

# THE URBAN/RURAL COMMUNITY DIVIDE BASED ON A GEO-ECONOMIC PERSPECTIVE: AN ANALYSIS OF WORK CONTRACTS IN SLOVAKIA

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**ABSTRACT:** The study analyses over 1.5 million entries from the Slovak Social Insurance Company dataset for 2022. The records of work contracts for insured individuals are categorised by age, type of insurance, place of residence, and workplace, based on ZIP codes. By using ZIP codes, we were able to assess the connectivity of rural areas to workplaces, with a particular focus on the rural-urban divide. This approach highlights a geo-economic perspective in distinguishing urban and rural areas. Our analysis has revealed that most rural residents maintain strong urban economic connections, even extending to the capital city. Economically, only 26.6% of rural ZIP codes have more than 50% of their work contracts based within rural areas. Thus, we conclude that the term 'rural' carries more aesthetic than economic significance.

**KEYWORDS:** urban versus rural community, geo-economic perspective, place of residence, workplace, Slovakia

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## Introduction

The current understanding of the concept of 'rural' raises questions about the progress in human geography, particularly regarding our ability to adapt knowledge to reflect broader societal changes. As one of the oldest geographical concepts still widely used, 'rural' stands in stark contrast to the significant changes that society has undergone over the past century and, especially, in recent decades (Dymitrow 2019). Cities

worldwide are expanding at an unprecedented rate, presenting substantial challenges for national and local governments (Marans 2015, Kühne 2016). Prior to the COVID-19 pandemic, global development trends indicated a continuation of mass urbanisation, with 55% of the world's population living in urban areas, a figure projected to rise to 68% by 2050 (UN, 2020). Rural-urban migration and commuting are both contributing factors to this global urban growth.

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The willingness of Slovaks to commute to and from work has increased since 2011. With an average commuting time of four hours per week, or approximately 34 minutes per day, the Slovak Republic ranks among the countries with the lowest commuting time costs, comparable to nations like Spain, Sweden, and Finland. However, commuting still occupies a significant portion of the day for many working Slovaks (Mazúrová et al. 2021). The COVID-19 pandemic has popularised remote work, potentially reducing the traditional five-day work commute to 3–4 days per week (Ipsen et al. 2021). Commuting is more about the time spent rather than the distance travelled (in kilometres). The 'tyranny of distance' and the remoteness of smaller municipalities often lead to travel times exceeding two hours in one direction in various regions of Slovakia (Székely, Novotný 2022). Consequently, the shift towards home office arrangements could significantly alter preferences regarding housing, employment, and migration, potentially increasing the appeal of living in rural areas and affecting the desired density of municipalities and their surrounding commuter zones. Dijkstra and Poelman (2008) integrated a classification of remoteness based on driving time to the nearest city with the OECD's classification of regions into predominantly urban, intermediate, and predominantly rural areas. However, they did not consider the economic interactions between urban and rural locales. This paper explores labour mobility in Slovakia, particularly focusing on the 'in-between' areas that exist between urban and rural poles. These in-between spaces are the residual byproducts of contemporary urbanisation processes, characterised by rural-urban interfaces that exhibit dynamic and ongoing interactions among social, economic, and environmental systems (Zetti, Rossi 2022). Consequently, this paper contributes to the discourse on redefining urban and rural areas, emphasising their increasing interconnectedness. Utilising a comprehensive database of work contracts from the Slovak Social Insurance Company for 2022, it investigates the geographical patterns of where individuals work versus where they reside, highlighting the geo-economic connections that warrant a redefinition of 'rural areas'. The findings underscore significant challenges related to commuting and provide a foundation for policymakers

to develop data-driven strategies for enhancing urban and rural planning from a geo-economic perspective.

## Theoretical background

Identifying rural and urban areas in the Central and Eastern European (CEE) region, particularly in post-communist countries, has been a complex task due to the extensive transformations these countries have undergone over recent decades. The processes of suburbanisation, which began in Slovakia in the 1990s following the change in political regime, have further complicated this identification.

