

A REGIONAL TYPOLOGY: DEVELOPMENTAL POTENTIAL OF REGIONS IN CZECHIA

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Abstract: The evaluation of regional disparities is one of the basic geographical topics. The commonly used division of the territory is based on the position of the region in relation to the main development centres and defines the territory into central, semi-central and peripheral regions. Development links to local and micro-regional development factors based on the quality of human resources and on human and social capital; the importance of identity and other soft development factors are not taken into account in similar works. In the proposed typology, where the micro-regional level are monitored, spatial units are divided into 4 or 5 main types according to the degree of their development capacity, both depending on the position of the region, which means based on their external conditions, and on the quality of soft factors, based on their internal conditions in the region. Internal and external conditions were prepared on the basis of a wide set of input data, which describe both the development characteristics in each region and the current situation in the second half of the second decade of the 21st century. The typology of regions in Czechia, both at the level of regions of municipalities with extended powers (206 units) or authorized municipal office (393 units), describes very well the basic regional differences in the Czech Republic. The draft typology serves as one of the bases for the Regional Development Strategy of the Czech Republic and for the Rural Development Strategy and is the basis for further considerations on the differentiation of subsidy support for individual types of regions with regard to the actual level of need for a specific subsidy title.

Key words: Typology, micro-regions, administrative units, inner and outer factors, Czechia

Highlights

- Rural communities are very diverse.
- Differentiation can be observed based on external factors such as location and settlement structure.
- Differentiation based on internal factors, including human and social capital, is also significant.
- Different types of rural areas have different prerequisites for development.

1. Introduction

Regional development is naturally tied to inequalities. This is one of the reasons why some regions are more successful and others, conversely, are less successful and must contend with various partial or more complex problems. Before 1989, regional inequalities in Czechia that stemmed from geographic location and the settlement structure were largely levelled out. The communist regime in Czechia, like those in other Central and Eastern European countries, sought to minimise regional inequalities (especially inequalities in the population's income and access to amenities). It was only in the post-totalitarian Czech Republic in the 1990s that natural processes of regional development fully emerged, the effect of which was to deepen both social and regional disparities. In recent decades, expert discussions have therefore begun to focus on issues related to the indicators chosen to assess regional disparities and on analysing the conditions and mechanisms behind the differences in regional development – especially those that led to growing disparities between regions.

Today, when we assess regional differences, it is not enough just to describe the distribution of individual phenomena. It is also necessary to use a complex approach including both problems and progress connected to the external frameworks of regional development (which are addressed, for example, by the group of theories on global production networks – e.g., Coe, Dicken, and Hess 2008) and the internal conditions of these processes (Johansson, Karlsson, and Stough 2011). In addition to the position a region has within a regional system, the degree of concentration of the population and functions in a region,

the success of a region's development also depends on the kind of activity of regional actors that tends to be associated with the quality of soft factors (specifically, for example, with leadership skills – Sotarauta 2005) or with various forms of networking among actors (see Cannarella, Piccioni 2008)). The substantial differences that exist between municipalities in the Czech Republic in terms of these factors has been demonstrated by Blažek and Netrdová (2009), who showed how significant external factors (location in particular) are for the development of municipalities, as well as the importance of an inner factor. Among the internal factors, the authors include the quality of human capital, as it leads to differences in the quality of life between municipalities that otherwise have the same external conditions of development. Differences in the quality of life in municipalities have likewise been documented by Novák and Netrdová (2011).

The assessment of the regional differentiation of the Czech Republic in this article is therefore based on the analysis of external and internal factors of development characterized by statistical indicators of settlement structure and hierarchy, functional specialization, and the quality of human capital. The main statistical tool used was factor analysis. We aimed to distinguish types of rural regions with different development potential, as the typology became the basis for the formulation of a regionally differentiated rural development policy. This is also the reason why our typology is based on administrative (political) territorial units (Administrative Districts of Municipalities with Extended Powers – further: MEP) rather than natural ones (e.g., nodal regions according to the labour flows). The presented typology was one of the sources for the formulation of the Rural Development Strategy set up by the Ministry of Local Development of the Czech Republic.

