

DISADVANTAGED AND DISADVANTAGING REGIONS: OPPORTUNITY STRUCTURES AND SOCIAL DISADVANTAGE IN RURAL PERIPHERIES

JOSEF BERNARD*  & SYLVIA KEIM-KLÄRNER** 

* *Institute of Sociology, Czech Academy of Sciences, Prague, Czechia. E-mail: josef.bernard@soc.cas.cz (Corresponding author).*

** *Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute of Rural Studies, Braunschweig, Germany*

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ABSTRACT

Regional peripheralisation has been repeatedly described as a process resulting in the combination of regional structural and social disadvantage. In theory, peripheries are characterised by the interdependence of these two types of disadvantage. Few studies have examined this interdependence in rural peripheries across several countries. In this study, we operationalise rural peripherality combining poor opportunity structures that constrain the social and economic opportunities of the local population, and increased concentrations of social disadvantage and decreased quality of life. Comparing Czech and eastern German regions, we uncovered intercorrelated spatial patterns of low education, poor employment quality, deficient labour market opportunity and accessibility to medical, educational and other services, which together represent key aspects of rural peripherality from the perspective of disadvantage. Although there is a clear coincidence of structural and social disadvantage in rural peripheries, neither increased levels of poverty nor long-term unemployment are typical of these areas.

Key words: Periphery; rural; opportunity structure; social disadvantage; inequality; Central Europe

INTRODUCTION

In recent years, the term peripheralisation has been discussed as a systemic societal risk. The concept captures the dynamics of spatial inequality, its mechanisms and its consequences; particularly, but not exclusively, in the central and eastern European context (Fischer-Tahir and Naumann 2013; Kühn 2015; Nagy and Timár 2017; De Renzis *et al.* 2022). It has been used to describe processes leading to regional disadvantages in a wide range of areas related to social, economic, infrastructure or power dynamics. Although this concept makes clear that peripherality is both an urban and a rural issue, in the professional debate, peripheral-ity is most often associated with rural regions,

whose ‘structural disadvantages are seen as intertwined with their geographical location’ (Steinführer *et al.* 2016, p. 2).

The essential outcome of peripheralisation, regional disadvantage, takes two distinct, albeit intertwined, forms. First, it describes the structural deficiencies of the regional economy, infrastructure, and services. Second, and no less important, it refers to increased regional concentrations of various forms of social disadvantage, deprivation, decreased quality of life or even health issues. Emphasising regional disadvantage as an essential outcome of peripheralisation has opened up new research questions that expand the traditional focus of regional economics. It explicitly emphasises

the perspective of residents' lives by asking how peripherality contributes to the (re)production of social inequalities, what forms of disadvantage inhabitants of peripheries are exposed to, and how they respond to their conditions (Bernard *et al.* 2023; Bürk 2013; Bernard and Šafr 2019). The importance of studying peripherality in this way has been amplified in recent years by the experience of the pandemic because, as Biglieri *et al.* (2021) put it: the virus was concentrated particularly in the peripheral, in spatial and social terms. Covid 19 thus highlighted the undesirable effects of the coincidence of spatial and social inequalities and the risks, the residents of disadvantaged areas are exposed to.

The concept of peripherality as an outcome of peripheralisation has rarely been operationalised to enable the measurement and comparison of the conditions in peripheral regions across different countries. From an empirical perspective, the spatial patterns of peripherality remain enigmatic, and empirical findings on peripheral regions are hardly comparable across case studies. The concept is often used in a time and space-dependent way (De Renzis *et al.* 2022). Some important exceptions include the paper by Copus *et al.* (2017), who based the operationalisation of inner peripheries in Europe on low economic potential, poor access to services of general interest and low socio-economic performance and studies that compared conditions in Central European Visegrad countries (Pénzes 2013; Tagai *et al.* 2018).

This paper responds to the lack of cross-national empirical evidence on social conditions in peripheral regions, and specifically in rural peripheries. Its added value consists in proposing an innovative way of theoretically informed operationalization of rural peripherality applying a resident's perspective, which can be used to go beyond the fuzzy notion of a 'complex' or 'overall' disadvantaged nature of rural peripheries and to specify more precisely the structure of disadvantage typical of rural peripheries.

We base our understanding of rural peripherality on the concept of 'regional opportunity structures' (Bernard *et al.* 2023) to capture the structural drawbacks of peripheral regions to which the inhabitants are exposed,

and the concept of social disadvantage to describe the increased concentrations of poverty and reduced well-being. We explicitly take into account that both opportunity structures and social disadvantage are multidimensional concepts.

We demonstrate the contribution of our approach in a comparative empirical study of rural peripheries in Czechia and eastern Germany. The analysis proceeds in three steps. (1) We examine how social disadvantage relates to opportunity structures and rurality, and whether there is a typical rural 'bundle' of disadvantage forms; (2) we detect the spatial patterns of rural peripheries; (3) we compare the social and economic conditions in peripheries with those in other regions and discuss the results in light of previous findings.

