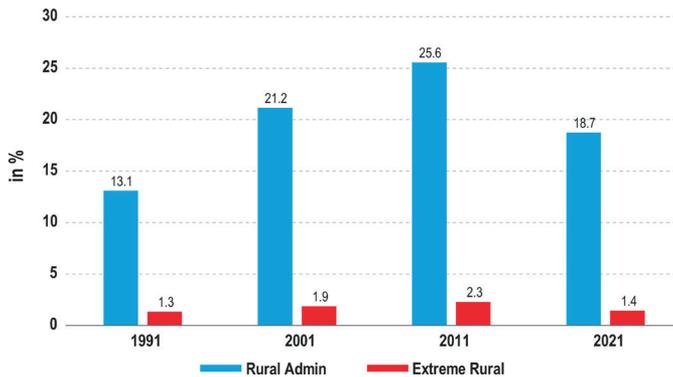
Source: own elaboration based on data from the SOSR (1991, 1994, 2001a, 2001b, 2011a, 2011b, 2021a, 2021b).

The percentage of jobs in the sector of industry and construction in administratively rural municipalities recorded a rapid increase from 15 to 30% during the 1991-2021 period. However, the increase was much smaller in extremely rural municipalities. This indicates that, to a much greater extent than the development of industry and construction in traditional agricultural rural areas, the growth of this sector is driven by suburban areas, where also many industrial parks and logis-

tics centres were established (cf. Repaská et al., 2016; Kopecká et al., 2019; Korec & Popjaková, 2019). This is a similar trend as in neighbouring countries (Sýkora & Ouředníček, 2007; Kurek et al., 2014; Kubeš & Ouředníček, 2022). However, changes in land use indicate that the process of industrialization also affects small and peripheral rural municipalities, albeit to a limited extent (Druga & Rusinko, 2023). Establishment of the logistics centres could also be a reason why the proportion of jobs in the transport and communication sector in rural areas recorded increase (Fig. 10).

A relatively stabilized share of the number of jobs recorded the education and health care sector, but an increase was recorded in the market and other services sector. This increase also primarily concerns administratively rural municipalities (Fig. 10). However, the dynamics of development in this sector during the monitored period (Fig. 11) are interesting. The percentage of jobs in this sector peaked at the 2011 census, when it reached more than 25% in administratively rural municipalities. A smaller, but statistically significant increase was also recorded in extremely rural municipalities. The decline observed in the 2021 census may indicate a much greater vulnerability of rural commercial services to external factors such as the Covid-19 pandemic and related measures and the economic crisis (cf. De Luca et al., 2020). Nevertheless, to draw such a definitive conclusion, a more thorough examination of this phenomenon within a broader context would be necessary.

Interesting patterns also appear at the regional level. Figure 12 shows that in most regions in Slovakia, the number of jobs in administratively rural municipalities decreased between 1991 and 2021. Even here, however, it should be noted that the actual number of jobs in 2021 was higher because our methodology only captures jobs occupied by foreigners to a limited extent. However, this should not affect the basic spatial image. The only region with a statistically significant increase in the number of jobs is the Bratislava Region. In Slovakia's more developed western and north-western parts (cf. Fig. 1), there are regions without significant changes. The opposite situation is in the east and south of the country where many areas are featured by accumulated peripherality.



**Figure 11.** The share of jobs (*J*) in the market and other services sector in rural areas from the total number of jobs in this sector in Slovakia in the 1991, 2001, 2011 and 2021 censuses

Source: own elaboration based on data from the SOSR (1991, 1994, 2001a, 2001b, 2011a, 2011b, 2021a, 2021b).

In 1991, the share of agriculture and forestry in Slovakia's total number of jobs was almost 15%. In 2021 it was less than 2.5% (cf. Valev et al., 2023). This was also reflected in the representation of this sector in individual regions. In 1991, except for the Trenčín Region, the most jobs in rural municipalities in every NUTS 3 were in agriculture and forestry. This sector had a dominant position in employment in rural municipalities in the Nitra, Prešov and Trnava Regions, where it accounted for 48% to 57%

of all jobs. In 2021, every region recorded a decrease in employment in agriculture. The highest decrease was in Nitra (decrease of 47.6 pp) and Prešov Regions (43.6 pp). However, these two regions still retain the most jobs in this sector. In addition, the regions in the south of Slovakia (Banská Bystrica and Trnava Regions also have a relatively high representation (8%). Thus rural areas have remained a stronghold of agriculture. However, agriculture itself is much less significant in terms of employment than it was at the beginning of the post-socialist transformation period.