Eurostat (2011) classifies cities based on the Degree of Urbanisation (DEGURBA) into three categories: (1) Cities, which have high population density and serve as significant economic, political, and cultural centres; 2) Towns and suburbs, which have moderate population density and typically function as commuter zones or local hubs; and 3) Rural areas, which are characterised by low population density and a primary focus on agriculture, with less urban development. These rural areas often serve as commuter zones, encompassing the surrounding travel-to-work areas of a city where at least 15% of employed residents work in the city (OECD, 2012). In Slovakia, the most appropriate definition comes from ESPON (2024), which describes small and medium-sized towns as urban settlements with populations between 5000 and 50,000 inhabitants, and a population density ranging from 300 to 1500 inhabitants per square kilometre. The definition of a town or city varies across neighbouring countries. While population criteria are not always critical, administrative criteria tend to prevail. Other considerations, including administrative functions, public utilities (such as schools, hospitals, and employment services), population density, and architectural aspects, are also taken into account (Dická et al. 2019).

Studies often focus on the necessity for densely populated areas to maximise economic advantages (e.g., Huang et al. 2020). This urban-centric bias assumes that living preferences can be dictated by policy, ignoring both practical realities and democratic preferences. Economists have shown a somewhat contradictory attitude towards rural

areas, particularly in Europe, where small towns are often nostalgically appreciated but overlooked in the broader context of economic progress (Borseková et al. 2015, Biegańska et al. 2018, Cole, Murray Svidroňová 2021). Rural areas offer more than just food production and resource extraction. This dichotomous perspective also neglects several crucial points:

1. The industry premium of certain high-paying sectors is largely separate from the location premium. This means that salaries are consistent across a country while living costs can vary significantly. College-educated individuals are more likely to relocate to high-cost cities, but this does not necessarily result in a proportional wage increase (Card et al. 2021).
2. International trade, including foreign direct investment, and automation have pushed non-college individuals into low-wage jobs and away from middle-skilled occupations, creating a steep wage premium in urban areas (Autor 2019).
3. Various housing reports emphasise that rising costs have turned housing into a significant issue for Europeans. Housing expenses are increasing at a faster rate than income, leading to challenges with housing exclusion. Addressing these issues in large urban centres often feels more aspirational than realistic, as few cities within the European Union (EU) promote high-density housing. Additionally, unaesthetic blocks of flats serve as reminders of the communist era (Pittini et al. 2017, Le Goix et al. 2019, Cole, Murray Svidroňová 2021).
4. Despite urban planners' disdain, suburbs remain popular, offering single-family housing and a broader sense of community (Conn 2014, Logan 2021).
5. A study by ESPON (2017) has found that while almost all city regions are growing, half of the European population still live in shrinking regions or cities. Similar findings were reported by Wolff and Wiechmann (2018), and Khou et al. (2022), raising the question of whether an inflection point has been reached.
6. The recent events of the COVID-19 crisis and the war in Ukraine have already impacted demographics (Dominese et al. 2020) and are likely to shift attention toward the development of rural areas. The COVID-19 pandemic

has also expanded opportunities for communities in smaller municipalities by enabling connectivity that does not require physical presence.

The points mentioned above highlight the need to redefine the concept of 'rural areas' from a geo-economic perspective. What is the proportion of individuals with rural residency who have connections to urban economies? How can we assess the level of economic connection to urban centres instead of solely depending on population density to define rural areas? Historically, Slovakia has had a relatively even distribution of towns and cities outside its primate city<sup>1</sup>, Bratislava. Despite this balanced settlement pattern, economic growth has been concentrated in the Bratislava-Žilina-Nitra triangle in the western part of the country, which is closer to Western European markets. Businesses have traditionally favoured this area, raising the question: Can the less favoured regions of Slovakia survive and thrive amid demographic changes and recent developments, such as the widespread adoption of remote work?

Slovakia's distinctive size and urban distribution contribute to a lesser tyranny of distances, with small urban centres situated relatively close to one another. In contrast to larger European countries, where rural areas are often widely scattered, Slovakia's compact geography allows rural regions to maintain functional connections to urban amenities. The country's highway system is finally realising its potential, with the completion of four-lane corridors alleviating travel constraints. Shopping options that were once predominantly available in the capital city are now more widely accessible, and Internet shopping continues to gain momentum each year. Importantly, a significant number of 'professional white-collar refugees', particularly those in the digital economy, have relocated to more rural areas, demonstrating that living arrangements in less populated regions