The choice of Czechia and eastern Germany is motivated by offering the possibility to contrast and compare rural peripherality in two countries with significant and research-reflected experiences of rural peripheralisation (Barlösius and Neu 2008; Fischer-Tahir and Naumann 2013; Pileček *et al.* 2013; Bernard and Šimon 2017). Indeed, the term 'peripheralisation' was initially developed in reference to rural areas in eastern Germany (Beetz 2008). On the one hand, both countries experienced similar historical and structural legacies, including a radical post-socialist transition in the early 1990s, which resulted in similar processes in their rural areas, including regional economic polarisation and a radical fall in agricultural employment. On the other hand, despite these joint legacies, political developments, economic processes, and migration patterns in eastern Germany in the post-socialist period differed from those in Czechia. The eastern German post-socialist transition was accompanied by enormous and sudden job losses; high unemployment rates; high rates of outmigration (Beetz *et al.* 2008). The regional economic decline in Czechia was, in general, not accompanied by high rates of rural outmigration and depopulation (Tagai *et al.* 2018). Comparing two countries allows us to accentuate the more general characteristics of rural peripheries that apply in both countries, but also to highlight the different manifestations of peripherality.

The paper is structured as follows: Section 'Conceptualisation of rural peripherality' describes the theoretical background and the conceptualisation of rural peripherality. Section 'Poor regional opportunity structures and social disadvantage as essential features of rural peripheries' explains the concepts of regional opportunity structures and social disadvantage as essential features of rural peripheries. Section 'The operationalisation of regional opportunity structures and social disadvantage in Czechia and eastern Germany' presents the methodology and data, Section 'Empirical analysis' the empirical analyses and Section 'Discussion and Conclusions' concludes with a discussion of the results.

CONCEPTUALISATION OF RURAL PERIPHERALITY

Over the last 20 years, the concept of peripherality has expanded, gradually shifting away from defining peripherality primarily as a locational characteristic derived from remoteness and poor access to economic hubs and towards framing it as an economically and socially produced disadvantage (Kühn 2015). Regional disadvantage in peripheries has been attributed to their poor connectedness or even decoupling from essential socio-economic trends and centres, and their dependency relations and resulting lack of power and autonomy. In the German debate in particular, decoupling and dependency became the two main explanations for peripheralisation. Decoupling refers to the periphery's lack of integration into innovative societal and technological impulses and trends; labour markets and welfare systems; and education, health, transport and other public services. Decoupling also refers to the infrastructure and technological deficits of peripheries that make accessing opportunities more difficult (Keim 2006; Steinführer *et al.* 2016). Dependency highlights another aspect of peripheralisation: the lack of economic and political power. It refers to the economic structure of peripheries, in which economic actors hold low positions in global value chains, public budgets depend on the redistribution of public funds, and power centres associated with the region are absent. These deficits constrain

autonomous political and economic agency (Kühn *et al.* 2017; Nagy and Timár 2017).

While decoupling and dependency can be seen as two explanations of regional peripheralisation, the outcome of both processes has been described as regional disadvantage in a broad sense. There are a number of more or less clearly defined terms that attempt to express the idea that some regions have economic and infrastructure deficits by referring to a form of regional disadvantage: for example 'marginal areas' (Leimgruber 2018), or 'left-behind places' (Ulrich-Schad and Duncan 2018). These concepts define regional disadvantage mainly in terms of structural weaknesses, such as poor regional economic conditions, thin labour markets or the insufficient provision of services.

Besides structural disadvantage, peripherality is also related to the perspective of social inequality. In a programmatic paper on peripheralisation, Kühn (2015) observed that the inhabitants of peripheral areas experience impoverishment and poverty. Peripheries are poor, not only in the sense that they have low aggregate economic output, but also because they have high concentrations of low-income and impoverished households. Beetz *et al.* (2008) even defined the link between the structural problems of the peripheral regions and social inequality as a constitutive feature of peripheralisation. He argued that peripheralisation represents the spatial organisation of social inequalities. Peripheral regions tend to have high unemployment, high poverty and low-income levels. The inhabitants of peripheries have limited opportunities to use various resources, and thus have reduced life chances. Fischer-Tahir and Naumann (2013) emphasised that inequalities of power and of access to material and symbolic goods are characteristic of spatial peripheralisation. Leibert (2013) expanded this idea further, arguing that the reduced life chances of the population in peripheries lead to social exclusion. A frequent consequence of this social situation is outmigration into places offering more opportunities (De Renzis *et al.* 2022).

A combination of the both above-mentioned perspectives makes it possible to understand peripheralisation as a process

resulting in two interconnected types of disadvantage: regional structural and social. A region's structural deficits, poor economic conditions, lack of accessibility and inadequate service provision may be expected to negatively affect the economic, social or health situation of its inhabitants. Thus, peripheries can be understood as simultaneously disadvantaged and disadvantaging regions.

Indeed, there is considerable evidence that places co-determine the life chances of their residents, whether at the geographical micro-scale of neighbourhoods (Petrović *et al.* 2020) or at the regional level (Cotter 2002; Bernard and Šafr 2019).

While the peripheralisation literature acknowledges that the difficult social situations of individuals and households are essential characteristics of peripherality, the nature of the association between regional and social disadvantage is rarely examined in depth. Little attention has been paid to the question of whether the main social effects of peripheralisation are poverty and deprivation, or some other forms of social disadvantage; or what aspects of well-being are most negatively affected by life in peripheral regions.

Based on these ideas and findings, we want to draw attention to the link between regional structural disadvantage and social disadvantage in rural peripheries. We define rural peripheries as predominantly rural regions that have structural deficiencies that constrain the social and economic opportunities of the local population, combined with increased concentrations of social disadvantage. In the next section, we propose the operationalisation of peripherality based on this two-sided notion of disadvantage. We use the concept of regional opportunity structures (Bernard *et al.* 2023) to refer to the potential constraints imposed by structural regional disadvantage, and the concept of social disadvantage (Midgley *et al.* 2003).