In our interpretation of regional typology, we emphasize rural or non-metropolitan areas, which – according to Ženka and Slach (2017) – in 2013 concentrated 44.4% of the population, 61.1% of employment in manufacturing and 23.1% of employment in the research and development business sector (Ženka, Slach 2017). Similar numbers are found in Hampl, Marada (2016) when – according to a different methodology – reports about 60% of the Czech population living in metropolitan areas and almost 70% of the economy concentrated. This leaves about 40% of the population and 30% of the state's economy to complement the rural areas. In the following, we discuss the relationship between the concepts of non-metropolitan and rural areas, the question of characterizing the development potential of rural areas and the issue of their typologization.

The resulting typology has already been presented to the Czech audience in the sub-article Perlín et al. (2021). This paper expands and complements only a narrow presentation of the defined types of settlements in the Czech Republic in 2021, especially with a detailed explanation of the methodology of the formation of individual factors that affect the position of each defined microregion. The results of the above-mentioned project served, among other things, as the basis for the creation of the Regional Development Strategy of the Czech Republic 2021–2027, the Concept of Rural Development, and other policy documents prepared at the national level by the Ministry of Regional Development of the Czech Republic.

2. Non-metropolitan an/or rural regions: Indicators of its external and internal conditions

The question of **the definition of rural areas** in the context of non-metropolitan areas is at the beginning of our considerations. It is proposed to identify rural areas with non-metropolitan areas. In this case, of course, we are neglecting the urban aspect, where several settlements with a rural appearance and structure will be included in metropolitan areas (these are hinterland settlements affected by intensive suburbanisation). However, from the economic and geographical point of view used for the definition of metropolitan areas, e.g., by Ženka, Slach and Sopkuliak (2017), this 'suburban countryside' fits the definition of metropolitan areas: agglomeration economies are also at work here, and these are settlements with a progressive employment structure corresponding to the metropolitan core rather than the 'traditional' countryside. Hruška and Píša (2019) confirmed these suburban settlements the dynamic growth in the number of employment opportunities, as well as their orientation towards advanced segments of the economy.

From a settlement perspective, suburbs also fit the definition of metropolitan areas. According to Marada, Komarek and Šimbera (2023), who developed the approaches of M. Hampl (e.g., Hampl 2005, Hampl and Marada 2016), metropolitan areas are characterized by a polynodal core structure that is integrated by complex bidirectional (reciprocal) commuting linkages. At the same time, core-periphery linkages are formed not only by traditional radial flows, but also by tangential relationships (for more details, see Marada, Komarek and Šimbera 2023). The internal polarisation of metropolitan regions then shifts from the evolutionarily older polarity of the mononodal centre versus hinterland to the polarity of the higher order: polynodal core versus non-metropolitan hinterland.

In this study, we choose to define rural areas as the non-metropolitan hinterland. By negation, we can arrive at their characteristics: They are areas with a low population density, a higher proportion of small settlements in the settlement structure, areas linked to core areas by hierarchical, i.e., predominantly one-way, long-distance commuting links. Rural areas are characterised by a low diversity of functions performed – usually only residential and elementary service functions are represented. The majority of jobs are located in the superior regional centre.

The typology of Czech non-metropolitan regions published by Ženka et al. (2017) is constructed differently – according to the main factors, mechanisms and actors of regional development. At the same time, the definition of non-metropolitan regions emphasises economic aspects, especially the economy of urbanisation. A rather specialised sectoral structure is cited as a characteristic of non-metropolitan regions, while metropolitan areas are characterised by a diversified economic structure. Ženka et al. (2015), in their study of Czech regions, concluded that specialisation is particularly important for the economic performance of industrial regions (including rural centres). According to Hruška and Piša (2019), it is the successful industrial sector that is behind the growth in the number of jobs in rural regions of the Czech Republic.