<sup>1</sup> The concept of a primate city was first proposed by geographer Mark Jefferson in 1939. He defines a primate city as one that is "at least twice as large as the next largest city and more than twice as significant". Beyond size and population, a primate city typically holds a dominant position in all facets of its country's society, including economics, politics, culture, and education. Primate cities often attract the majority of a country's or region's internal migrants.

can be economically viable. This is supported by a 10-year study of Slovak students from Matej Bel University in Banská Bystrica, conducted by Bodá et al. (2022), which has found that Generation Z shows a greater preference for living outside major cities compared to previous generations. Unlike millennials, who often felt compelled to seek better opportunities abroad, Generation Z does not share this same urgency. Moreover, Slovakia's unemployment rate decreased from 15% at the beginning of 2010 (amid the 2008 financial crisis) to 4.9% in December 2019 (before COVID-19) and 5.4% in February 2025, indicating that Generation Z does not view travelling abroad as necessary for gaining experience or earning a higher income. Many students envision future careers in city centres while favouring homeownership in small towns or suburbs. Commuting by car is not perceived negatively when necessary. As Székely and Novotný (2022) have shown, economically active residents in small rural municipalities, particularly those outside major public transport routes, meet their transport needs by purchasing cars.

In many countries, the distinctions between urban and rural areas are increasingly blurring in terms of population density, environmental amenities, lifestyle, education, service availability, and access to information and communication technologies. Consequently, an extension and modification of the OECD typology (Dijkstra, Poelman 2008, 2011) is necessary.

## Research data and methodology

This paper aims to measure the connectivity of rural areas to workplaces, with a special focus on the rural-urban divide. We achieve this by mapping where people live and where they work using a database from the Slovak Social Insurance Company from 2022. The database contains over three million work contracts, including postal codes (ZIP/PSCs) for the places of residence and workplaces. It also includes records of work contracts for foreign nationals, copyright royalties, and cases where the postal code of either the residence or workplace was missing, which we excluded from our analysis. Our examination focused solely on employment contracts of individuals residing in rural areas, and we did not

include the Bratislava region in this study. As a result, we narrowed the dataset to 1,520,797 records. This dataset was then converted into the MS SQL Server database system to facilitate the individual analyses. For our research, we formulated the following research question (RQ):

RQ: What are the percentages of insurance contracts based on the geographic distribution of place of residence and place of work for 2022, particularly concerning the rural-urban divide?

To compare the definitions of cities found in the literature review and to address the RQ, we categorised ZIP codes by geographic locality using the following six types of ZIP/postal codes:

- Urban (U): postal codes located within urban centres with populations exceeding 50,000. There are 11 cities that qualify as urban centres.
- Bratislava (UBA): the capital city of Slovakia.
- Bratislava Commuter Zone (UBAc): the extended urbanised area comprising the greater Bratislava metropolitan region.
- Commuter Zone (C): postal codes that fall within 10 km of an urban centre. This range extends to 15 km if a divided highway connects it to the urban centre.
- Micropolitan Centre (M): these are towns with populations between 10,000 and 45,000, totalling 60 towns overall. Micropolitan centres serve as urban hubs on a smaller scale. In post-socialist countries, such as Slovakia, these smaller urban centres often feature a mix of high-rise apartment buildings and a central city area. This is also true for communities closer to the 10,000 population mark. Therefore, size does not always align with the typical urban aesthetic.
- Rural (R): this category includes postal codes of municipalities with populations under 10,000 that are not adjacent to an urban centre. To accurately identify ZIP code areas, we utilised the presence of a local post office to ensure a unique address. Through this method, we identified a total of 919 rural postal zones.

We further divided the main research question (RQ) into five sub-research questions (SRQs) to investigate the following data:

SRQ1: What percentage of individuals (work contracts) live in and have a work connection in the same rural ZIP code?

SRQ2: What percentage of individuals live in and have a work connection in a rural ZIP code (rural home ZIP + rural ZIP)?

SRQ3: What percentage of individuals live in a rural area and have a work connection to a micropolitan area?

SRQ4: What percentage of individuals live in a rural area and have a work connection with an urban centre (urban + commuter ZIP)?

SRQ5: What percentage of individuals live in a rural area and have a work connection to Bratislava or its commuter zone?