POOR REGIONAL OPPORTUNITY STRUCTURES AND SOCIAL DISADVANTAGE AS ESSENTIAL FEATURES OF RURAL PERIPHERIES

Regional opportunity structures refer to the unequal access to and quality of various

institutionalised opportunities, including economic opportunities accessed mainly through the labour market, public and private services and housing opportunities. Bernard *et al.* (2023) distinguish four types of regional opportunity structures: economic opportunities accessible predominantly through regional labour markets, public and private services, opportunities for community and civic engagement and opportunities arising from the natural and built environment. Previous research on spatial opportunity structures has mainly focused on the scale of urban neighbourhoods, even if some scholars have emphasised the salience of multi-level spatial contexts in people's lives (Petrović *et al.* 2020), and the need to broaden the spatial perspective (Van Ham and Manley 2012). The regional opportunity structure concept emphasises a multi-scalar approach to spatial structures that transcends individual neighbourhoods to include entire regions. Poor access to opportunities has been repeatedly conceptualised as a source of rural poverty and disadvantage both in United States and Europe (Tickamyer and Duncan 1990; Bernard *et al.* 2016). If we look at the structural shortcomings of peripheral regions through the eyes of their inhabitants, we can interpret them as poorly developed regional opportunity structures.

Several studies on peripheralisation in Germany and the Czech Republic have described decline or insufficient development of opportunity structures. Besides having labour market insufficiencies, German peripheralised regions have been characterised by a decline in public infrastructure and private services (mainly with regard to medical services, educational institutions, community centres, and local supply services) and a general decoupling from positive impulses for development (Barlösius and Neu 2008; Beetz *et al.* 2008). Similarly, descriptions of Czech rural peripheries also mention the lack of skilled and well-paid jobs, poor access to services and dependence on commuting (Temelová *et al.* 2011; Bernard *et al.* 2016).

The concept of social disadvantage is derived from mainly British analyses of social deprivation concentration (Midgley *et al.* 2003; Pacione 2004). Social disadvantage

occurs when individuals or households are unable to lead their lives in ways that are available to the majority of the population, and thus cannot fully participate in society (Shucksmith *et al.* 1996). In many cases, social disadvantage has been described in rather vague and general terms, such as having 'limited or denied access to worthwhile social goods or social positions' (Böhnisch and Schröer 2004). The strength of this concept is that it views the life situations of individuals multidimensionally, and refers not only to a lack in income, but also to shortages of material, cultural and social resources (Shucksmith *et al.* 1996). Various aspects of social disadvantage have been implicitly described in research on peripheralisation in Germany and Czechia. In the eastern-German peripheries, poverty, long-term unemployment and feelings of being left behind have been described (Beetz *et al.* 2008). In Czechia, researchers also emphasise low education and low incomes as a typical feature of social disadvantage in peripheries (Bernard and Šafr 2019) and opportunity deprivation consisting of impaired access to common levels of social and economic participation (Bernard 2018).

THE OPERATIONALISATION OF REGIONAL OPPORTUNITY STRUCTURES AND SOCIAL DISADVANTAGE IN CZECHIA AND EASTERN GERMANY

We used the theoretical considerations on regional opportunity structures and social disadvantage to operationalise rural peripherality in Czechia and eastern Germany. The operationalisation of the concepts in two separate countries proved to be a sensitive and challenging task due to differences between the countries in the data provided by the statistical authorities, the occupational statistics, and the welfare schemes. Generally, we relied on a combination of administrative data (labour market statistics, welfare, income) and census data and the analysis of spatial accessibility.

Subject to data limitations, we distinguish and measure four domains of regional

opportunity structures: labour market opportunity, housing opportunity, service accessibility and transport accessibility.¹ Labour market opportunity refers to the number and structure of the job offers the inhabitants of a region can expect to receive. It is measured using three variables: the number of jobs relative to the working-age population, the share of high-skilled (i.e. expert) jobs and the share of low-skilled (i.e. helper) jobs.² The job offers in regions with high levels of labour market opportunity are relatively extensive and skewed towards more skilled jobs. Housing opportunity refers to the affordability of housing. It is based on two variables: the average price of housing lots and the average rental price of apartments.³ Service accessibility is based on average road distances from individual settlements in the region to a selected set of 13 basic services that people seek to access regularly (except the place of work) or that are important welfare state services. These services include six medical services (general practitioners, dentists, gynaecologists, paediatricians, pharmacies, hospitals), primary schools, kindergartens, grammar schools, supermarkets, employment offices, police stations and petrol stations. The road distance to the nearest provider of each kind of service was measured for each settlement (village or town). Regional averages weighted by population were calculated. Transport accessibility is measured by the road distance to the closest train station with long-distance connections, and the road distance to the nearest highway exit.

We distinguish three domains of social disadvantage: educational disadvantage, poverty and lower-quality employment. These three domains represent the basic socio-economic components of widely used indexes of multiple deprivation.⁴ Educational disadvantage refers to low educational levels in the population, particularly among young adults. It is based on three variables: the share of people aged 15+ with at most ISCED level 2 education, the percentage of people aged 15+ without tertiary education entrance-level qualifications and the share of youth aged 20–24 without tertiary education entrance-level qualifications. Poverty was measured using three proxy variables related to long-term unemployment and social

benefit claimants: the share of long-term (1 year+) unemployed in the working-age population, the share of people receiving subsistence allowances and the share of households receiving housing allowances.⁵ Lower-quality employment refers to jobs providing below-average income, lower-skilled jobs and seasonal unemployment. The dimension has been constructed from three variables: average wage in the region, the share of inhabitants with predominantly manual jobs requiring no expert or specialist skills⁶ and seasonal unemployment.