As a result of socialist industrialization, industry and construction became the most important sector of the national economy (cf. Kunc et al., 2023) even when employment concerned. This was still evident in 1991, when the share of jobs in this sector represented 43.5% of all jobs. Currently, Slovakia is among the countries with the highest share of employment in the industrial sector worldwide (cf. Trading Economics, 2023b), although its share fell to less than 30%.

In 1991, up to 26% of all jobs in the rural municipalities of Slovakia were in industry and construction. This indicates that socialist industrialization also affected some rural regions. The highest employment in the rural municipalities of Slovakia was in the Trenčín Region (37%, i.e., 2.7 pp. more than in agriculture and forestry) followed by the Banská Bystrica Region (36.3%).

Despite the transition to a post-industrial economy, the share of industrial jobs has increased in every region of Slovakia. It indicates increasing position of the industrial sector in rural Slovakia and the transition from agricultural to multifunctional countryside (cf. Holmes, 2008; Czarnecki et al., 2023). This corresponds to trends identified in other studies in Slovakia and in neighbouring countries (Frantál & Martinát, 2013; Hruška & Czapiewski, 2015; Chodkowska-Miszczuk et al., 2019). The largest shares of industrial jobs reach rural municipalities in north-western Slovakia – in the Trenčín and Žilina Regions (fig. 12), where this sector played a significant role already at the beginning of the monitored period (Mládek, 1990). However, the Nitra and Prešov Regions, which exhibited characteristics of traditional agricultural regions in 1991, recorded the most significant increase in the proportion of jobs within the industrial sector. These regions previously had the highest proportions of agricultural jobs and the lowest proportions of industrial jobs.

The largest decrease in the number of jobs (but not in the share) in the industrial sector was recorded in the Banská Bystrica and Košice Regions (15,000 and 6,000 jobs respectively). Among other factors, the concentration of areas with traditional mining sector (cf. Bleha & Buček, 2023), which was often converted into industrial sectors including heavy industry, contributed to the relatively high numbers of industrial jobs in these regions in 1991. However, poor transport accessibility and a general decline in heavy engineering caused a decline in the number of jobs in the sector.

All regions saw an increase in the share of jobs in the transport and communications sector but its proportion remained small compared to other sectors. The highest increase was recorded in regions in western Slovakia, which is the most economically developed and has the best transport infrastructure.

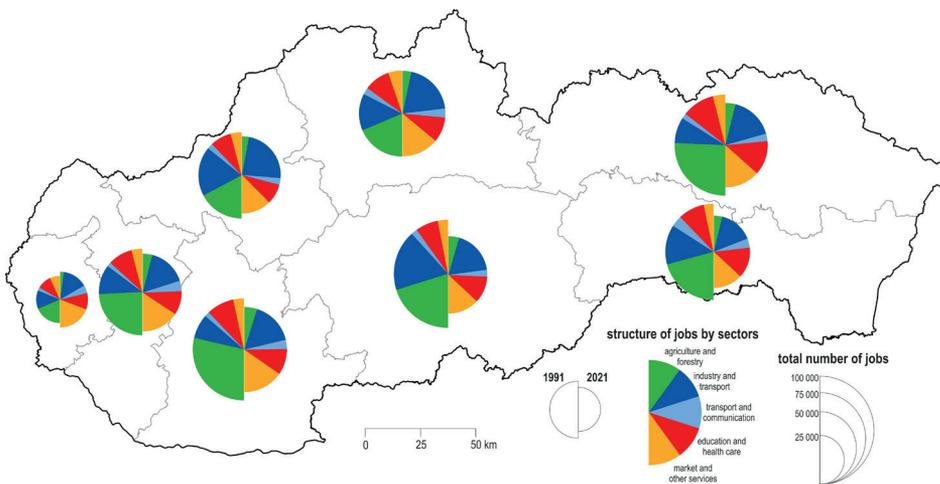
Public services in rural municipalities are presented mainly by public administration and education. The most job positions in this sector in 1991 were in the regions with the highest proportion of rural municipalities, i.e. in the Prešov, Nitra, Košice and Banská Bystrica Regions. From 1991 to 2021, the share of jobs in this sector in Slovakia rose slightly from less than 20% to more than 23%, but the total number of jobs decreased by more than 7,500. The decrease can also be explained by the decrease in the number of primary schools and the number of teachers after 1991 (Lauko et al., 2010). Except for the Bratislava Region, the number of jobs decreased in every region, but the share of jobs increased significantly in the Banská Bystrica, Prešov and Košice Regions. One possible explanation may be that precisely in these regions, there is the largest concentration of municipalities with segregated and marginalized Roma populations (MV SR, 2019). This population is characterized

by intensive natural reproduction, resulting in a growing number of school-age children (Nestorová Dická, 2021). As a result, unlike in other municipalities, there is increased demand for school facilities, paediatricians, and other public services.