The Bratislava region was excluded from this analysis because it contains the capital city, which has both the NUTS-1 and NUTS-2 levels of government. Additionally, this region accounts for only 4.7% of Slovakia's total area and has very few rural ZIP codes. Out of the 3329 ZIP codes, 2065 corresponded to institutional entities, both governmental and private, rather than specific geographic locations. The remaining 1264 ZIP codes represented geographical areas that we were able to GPS locate. Unfortunately, an accurate GIS map of ZIP code boundaries is not available. We used MS Power BI to geo-locate the post office addresses for each of the PSCs. This approach allowed us to create a cartodiagram illustrating urban and rural areas (Fig. 1).

It is important to note that a working ZIP code does not necessarily represent the actual working address. The ZIP code associated with employment may differ from the workplace location; for instance, the head office (which houses the payroll) may not be the same as where an employee physically works. This discrepancy between the registered employer address and the actual work site is usually more significant for large corporations with multiple offices than for smaller businesses, which tend to have locations that align more closely with the primary workplace. Payroll data and tax records typically follow the employer's official registration, but they are often used as proxies in labour market research. Additionally, we believe that individuals who live in rural areas but work in urban settings may experience greater spatial ambiguities compared to those who both live and work in rural areas. This latter group is more likely to reflect an authentic rural labour experience and mindset.

Urban centres, commuter zones, and micropolitan areas represent different forms of urbanised environments, even though only two cities in Slovakia have populations exceeding 100,000. We assumed that most residents in an urban centre, a commuter zone, and a micropolitan area were employed in urban settings, so our initial

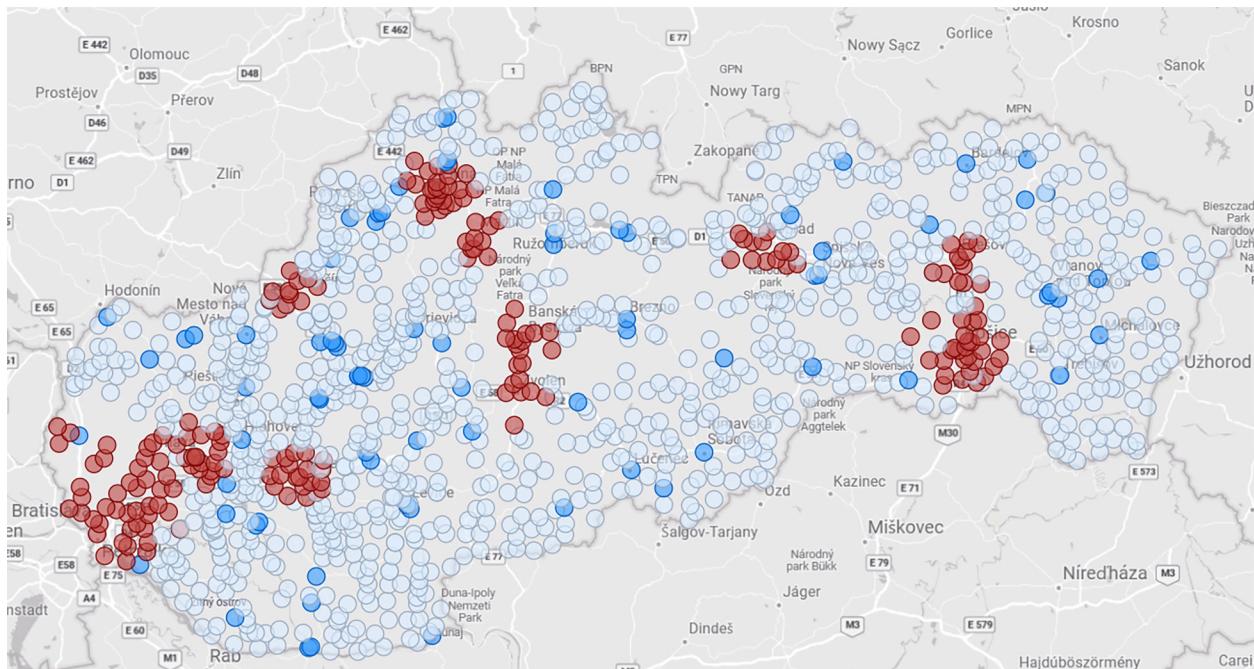


Fig. 1. Urban and rural areas in Slovakia.  
Bratislava Commuter Zone, Urban and Commuter Zone – red colour; Micropolitan Centre – dark blue colour; Rural – light blue colour.