In addition to opportunity structures and social disadvantage, we measure the degree of rurality for each region using a rurality index based on five intercorrelated indicators (settlement density, the share of agricultural and forestry area in the total area, the share of single- and two-family houses among all residential buildings, regional population potential,⁷ and accessibility to large urban centres⁸). Thus, the regional rurality level increases as the population density of settlements decreases, the built environment becomes more open, the landscape becomes more dominated by agriculture and forestry, the number of inhabitants living in the catchment area declines and the distance to large centres becomes longer (Küpper 2016).

For each region, we obtained the most up-to-date indicators available. Most recent data come from 2017. However, some data are only available for earlier years (2011 in the case of census data).

Spatial scale – We sought to position the analysis at the most detailed regional level possible given the available data for the two countries. This level is represented by ‘*Kreise*’ in Germany and by ‘*okresy*’ in the Czech Republic. Eastern Germany is divided into 77 *Kreise*, while Czechia has 78 *okresy*. A unique feature of the German regional division is the distinction between rural regions (*Landkreise*) and urban regions (*kreisfreie Städte*), whereby larger German cities form separate regions with high population densities. In order to harmonise the regional breakdown in the two countries, we separated larger towns from their surrounding districts in the Czech Republic as well. This regional reclassification was possible because in the Czech Republic, unlike in Germany, the indicators used are available in much greater spatial detail. The resulting

regional breakdown includes 89 regions in the Czech Republic with a median population of 103,000 and 77 regions in eastern Germany with a median population of 157,000. In both countries, the resulting regions have the same median population density of 116 inhabitants per km².

Constructing sub-indices for rural peripherality

– Individual sub-indices of rural peripherality were constructed separately for each country because the imperfect harmonisation of the data does not allow for the complete interconnection of the two datasets across the entire monitored territory. The sub-indices were created by a principal component analysis (PCA), with input variables measured for each region. The use of PCA allowed us to summarise the information by a smaller set of unidimensional normalised indices representing individual theoretically derived domains. We performed a separate PCA for each such domain in each country. In total, we created four aggregated indices of regional opportunity structures, three indices of social disadvantage, and one index of rurality in the two countries. The PCA provided one component in all cases (based on Eigenvalue greater than 1).⁹ Table 1 shows a strong coincidence of factor loadings in both countries of interest.

EMPIRICAL ANALYSIS

The empirical analysis is performed in three steps. First, the typical disadvantages in rural regions are identified. Second, the spatial patterns of rural peripherality in eastern Germany and Czechia are determined. Third, the social situations in rural peripheries are described and compared with those in other regions.

What are the typical forms of disadvantage in rural regions? Relating regional opportunity structures and social disadvantage to rurality

– A correlation analysis of individual indices suggests that there are interrelations between disadvantage and rurality, in both countries (see Table 2).

The matrix of correlations reveals remarkable similarities between the two countries. In both countries, rurality is negatively correlated with most indices of opportunity structures,

Table 1. *Factor loadings of variables in sub-indices.*

	East GE regions	CZ regions
Regional opportunity structures		
Labour market opportunity		
Ratio of jobs to working-age population	0.699	0.896
Ratio of expert jobs to all jobs	0.916	0.912
Ratio of helper jobs to all jobs	-0.789	-0.888
Housing opportunity		
Average prices of housing lots	0.944	0.943
Average rental (purchase) prices for apartments	0.944	0.943
Service accessibility		
Distance to the next general practitioner	0.950	0.915
Distance to the next paediatrician	0.924	0.880
Distance to the next dentist	0.946	0.923
Distance to the next gynaecologist	0.945	0.866
Distance to the next pharmacy	0.954	0.888
Distance to the next kindergarten	0.890	0.776
Distance to the next hospital	0.863	0.730
Distance to the next state police	0.662	0.772
Distance to the next primary school	0.931	0.819
Distance to the next upper secondary school	0.913	0.897
Distance to the next supermarket	0.909	0.850
Distance to the next petrol station	0.900	0.882
Distance to the next job centre	0.751	0.705
Transport accessibility		
Distance to the next train stop with long-distance connections	0.850	0.889
Distance to the next motorway	0.850	0.889
Social disadvantage		
Educational disadvantage		
Share of people with at most ISCED level 2 education	0.943	0.972
Share of people without higher education entrance qualifications	0.979	0.942
Share of people aged 20–24 without higher education entrance qualifications	0.942	0.912
Poverty		
Share of long-term unemployed	0.858	0.906
Share of households receiving housing allowances	0.650	0.962
Share of people receiving subsistence allowances	0.851	0.969
Quality of jobs		
Share of people holding lower-skilled jobs	0.876	0.905
Average monthly gross earnings	-0.922	-0.903
Seasonal unemployment	0.736	0.808
Rurality		
Settlement density	-0.945	-0.883
Share of agricultural land	0.928	0.878
Share of family houses	0.919	0.769
Population potential	-0.709	-0.933
Accessibility of centres	0.794	0.912

with the exception of housing opportunity; whereas rurality is positively correlated with social disadvantage indices, with the exception of the poverty index, for which the correlation is negative. A full correlation matrix, included as online supplemental material,

reveals further similarities. Indices of regional opportunity structures are strongly positively intercorrelated in both countries, with the exception of housing opportunity, which is negatively correlated with other opportunity structure indices. While there is a strong

Table 2. Bivariate correlation between rurality and forms of disadvantage, eastern Germany and Czechia.