At the beginning of the post-socialist transformation in 1991, the share of jobs in market and other services was less than 15%. From a sector playing a minor role in the structure of jobs, it became one of the most important by 2021. In the Bratislava Region, it constituted the largest proportion (38.5%) of all sectors. Unlike public services, the proportion of this sector decreases eastwards, towards the economically underdeveloped regions in central-south and eastern Slovakia.

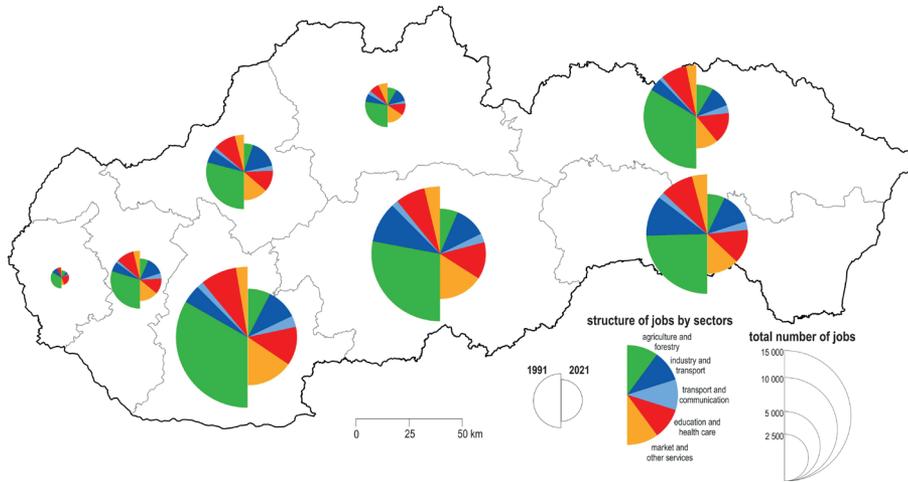
In the case of extreme rural municipalities (Fig. 13), a much greater decrease in the number of jobs in all NUTS 3 in Slovakia is evident compared to administrative rural municipalities. At the same time, there is a much larger share of jobs in agriculture and forestry in 1991 and 2021. In all regions except the Košice Region, it even had more than a 50% share in 1991. Nevertheless, the sector experienced a significant drop in employment in extreme rural municipalities in all regions. The highest share was retained in the Nitra Region and, surprisingly, also in the Bratislava Region. However, in the latter case, it should be noted that it is a region with minimal representation of extreme rural municipalities. Although the other sectors showed an increase in share, this is rather the result of a smaller decrease in the number of jobs than in the case of agriculture and forestry.

Since this category mostly excludes municipalities in the suburban zones of larger cities, the comparison with administrative rural areas indicates that the creation of new jobs and changes in their sectoral structure are mainly driven by suburban areas, with the exception of the general trend of declining employment in agriculture. It corresponds to the idea of a more successful transformation of rural areas in metropolitan regions in the proximity of cities on the one hand (cf. Maryáš et al., 2014; Lovell et al., 2018; Twardzik & Heffner, 2019), but persisting underdevelopment of more peripheral rural regions which suffer more from the decline in the number of jobs on the other hand.



**Figure 12.** Number and sectoral structure of jobs ( $J$ ) in administratively rural municipalities in regions of Slovakia in 1991 and 2021

Source: own elaboration based on data from the SOSR (1991, 1994, 2021a, 2021b).



**Figure 13.** Number and sectoral structure of jobs ( $J$ ) in extremely rural municipalities in regions of Slovakia in 1991 and 2021

Source: own elaboration based on data from the SOSR (1991, 1994, 2021a, 2021b).