research did not focus on them. However, it raises the question of how rural areas are connected to these more urbanised regions. If a rural area has over a 50% economic connection to one of the urban centres mentioned, then *rural* can be considered an aesthetic condition reflecting the countryside's visual, cultural and social aspects—rather than an economic one. In this scenario, the rural region may be perceived as a less populated extension of an urban commuter zone. Woods (2011) and Halfacree (2007) illustrate how certain rural areas can transition into commuter belts while preserving their rural character. Research by ESPON (2017) on functional urban-rural linkages found that rural regions with significant commuting differed from those that primarily offered local employment. This perspective may shift how we define and perceive what rural areas truly are.

## Results and discussion

For the RQ, we aimed to evaluate how rural areas are economically connected to work

headquarters (HQ). Our analysis was based on six ZIP code types (urban, rural, commuter, etc.) and included five SRQs, with a specific focus on rural residents. The data addressing these RQs are presented in Table 1, which provides a detailed breakdown of the percentage of individuals who live in rural areas and have work connections across different geographic categories, including same rural ZIP codes, rural-to-rural connections, micropolitan areas, urban centres, and the Bratislava Commuter Zone.

In the country as a whole, 56.9% of people living in rural areas are connected to some form of urban centre, while the remaining 43.1% reside and work exclusively in rural areas. Notably, 13.76% of institutional headquarters—both governmental and corporate—are situated in or around the capital, Bratislava, which contributes to its significant level of primacy. Based on the data presented in Table 1, the analysis of the SRQs provides several key insights into rural economic connections and commuting patterns. SRQ1: The percentage of individuals living and working within the same rural postal code stands at 15.1% of all employment contracts.

Table 1. Rural ZIP codes and their connection to work ZIP codes by geographic type.

Region	Work HQ in the same rural ZIP as Home	Work HQ in different rural ZIP than Home	$\sum$ Work HQ in rural ZIP (R - R)	Work HQ in micropolitan or commuter area (R - M+C)	Work HQ in urban area / excluding Bratislava/ (R - U)	Work HQ in Bratislava or its commuter zone (R - UBA + UBAc)	$\sum$ Work HQ in urban area (R - U + UBA + UBAc)	Total number of work contracts
Žilina	33,730 (19.0%)	35,860 (20.2%)	69,590 (39.2%)	32,665 (18.4%)	50,417 (28.4%)	24,854 (14.0%)	75,271 (42.4%)	177,525 (100%)
Trnava	25,098 (11.8%)	42,964 (20.2%)	68,062 (32.0%)	35,520 (16.7%)	62,958 (29.6%)	46,155 (21.7%)	109,113 (51.3%)	212,695 (100%)
Trenčín	27,225 (14.2%)	60,778 (31.7%)	88,003 (45.9%)	38,537 (20.1%)	43,139 (22.5%)	22,049 (11.5%)	65,188 (34.0%)	191,728 (100%)
Prešov	36,222 (15.4%)	68,916 (29.3%)	105,138 (44.7%)	39,515 (16.8%)	64,447 (27.4%)	26,108 (11.1%)	90,555 (38.5%)	235,207 (100%)
Nitra	45,424 (14.3%)	97,518 (30.7%)	142,942 (45%)	56,224 (17.7%)	75,918 (23.9%)	42,565 (13.4%)	118,483 (37.3%)	317,649 (100%)
Košice	29,700 (15.2%)	64,284 (32.9%)	93,984 (48.1%)	19,735 (10.1%)	57,250 (29.3%)	24,424 (12.5%)	81,674 (41.8%)	195,393 (100%)
Banská Bystrica	30,115 (15.8%)	59,086 (31.0%)	89,201 (46.8%)	33,546 (17.6%)	44,791 (23.5%)	23,063 (12.1%)	67,854 (35.6%)	190,600 (100%)
$\Sigma$ of work contracts	227,513 (15.1%)	429,406 (28.0%)	656,920 (43.1%)	255,741 (16.8%)	398,920 (26.3%)	209,217 (13.8%)	608,136 (40.1%)	1,520,797 (100%)
SRQ	SRQ1		SRQ2	SRQ3		SRQ5	SRQ4	

The highest concentration is observed in the Žilina region, 19.0%, suggesting a strong local economic interdependence. This highlights the persistence of localised labour markets where rural residents remain employed within their immediate communities, probably due to region-specific industries or agricultural employment.