	Labour market opportu- nity	Housing opportunity	Service accessibility	Transport accessibility	Educational disadvantage	Poverty	Low employ- ment quality
Rurality	-0.664	0.646	-0.880	-0.678	0.695	-0.189	0.806
Eastern German regions	-0.502	0.705	-0.764	-0.414	0.456	-0.420	0.651

Note: EastGe N= 77, CZ N= 89.

correlation between educational disadvantage and low employment quality index values, both indices of social disadvantage are only weakly correlated with poverty. Moreover, the domains of social disadvantage and opportunity structures are also intertwined. Labour market opportunity and service and transport accessibility are negatively correlated with educational disadvantage and low employment quality in both countries; but they are independent of poverty or are even positively correlated with poverty, in Czechia.

The correlation matrix can be interpreted as follows. At the regional level, poor opportunity structures indeed coincide with social disadvantage, as assumed by the peripheralisation theory, and both poor opportunity structures and social disadvantage accumulate in rural regions. However, this general picture assumed by peripheralisation theorists needs some important qualifications, particularly with respect to housing affordability and poverty. In both countries, opportunities to find affordable housing are significantly higher in regions with otherwise lower-developed opportunity structures and higher disadvantage levels. This is not surprising, but it points to the diversity of opportunity structures and existing compensation mechanisms. Furthermore, in neither country, restricted opportunities or other forms of disadvantage are accompanied by increased poverty levels. This particular finding has important consequences for the conceptualisation of peripherality. As we noted above, it has been repeatedly argued that poverty and the issues associated with it are important outcomes of peripheralisation and are among the major issues in peripheral and economically poor regions. The data from eastern Germany and Czechia paint a much less convincing picture. Social disadvantage in regions with poorly developed opportunity structures manifests itself more in low educational levels and an occupational structure dominated by manual, lower-skilled, and lower-paid jobs. As measured by long-term unemployment and welfare dependency levels, poverty is spatially more or less decoupled from the other regional disadvantage forms.¹⁰

In both countries, the same bundle of regionally interconnected disadvantage

forms is emerging: poor labour market opportunities due to limited job offers skewed towards lower-skilled jobs; deficient service and transport accessibility; social structures characterised by lower education, higher manual employment, lower income and relatively high seasonal unemployment levels. In both countries, components of this bundle of disadvantage forms are positively related to rurality, although not all rural regions are affected in the same ways.

We use this disadvantage bundle to operationalise rural peripheries defined above as predominantly rural regions facing structural disadvantages that constrain the social and economic opportunities of the local population, combined with increased concentrations of social disadvantage.

Spatial patterns of rural peripherality in Czechia and eastern Germany – To investigate the spatial patterns of rural peripheries, we created an index of rural peripherality based on the disadvantage bundle identified as typical of rural regions in the previous section. Thus, we summed the values of the indices included in the bundle of individual disadvantage forms.¹¹ All sub-indices have the same weight in the resulting index.¹² The index strongly correlates with rurality in both countries, although the correlation is even stronger in the eastern German regions than in Czech regions ($r=0.71$ in CZ, $r=0.90$ in East Ge).

A map that projects the index values onto individual regions reveals the basic spatial patterns (Figure 1).

The basic spatial pattern of rural peripheries is similar in both countries, with rural peripheries being located some distance away from large cities and their hinterlands, and urbanised regions having the lowest peripherality levels. In Czechia, the economic attractiveness of Prague also affects its wider surroundings. In eastern Germany, metropolitanisation effects are less apparent because of the less pronounced economic position of Berlin. This finding goes hand in hand with the recent conclusions of Grove and Volgmann (2022), who showed that a large part of cities in eastern Germany were not

able to regionalise their metropolitan functions significantly unlike southern and western German cities. Most peripheral regions are concentrated in the northern part of eastern Germany, covering large areas of Mecklenburg-Vorpommern as well as adjacent areas of Brandenburg and Sachsen-Anhalt. There are smaller peripheral areas around the Thüringen border and along the border between Sachsen and Brandenburg. In Czechia, rural peripheral areas form elongated belts in the predominantly mountain border regions and appear in a few relatively remote inland rural regions. More urbanised areas, including areas dominated by smaller cities, such as those in Sachsen in Germany or in eastern Czechia, are protected from the most pronounced manifestations of rural peripherality.

Describing the social situations in rural peripheries – To describe the social situations in rural peripheries and to show how much peripheries differ from the other regions, we divided the regions in both countries into quintiles based on the values of the rural peripherality index and compared the situations in the most peripheral quintile (most peripheral) to those in the second, third and fourth quintiles (mixed); in the fifth quintile (non-peripheral). In both countries, the non-peripheral regions mainly consist of urban regions and their adjacent areas (see Figure 1). The share of the population living in these regions is 35 per cent in Czechia and 41 per cent in eastern Germany. The share of the population living in the most peripheral regions, which generally have relatively low population densities, is 13 per cent in Czechia and 11 per cent in eastern Germany. Table 3 shows selected indicators for describing and comparing regional situations, a full list of indicators is included as online supplemental material.