Spatial differentiation of the above characteristics is mostly conditioned by the quality of the geographical location or spatial polarisation (see, for example, Havlíček a kol. 2008, Bernard a kol. 2019, Marada 2001). Not only are the traditionally studied outer peripheries (borderlands) problematic, but also the so-called inner peripheries, which are usually located along the borders between regional-level administrative units, we identified. Jiří Musil (1998; later Musil, Müller, 2008) even found such regions at a time when there were minimal regional differences (a leveling regional policy of the communist regime). Hampl, Gardavský, and Kühnl (1987) made a distinction between ‘exposed’ and ‘unexposed’ regions.

The results of the long lasting development are not caused only by the complex influence of geographic, historical, political, geopolitical or economic factors, but by regionally varying **development problems** as well. Some problems are specific to urban or rural areas or to the different geographic scales of core, semi-peripheral, and peripheral areas. The more general definition of a periphery will differ significantly from the definitions based on settlement development. Regions with structural problems are such examples. They are found in areas that are undergoing the challenging socioeconomic transformation involved in converting the original economic focus of an area, for instance on mining or heavy industry, to new socio-economic activities. These regions are also typically found in Western European countries, where these conversions have been going on since the 1970s. In the Middle and East European context, these tend to be regions that inherited an inapt economic structure that was forged by central planning in the past and by what was often an ideologically determined regional specialisation on a sector (Dostál and Hampl 2002).

Structurally affected regions generally suffer from depopulation, even though they have – in settlement terms – the character of metropolises (see e.g., Marada, Komárek, Šimbera 2023). In terms of the loss of a particularly young and educated population, they are similar to rural peripheries. For example, Mills and Hazarika (2001) highlighted the problem of young people migrating from rural areas to successful cities just as they are reaching the life stage of economic independence and the problem of varying levels of access to digital services between regions (Mills and Whitacre, 2003). There is a wealth of literature on the development of non-metropolitan areas in the U.S., examining, for example, the spatial aspects of

demographic change (Johnson and Beale 1994) or changes in the spread of technology (Kim et al. 2000, Erickson 1976).

The spatial polarization of the core-periphery type is related to **imbalance in social and economic development** i.e., structural inequalities, a concentration of progressive functions, the diffusion of innovations, social justice or social reproduction (e.g., Blažek, Netrdová 2009, Novák, Netrdová 2011, Ženka, Pavlík, Slach 2017). The present study has concentrated on the structural factors that give rise to regional imbalances, which are primarily external frameworks for endogenously driven development. The quality of local human and social capital, which are frequently socio-cultural in nature, plays a pivotal role in this process (e.g., rootedness or identity – Kučera 2010, representation and perception, preferences, considerations – Chromý et al. 2011, Bernard 2011).

Human and social capital is generally considered to be a supporting or, on the contrary, a blocking factor for the success of the implementation of development policy in rural regions (see Jančák et al. 2008, Bernard 2011, Wiesinger 2007, Murdoch 2000, Svoboda et al. 2023). These studies deal with an issue of institutional quality, importance of networking in rural communities, level of education or assessing quality of social capital. Recently, there has been a new interest in rural areas in the context of electoral geography. It turns out that rural areas are often among the so-called “left behind” regions with discontent inhabitants (e.g., MacKinnon et al. 2025). This is reflected in a tendency to vote more for populist and non-systemic political parties. However, Lenzi and Perucca (2023), for example, argued that it is not economic disparities between regions, but intra-regional disparities in wealth that increase an individual's discontent.

An important impetus for the development of local activities and the weakening of global tendencies paradoxically grew out of the pandemic situation in 2020–2021 and the subsequent global and energy crises, when global flows of materials and goods were reduced and even temporarily interrupted and as a result of enhanced online connections, society became more firmly anchored in its place of residence (Bonaccorsi et al. 2020, Martin 2021).

Many of the characteristics discussed above have been used in the typology presented here (see methodological subsection).