**SRQ2:** Rural-to-rural employment connections account for 43.1%, with the Košice region reporting the highest percentage of 48.1%. This suggests that a significant portion of the rural workforce remains within rural economic networks instead of commuting to urban centres. This trend may indicate a decentralised employment structure where rural enterprises and agricultural sectors provide sustainable job opportunities.

**SRQ3:** Employment links between rural areas and micropolitan centres account for 16.8%, with Nitra recording the highest proportion at 17.7%. This emphasises the economic role of mid-sized towns as employment hubs, acting as intermediary centres that alleviate full dependence on major urban areas. The distribution also suggests that while micropolitan centres contribute to regional labour dynamics, they do not fully absorb rural outmigration for employment.

**SRQ4:** Rural-to-urban employment connections (excluding Bratislava) represent 26.3% of the workforce, with the highest proportion found in the Trnava region at 29.6%. This indicates the continued reliance on urban centres for economic opportunities. Even though there are job openings in rural areas, a significant portion of the workforce still commutes to cities, likely in search of higher wages, greater industry diversity, and job stability.

**SRQ5:** Rural employment links with Bratislava and its commuter zone amount to 13.8%, with Trnava having the highest rate at 21.7%. This reflects the strong pull of the capital as a dominant employment hub, particularly for residents of the western regions. The broader Bratislava commuter belt underscores the impact of metropolitan economic influence, shaping labour mobility patterns and reinforcing regional disparities in commuting behaviour.

The data highlight a structural employment imbalance between rural and urban

areas. Certain regions, such as Košice and Banská Bystrica, manage to retain a higher proportion of their rural workforce locally, indicating stronger rural job markets. In contrast, Trnava and Nitra experience significant rural-to-urban migration for employment, reflecting a greater dependence on urban job opportunities. When considering the context of CEE countries, which are more homogenous than their Western European counterparts, it becomes clear that job opportunities in Trnava and Nitra are influenced by economic development driven by foreign direct investment (Gál, Lux 2022, Rusnák et al. 2023). These two regions emerge as dominant economic hubs, attracting over 50% of their rural workforce to urban centres. The impact of urban employment is less pronounced in Banská Bystrica and Košice, suggesting a more decentralised employment structure in those areas. This indicates that while some regions benefit from diversified job markets, others remain heavily reliant on cities for employment opportunities.

The share of rural workers employed in microcentres is relatively small compared to urban centres. In Košice, only 10.1% of rural residents work in microcentres, compared to 17.7% in Nitra. This disparity suggests that some regions have developed microeconomic centres more effectively than others, reducing the pressure on large cities. The data indicate that while Bratislava exerts a strong economic pull in the western part of Slovakia, especially in regions like Trnava, it is not the primary employment destination for rural residents on a national scale. A relatively low percentage of rural workers from other regions commute to Bratislava, suggesting that regional labour markets function independently to some extent. This is an important finding as it contradicts the assumption that Bratislava dominates the national labour market and is the centre of most of the commuting (Šveda, Barlík 2018, Maris et al. 2019).

To classify an area as truly rural, it is assumed that over half of the work contracts must originate from a rural region. Our analysis revealed that 258 regions with the 970 ZIP code exceeded this 50% threshold, accounting for 26.6% of rural areas, primarily located in the south and east of Slovakia (Fig. 2). However, there are some important considerations to note. The current postal system was established in 1973 during the