Not surprisingly, the most peripheral regions in both countries have the highest rates of various forms of social disadvantage and the least developed opportunity structures. This is because of how the peripherality index is constructed. Compared with other areas, rural peripheries have lower job

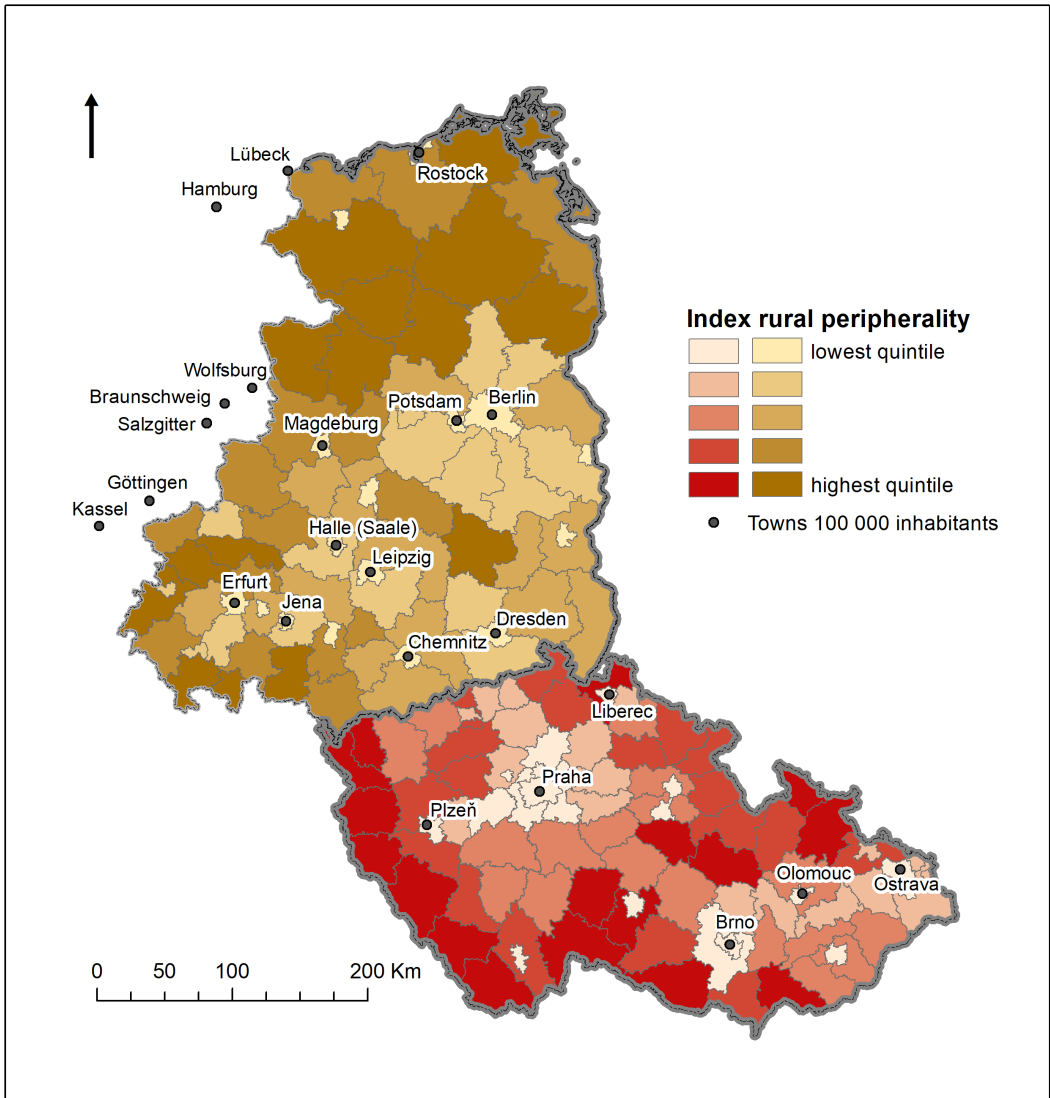


Figure 1. Rural peripherality in eastern Germany and Czechia.

Note: Spatial scale - *Kreise* for eastern Germany, *okresy* (transformed) for Czechia. Source: Authors.

densities. Their economic function is significantly weaker than their residential use, and their inhabitants tend to commute to other regions. In addition, the structure of job opportunities in the peripheries is somewhat skewed towards less-skilled work. This pattern corresponds to the lower educational structure in the periphery, which is also reproduced in the younger generation. While a majority of young adults in urbanised regions

have university education, most young people in rural peripheries still complete secondary education only. At the same time, manual employment with lower wages prevails in the peripheries. Compared with incomes in non-peripheral urban regions, incomes in the peripheries are about 20 per cent lower in eastern Germany and are more than 30 per cent lower in the Czech Republic. Seasonal unemployment is rather exceptional in both

Table 3. *Selected opportunity structures and social disadvantage indicators in peripheries.*