3. Regional policy for rural development

There is relatively extensive experience within the European space in how to **approach the development of rural, peripheral, non-metropolitan areas**. Individual countries in Western Europe, however, address the problem of the development of these types of areas in diverse ways. On the one hand, an emphasis is often placed on the need to develop agricultural activities beyond conventional farming and to strengthen alternatives such as organic farming while reinforcing the importance of agriculture for the stability of the landscape (La Greca et al. 2011). On the other hand, different possibilities have been explored and then applied for the development of non-metropolitan areas by means of various alternatives to general forms of development assistance. Tools of assistance based on the ‘top-down’ principle have been widely applied by the European Union (EU) through its regional policy. After a paradigm shift in rural development (Murdoch 2000), however, a ‘bottom-up’ approach that is based on establishing development needs from the ground up – by the local community – has become increasingly more common.

Although the ‘bottom-up’ approach is now well-established in practice, its use has given rise to many new questions that need to be adequately addressed on the level of theory. In recent years, for example, we have seen the emergence of a concept of neo-regionalism (Amin 1999, Chromý, Skála 2010) and a concept of neo-endogenous development (used by Ward et al. 2005). These new concepts are essentially aimed at mobilising local actors and initiating the use of local potential from the top down by setting up framework conditions in which local actors can function. Sheppard (2002) argues that it is the activity that comes from the ‘bottom up’ that can mitigate the destructive tendencies of globalisation, while Amin and Thrift (1994) identify the local level. This level is in Czechia represented by the two types of administrative units analysed in this paper, namely municipalities with extended powers and municipalities with

an authorised municipal office as the level that is the most effective at regulating globalisation tendencies through the initiation of activities that ensure the competitiveness of a particular locality. Various 'soft' factors, which by their very nature are infinite in number and can never be precisely and comprehensively measured, can therefore yield on the local level very significant differences in the success of regions that are otherwise embedded in similar external frameworks.

A separate issue is the **creating a typology of regions**. Perlín, Kučerová, and Kučera (2010) have shown that Czechia does not have just one homogeneous countryside but rather multiple various countrysides, each of which is defined by the internal similarity of its characteristics and, conversely, the maximal external differences it has from the other types of countryside. This spatial differentiation is also confirmed by recently published typologies of Czech regions by Ženka et al. (2017) or Jeřábek et al. (2021). Characteristics used evolve and change over time, and it is therefore necessary to verify the typology and further refine it with new knowledge and new variables. As the typology of Perlín et al. (2010) was made on the basis of municipalities with less than 3000 inhabitants, we believe it is also necessary to construct a typology derived from the settlement hierarchy as a whole.

The main motivation of our research was to develop a complex typology of regions. The methodology and results of the research presented here, therefore, focus on tracing the specific characteristics and underlying conditions/potential of rural development, capturing similar or identical characteristics across regions, and providing a complex picture of spatial differences in the Czech Republic. The territory of the country as a whole is seen as a system in which it is possible to identify areas that are more or less successful. To this end, data on territorial units and their centres, including the largest agglomerations, were used. However, the focus remained on the assessment of non-metropolitan (rural) areas and the identification of opportunities and forms of support for these regions. The main objective of this paper is to present an approach to the definition of types of regions based on the consideration of both the external/structural conditions of socio-economic development and the internal preconditions for development resulting from the specific local or micro-regional activities of the inhabitants and their human and social capital. Both of these dimensions characterise the development potential of the regions assessed. We assume that a higher quality of human and social capital can help overcome the worst structural conditions of the micro-region. It is also true that several structural parameters can be improved relatively quickly through infrastructure investment, but changes in social capital are difficult to influence and change is long term. The creation of a regional typology served as the basis for our research on tools of development and recommendations for development strategies.

4. The methodology and data sources used to create the typology

The selection of appropriate territorial units, their filling with relevant data and the definition of thresholds for each type are the key methodological issues in the construction of the typology.