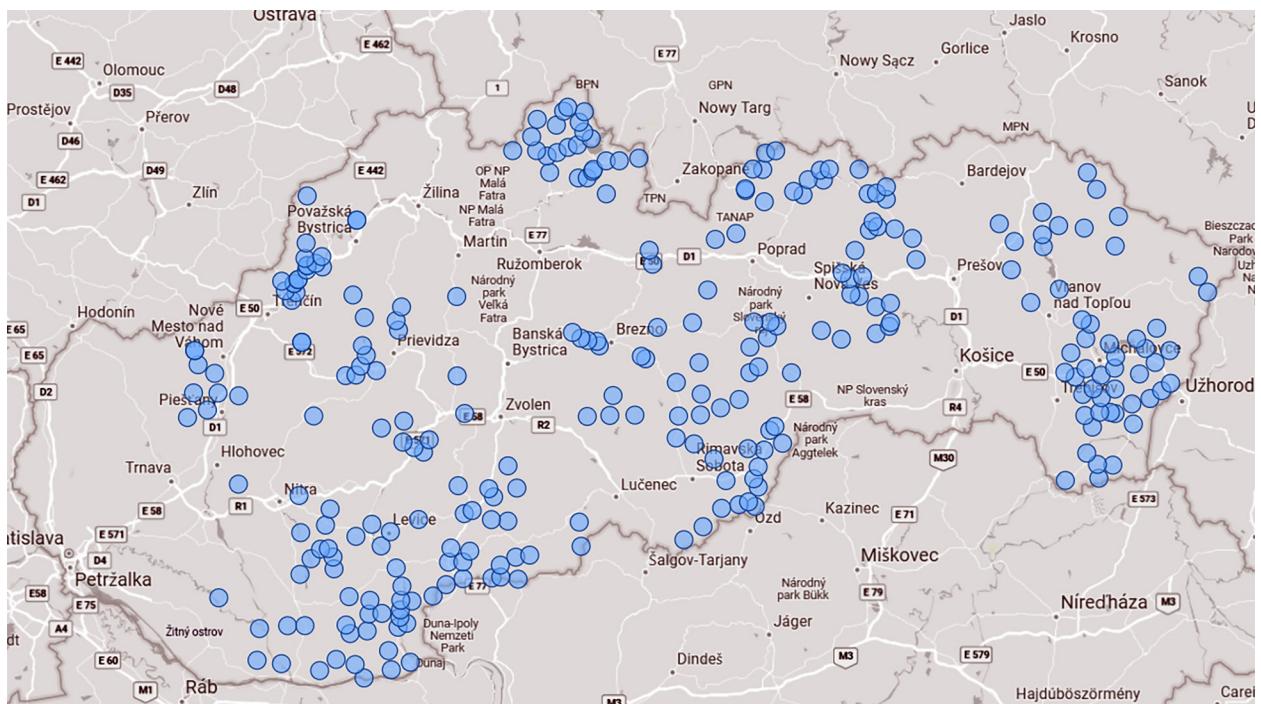


Fig. 2. Rural areas where more than half of the residents also work in a rural area.  
Rural areas – light blue colour.

socialist era, resulting in a territorial system that is a remnant of the past. Despite its shortcomings, the socialist system was notably supportive of small towns, ensuring a more even geographical distribution of economic activity, which is reflected in ZIP code distribution. Additionally, Slovakia's mountainous terrain affects the connections between residential and economic regions.

Slovakia's settlement structure is markedly different from that of larger countries, which affects its economic geography. The largest city, Bratislava, has a population of only 439,000, resulting in a more compressed urban hierarchy. Smaller towns in Slovakia hold more significance as the population numbers do not align with expected rank distributions. For example, a town with 10,000 residents is ranked 69th rather than the anticipated 44th. In contrast, a similar town in Germany would typically have around 172,000 residents, highlighting this disparity in size. When examining economic stagnation and 'left-behind places', we can see a fairly even distribution of gross domestic product (GDP) among regions outside Bratislava. This area has approximately ~twice the GDP value and ~three times the GDP per capita compared to other regions (OECD, 2022). However, relying solely on

GDP data can be misleading since land value distortions can affect the quality of life – illustrated by the difference between a compact flat in the capital city and a house with a garden in a rural setting. It is essential to determine whether these smaller towns are maintaining their economic functions or if stagnation is primarily affecting eastern and southern Slovakia. Additionally, the current post-COVID environment, rising inflation, and the ongoing globalisation reset may be reshaping rural dynamics.

## Concluding remarks

There are increasingly fewer differences between rural and urban areas, particularly in terms of their economic structures (Abreu, Mesias 2020) and intra-regional connectivity (McFarland 2019). Instead of merely considering (rural) space as relational, Heley and Jones (2012) argue that rural studies should adopt an epistemologically relational approach. This involves developing what Cloke (2006) refers to as 'hybridised theory' and Murdoch (2006) calls 'theoretical pluralism'. Rajendran et al. (2024) highlight the emergence of peri-urban spaces, while Zetti and Rossi (2022) emphasise the importance of in-between spaces.