	Eastern Germany			Czechia		
	Most peripheral	Mixed	Least peripheral	Most peripheral	Mixed	Least peripheral
<i>Labour market opportunity</i>						
Ratio of expert jobs to all jobs	8.7%	9.7%	16.7%	21.5%	23.0%	34.2%
<i>Housing opportunity</i>						
Average prices of housing lots (m ²)	26 €	37 €	336 €	486 CZK	559 CZK	4,156 CZK
<i>Service accessibility</i>						
Distance to the next general practitioner	3.0 km	2.2 km	0.6 km	1.9 km	1.5 km	0.8 km
<i>Transport accessibility</i>						
Distance to the next train stop with high-speed trains	10.8 km	7.7 km	2.7 km	17.5 km	8.6 km	6.0 km
<i>Educational disadvantage</i>						
Share of persons without tertiary education entrance qualifications	80.8%	77.7%	60.8%	62.5%	59.0%	43.0%
<i>Poverty</i>						
Share of long-term unemployed	2.7%	2.2%	2.1%	0.9%	1.0%	0.9%
<i>Quality of jobs</i>						
Average monthly gross earnings	2,174 €	2,243 €	2,672 €	24,538 CZK	26,849 CZK	37,065 CZK

Note: Data refer to the 2011–2017 period. The most recent accessible data were used throughout. For reasons of space, the table only contains selected indicators.

countries, but it is still significantly higher in the peripheries than it is elsewhere. The spatial availability of services and transport opportunities is systematically worse in the peripheries than in other regions. Due to their rural character, the average distances to the nearest services are usually several times longer in peripheries than in urban regions. The poverty indicators do not show the same clear pattern as other variables. In eastern Germany, the peripheries have slightly above-average rates of long-term unemployment and relatively high proportions of households receiving housing benefits, but relatively lower subsistence allowances. In Czechia, the values of poverty indicators are effectively independent of peripherality.

In most indicators, the rural peripheries differ weakly from the group of average (mixed) regions. There are significantly larger differences between mixed regions and non-peripheral regions. Therefore, in terms of their social situations and access to opportunities, peripheries do not appear to be pronounced spatial outliers. Non-peripheral urban regions have much more of an outlier position. Thus, the data does not show major dividing lines in terms of opportunity structures and social disadvantage between the peripheral regions and a remaining socio-economically integrated spatial complex. Such a line can be found rather between non-peripheral metropolitan and urban regions on the one hand and rural areas on the other. Thus, the rural peripheries are most affected by forms of disadvantage that are typical of other rural regions as well.

DISCUSSION AND CONCLUSIONS

The operationalisation of rural peripherality applying a perspective of residents' lives as a concept encompassing the structural and social forms of disadvantage typical of rural regions offered a tool for anchoring the concept of rural peripherality in empirical data and to uncover the structure of disadvantage in rural peripheries. We used it to study rural peripheries in Czechia and eastern Germany. The results reflect the reality in the two countries, but also provide important insights

for further conceptualization and research on rural peripherality. First, we briefly discuss the empirical results on the Czech and German peripheries in the light of older research, before we clarify in depth the more general evidence on rurality and peripherality this paper provides.

Basically, the analysis describes the Czech and German rural peripheries similarly to previous research. These are rural regions located mostly outside the reach of major cities. Although a spatial factors may also contribute to peripherality (Copus 2001), the resulting spatial pattern still shows that in both countries, substandard opportunity structures and social disadvantage concentrate particularly in weakly urbanised areas with poor access to large cities. Typical features include a multitude of challenges faced by the inhabitants of these regions, including poor access to medical and other services and transport, which is closely linked to low population densities and centralisation tendencies; and a substandard supply of jobs skewed towards low-skilled and lower-paid jobs. The social situations in rural peripheries are characterised by below-average education, including among the younger generations and high shares of employment in less-qualified and manual occupations. Similar features have been discussed in previous research (Musil and Müller 2008; Bernard *et al.* 2016; Beetz *et al.* 2008, Fischer-Tahir and Naumann 2013). In the case of Germany, it turned out to be very convenient that only eastern German regions were included in the analysis. The analysis was thus able to highlight significant differences in their level of disadvantage, which is somewhat lost when compared to West German regions, as the majority of eastern Germany is often referred to as a disadvantaged area in many indicators (Fink *et al.* 2019). The comparative nature of the analysis provides some insight into the intensity of individual challenges. Although accessibility to services is an important peripherality-related issue in both countries and has been repeatedly described as such (Naumann and Reichert-Schick 2012; Bernard *et al.* 2016), our analysis shows that the German peripheries are more affected by accessibility issues and characterised by a higher degree of service centralization.

Our analysis also generated two more general essential findings about peripherality and rurality. The first is that despite institutional differences in both countries, there is a very similar 'rural bundle' of disadvantage forms, which includes various aspects of the regional opportunity structure and specific forms of social disadvantage. We discovered strongly intercorrelated spatial patterns of educational disadvantage and low levels of employment quality, labour market opportunity and service and transport accessibility, which together form a predominantly rural configuration of disadvantage and represent a particular challenge in terms of quality of life. An important observation is that increased poverty levels are not typical of rural peripheries in either of the countries. Although poverty can be defined using various criteria, data from Czechia and eastern Germany show that at least the more severe manifestations of poverty associated with long-term unemployment and dependence on social benefits are not typical features of rural peripheries in either country. This may be partly due to the fact that in both countries under study, the Great Recession was followed by several years of significant economic growth, which resulted in a significant decline in unemployment and poverty even in peripheral regions.

Our findings are certainly influenced to some extent by similarities in the social structure and labour market of the regions studied, with generally low poverty rates and relatively significant rural industrialization in Czechia and eastern Germany. Yet, the striking closeness of results in both countries suggests that our findings regarding the nature of rural peripheries are not necessarily country-specific and could have a more general validity. Thus, the research and policy focus on poverty in rural peripheries (Leibert 2013; Németh 2019) should not obscure the more typical challenges inhabitants of peripheries face. At the same time, it calls for further comparisons particularly with countries in which poverty and material deprivation is more linked to rural areas, like Hungary (Pénzes and Demeter 2021).