## Conclusion

The most frequently applied dichotomous approach to defining the countryside, where all municipalities without the status of a town are considered rural, presents a statistically positive depiction of changes in the number of jobs and their sectoral structure. After 1991, there was a decrease in the number of jobs throughout Slovakia, but in the following decades, the number of rural municipalities that recorded growth in the number of jobs increased. However, with a more complex concept of the countryside, considering extreme rural municipalities (Nestorová Dická et al., 2019), the share of municipalities with an increase in the number of jobs is minimal. Municipalities experiencing a decrease in the number of jobs accompanied by a decrease in the number of economically active residents dominate in this category. This suggests that economic changes in rural municipalities are strongly influenced by how we define their rurality. Rural communities with different characteristics may undergo different changes. This justifies the notion of the EU Rural Vision (EU, 2023) that development strategies should focus on rural areas according to their individual characteristics and in relation to their environment, with particular emphasis on remote and less developed rural areas.

It appears that rurality can be an opportunity but also a barrier to development, and economic success largely depends on external factors such as the accessibility of the region, its location in relation to large cities or on major transport corridors. During the monitored period, many municipalities without the status of a town experienced an increase in the number of jobs and their diversification from the primary sector to the secondary and tertiary sectors. However, this trend applies almost exclusively to municipalities in close proximity to cities and large towns. Therefore, in the sample of municipalities allocated based on the rurality index, the growth of the number of jobs is rather exceptional, and the changes in sectoral structure of jobs results from various intensity of decline in the number of jobs in individual sectors.

From the point of view of the transition to a post-industrial economy, increasing role of public and commercial services was observed. The public services (the education and health care sector, which also includes culture and public administration) gained more important role in economically underdeveloped regions and in both approaches to definition of rural municipalities. In contrary, commercial services gained more important role in more economically developed regions of western and north-western Slovakia. This indicates that the state and public administration can ensure the functioning of public services even in rural areas where commercial services are declining. This fact can be seen as a development opportunity for these regions. Still, the long-term sustainability of this situation is questionable because, with the shrinking population of these regions, the number of people who will use these public services will also decrease.

## **Acknowledgement**

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## **Konrad's imprint: immortal optimism and positivism**

Invited by a colleague from Czechia, in 2014, our young team of human geographers from Košice became part of a research consortium in a Visegrad Fund project. At the kick off meeting in Budapest, we hardly knew anyone from the consortium, and we certainly had more concerns than experience. However, after the discussion, one person addressed us and with a great deal of positivity, boosted our confidence. Based on that, we agreed to take responsibility for certain research areas within the project. That person was Konrad, and at that time, we didn't yet know that the agreed-upon research areas would become a kind of intersection of research activities that still unite our team today.

Positive attitudes turned into friendships after further meetings. Even in the workplace in Warsaw, Konrad was surrounded by people with whom we got along both personally and professionally. Whenever we collaborated, it was in a positive atmosphere and with trust. Thanks to Konrad, we became involved in the authorship teams of several valuable publications.

It's hard to say whether it was because of my knowledge of Polish or simply some interpersonal chemistry, but during my visits to Warsaw, I felt like I became part of his family. I'll never forget how I tried to cook traditional Slovak dish at Konrad's home or read Slovak fairy tales in Polish in the classroom of his beloved son Łukasz.

Later, the pandemic arrived, and our planned activities and meetings were postponed. We didn't meet again until the IGU congress in Paris in the summer of 2022. Meanwhile, Konrad experienced difficult times in his personal life, but it didn't change his charisma and positivity. We briefly left the conference venue to have an undisturbed talk about life, work plans, and visions. We agreed on a joint project, a meeting in Warsaw, and the participation of Konrad's team in a conference organized by our Institute of Geography in Košice. Konrad talked about the journeys that await him and how much he is looking forward to Mexico. Finally, we took a photo (below) as a greeting for colleagues from Warsaw and Košice.



**Figure 14.** Paris, Jardin du Luxembourg: Photo greeting for colleagues from Košice and Warsaw  
(Photo: L. Novotný)

We unfortunately won't carry out our meetings and plans anymore. Konrad's death has deeply affected us and still hurts a lot. It's hard to even accept it. However, Konrad remains with us. His incredibly positive attitude, the optimism that spread around him like a virus, as well as the research topics, friendships, and visions he brought us, continue. And so does our friendship. We know you are still with us, Konrad.

Ladislav Novotný, on behalf of colleagues Marián Kulla, Peter Spišiak, Janetta Nestorová Dická, Stela Csachová and Loránt Pregi

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