This peri-urbanisation results in scattered and dispersive urban growth, creating hybrid landscapes that combine fragmented urban and rural characteristics, situated between the city and the countryside. One question that arises is whether digital connectivity has genuinely reduced economic disadvantages in rural areas. While the rise of remote work has allowed for greater spatial flexibility, there is limited evidence that it has significantly benefited rural areas on the inner periphery, which may still struggle with inadequate infrastructure, job opportunities, and essential services. Rural areas with urban linkages may possess a competitive advantage due to their better integration with economic and transport networks, particularly highways. Furthermore, migration to rural areas does not necessarily indicate a lifestyle-driven shift; it may instead be driven by economic pressures, housing affordability, or even an inherited social connection to the area.

The analysis indicates that the term 'rural' is open to interpretation. Aesthetically, the concept of rural evokes images of pastoral landscapes, including fields of grain, rolling hills, and grazing cattle, along with cultural traditions and established ways of life. However, there is a significant connection to urban centres that are economically more robust than these visuals might suggest. Our research shows that, on average, only 43.1% of rural work contracts involve individuals both living and working in rural areas. This means that the majority of work contracts have ties to urban environments. Some may argue that our inclusion of micropolitan centres, starting at a population of 10,000, is too low and may skew the data in favour of rural areas. Nonetheless, we have found that 40.1% of rural work contracts are linked to larger city centres (+50k population). Furthermore, 13.8% of work contracts are connected to the capital city (predominantly from the western part of Slovakia). In total, more than 53% of work contracts are associated with urban areas, highlighting their dominant role in the distribution of economic activities and the strong geo-economic connections between rural areas and urban counterparts.

Arguing that large metropolitan areas are necessary for economic efficiency overlooks the potential of smaller countries and relegates their territories to a lower status. This perspective also

ignores the fact that smaller countries tend to exhibit lower levels of inequality, as demonstrated by the Gini coefficient. For example, Slovakia ranks first or second in terms of the lowest Gini numbers in the EU (Kolluru, Semenenko 2021). Data indicate that the economic advantages for Slovakia are primarily concentrated in the western part of the country. This is evident in rural areas of the southern and eastern regions, where fewer than 50% of work contracts are urban. To address this imbalance, regions with significant rural-to-urban commuting may require policies that enhance rural employment opportunities. Promoting the development of microcentres in areas with limited local employment could alleviate urban congestion and contribute to a more balanced economy. While urban areas will likely continue to attract rural workers, decentralising job opportunities could improve workforce distribution. As demographics shift towards a smaller future generation, power may increasingly reside with individuals rather than firms, creating a greater need for businesses to cater to individual living conditions. Modern mindsets, evolving alongside technological advancements, may favour lesser-known commuter zones and inner peripheral urban areas, reflecting quality-of-life concerns. Promoting a high-tech economy and leveraging unique rural assets could attract new residents (Hardy 2024).

This paper is the first in a series of research studies that, among other things, will include data from the Social Insurance Company. Future research will incorporate the new Eurostat 'degree of urbanisation,' which uses population grid cells (number of inhabitants per km<sup>2</sup>) to classify areas as city (code 1), town/suburb (code 2), or rural (code 3). Additionally, we aim to assess the level of consumption opportunities by region and their relationship to natality opportunities, based on both population density and remoteness. Future studies could further investigate the impact of structural changes on the labour market and the daily lives of residents, including the socio-demographic characteristics of individuals who prefer to live in rural areas.

One limitation of our research is that it focuses solely on one country. However, Slovakia's smaller size has allowed us to plot and code all ZIP codes based on geographical type—whether urban, rural, or commuter zones. This task

could not be automated and would likely be more challenging in larger countries due to overwhelming data sizes. Other limitations include methodological issues related to ZIP codes and the increased share of remote workers following COVID-19, which affects the results based on ZIP codes. Nonetheless, many rural residents maintain strong economic ties to cities, challenging the traditional definition of rural areas.

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## Authors' contribution

DC: conceptualisation, methodology, investigation, writing – original draft preparation, visualisation; MMS: formal analysis, data curation, writing – original draft preparation; JG: data analysis, visualisation; PS: writing – review and editing.

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