The second finding is that there is no significant disadvantage gap between the most peripheral regions and other rural regions in

either country. There are, however, significant differences between urban and adjacent areas on the one hand and other rural regions on the other. Thus, a dichotomous concept of the periphery as a territory lagging behind and excluded from a remaining internally integrated spatial complex is misleading. Rural peripheries should instead be seen as regions where the socio-economic and disadvantage-related disparities that are typical of the differences between urban and rural areas are most pronounced.

From an analytical point of view, a major advantage of the index we used is that it relies on data available for relatively small regions below the NUTS-3 level, therefore it is much more sensitive to the existing regional disparities that are often overlooked by larger-scale analyses. This is particularly the case for countries with relatively large NUTS-3 regions, such as Czechia, where NUTS-3-based analyses show high spatial homogeneity. For example, the delimitation of inner peripheries in the European comparative Profecy project (Noguera *et al.* 2017) did not identify any region in the Czech Republic that would belong to the category of declining areas with poor socio-economic conditions, or to the category of interstitial areas with poor economic potential.

An important limitation of the approach we used to describe rural peripheries is the imperfect operationalisation of regional opportunity structures, which rather superficially captures the unequal accessibility and quality of institutionalised opportunities that produce and reproduce social inequality and the experience of disadvantage. Using cross-nationally comparable quantitative data comes at the cost of failing to capture less easily quantifiable dimensions of opportunity structures, such as opportunities for civic participation (Bernard *et al.* 2023), and more subjective forms of social disadvantage. Existing qualitative studies of living conditions in peripheries capture more sensitively how their residents perceive and evaluate their situation and how the social position of individuals intersects available opportunities (Bernard 2019; Knabe *et al.* 2021). Thus, considerable scope remains for the comparisons of qualitative case studies, as well

as for analyses linking individual-level with regional-level data.

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ENDNOTES

1. Despite significant efforts, we have not been able to produce fully harmonised data for some indicators. In these cases, we use logically similar proxy variables, which, however, do not have a substantially identical meaning in both countries. Data from the following sources have been used: Germany: Bundesinstitut für Bau-, Stadt und Raumforschung (inkar.de); Statistisches Bundesamt; Bundesagentur für Arbeit; Thünen Landatlas. Czechia: Český statistický úřad; Ministerstvo práce a sociálních věcí; Ministerstvo financí; Ministerstvo školství, mládeže a tělovýchovy; Český úřad zeměměřický a katastrální; ÚZIS.
2. For Germany, we used the classification of jobs into four skill requirement levels used by the Bundesagentur für Arbeit. For the Czech Republic, jobs were classified according to ISCO: expert jobs classes 1 and 2, helper jobs class 9. To reflect commuting over regional borders, a preliminary index of regional labour market opportunity is first calculated from the three underlying indicators for each region. In a second step, the final index value for region i is quantified as an average of values of all regions weighted by an impedance function based on the distance between regional centres: $\exp(-0,09d_{ij})$. Using an impedance function suggests that the potential opportunity in the two places is negatively related to the travel impedance between them (Liu and Zhu 2004).
3. For the Czech Republic, rental price is substituted by apartment purchase price given the dominance of owner-occupied housing in the Czech Republic and a lack of data on rental prices in regions.
4. For example, English index of multiple deprivation, German index of multiple deprivation. We set aside some additional domains contained in some deprivation indices (health, safety, housing, environment) that are less prominent in the debates on the outcome of peripheralisation.
5. The welfare systems of the two countries differ from each other, and the conditions of these welfare schemes are not harmonised. In Germany, a significantly higher proportion of the population receives these benefits. However, in both countries, both types of allowances are designed to help low-income households achieve a minimal standard of living and sustainable housing costs.
6. For German regions, we used the share of people employed in jobs with skill requirement levels 1 and 2 (Helfer, Fachkraft). In the Czech Republic, ISCO levels 5–9 were included.
7. Sum of the population in a 50km radius projected onto the 1 km grid of Eurostat with weighting decreasing proportionally with distance.
8. Sum of the population of the next five functional urban centres, weighted proportionally with the road distance.
9. Two components were extracted only for the index of service accessibility in the Czech Republic. In this case, the first component accounting for 71 per cent of the total variance was used. In all cases, the KMO indicator indicated values 0,5 and higher, showing that the data is suitable for PCA. Elbow plots of individual PCAs are included in the online supplemental material.
10. Despite the remarkable similarity of the correlation matrixes in the two countries, there are also noticeable differences between them. In eastern German regions, educational disadvantage and low-quality employment are more strongly related to rurality than in Czechia, where the urban–rural differences are less pronounced. By contrast, the negative correlation of poverty with rurality in Czechia reveals that poverty in Czechia is more of an urban issue. In eastern Germany, poverty levels are similar in urban and rural areas.
11. Labour market opportunities, service and transport accessibility, educational disadvantage and employment quality. Except for the spatially weighted labour market opportunity index, all other sub-indices are normalised so that no additional transformations are necessary when creating the final index. The labour market opportunity index was z-transformed before entering the final index of rural peripherality.
12. The extraction of a one-dimensional rural peripherality index is analytically justified due to the existence of mutual correlations between individual sub-indices. We further tested the

one-dimensionality using PCA, which provided a one component solution in both countries (based on Eigenvalue greater than one).

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