The choice of territorial units was influenced by the contracting authority, whose intention was to apply typology as a background for the formulation of the rural development strategy. The base layer was prepared for the administrative districts of municipalities with extended power (hereinafter MEP), which are the elementary units of government at the micro-regional level and are also the distributors of various regional support programmes. These are well-delineated units, usually enclosing substantial daily commuting movements for work, schools and major services (the exception being MEPs in the hinterland of large cities which have no natural centre). In total, there are 206 units in Czechia which has a total extent of nearly 79 thousand sq. km and a population of nearly 11 million. However, as revealed by a more detailed typology formulated at the administrative level of the 393 municipalities with authorised municipal office (hereinafter AMO), there is considerable heterogeneity inside the larger administrative units of MEP. Higher units often overlap their considerable internal differentiation. One illustrative example of significant heterogeneity within the administrative district of a municipality with extended powers is the Krnov MEP with Osoblaha extremely peripheral area. For an expert discussion, the AMO Administrative Districts offer the most insightful perspective on the variability of a region. A lower hierarchical level than AMO, in the Czech context, the level of municipalities, would not be suitable for

creating a typology, primarily because the more than 6,200 municipalities exhibit distinctive features and a high degree of variability.

The typology of regions we set out here according to their development potential considers the entire settlement system, including the capital Prague and the country's largest cities. The specific types of regions can therefore be defined directly on the basis of the relations between the core and hinterland at the macro-regional (national) and meso-regional (regional) levels.

In order to develop complex typology of regions by development potential, we needed to collect the most up-to-date data reflecting various socioeconomic viewpoints. The data were collected in detail by the municipality, which produced a database, which is a rich resource that should be of use even beyond the scope of our research project. The data on municipalities were then aggregated for higher-level administrative units: for the AMO Administrative Districts and the MEP Administrative Districts.

The very large database we created using public and non-public sources between 2017 and 2019 contains basic demographic information and population data. Much of the data came from the 2011 Czech Population and Housing Census (e.g., commuting, number of houses and flats, employment rates in different sectors etc.) and other important data (e.g., access to important elements of infrastructure in a region) came from the Czech Statistical Office's Urban and Municipal Statistics. Important data sources were from the Register of Economic Entities and from the Ministry of Labour and Social Affairs of the Czech Republic (rates of (un)employment or social benefits such as housing allowance payments and material need benefits). The level of the population's participation in a public activities and in political life in general, was assessed using election data from the Chamber of Deputies of the Parliament of the Czech Republic (2013, 2017) and municipal elections (2014, 2018). Databases of IDOS (the Czech Transport Information System) and Central Vehicle Register were also used. Some of the most interesting data came from Otevřená společnost, o.p.s., from which we obtained detailed extracts from a map of foreclosures that revealed a strong regional pattern that were more or less replicated by many other data. The database also included data on medical services, including the number of physicians in each municipality. Sorted by municipality, the database contains a total of 214 basic input and recalculated indicators.

Aggregate data which are maintained and managed by the Financial Administration Office of the Ministry of Finance of the Czech Republic, are very useful for assessing the level of economic development of an administrative unit and it can be assumed that there is significant regional variation in this across the Czech Republic. Economic performance data can be partly substituted by, for example, detailed data obtained from the area of tax revenue allocations (included in the database) or from its own calculated aggregate values.

An important aspect of the presented dataset is that it was acquired in a relatively socially calm period, and thus not disturbed by later societal events such as the coronavirus pandemic or the war in Ukraine. In particular, the impact of the ongoing conflict in Ukraine is still gradually changing over time.

We used our data to calculate numerous aggregate indicators, including commonly used ones, such as the index of population change, the age index, and the education index, and newly constructed aggregate indicators such as an index of (public) transport service and an index of economic diversity, expressed on the basis of the employment rate in individual sectors of the economy.

While the characteristics mentioned so far have been used to describe the development potential of regions, gross value added has been used to express the economic success of regions. We assumed that regions with higher location potential and quality of human capital would show greater wealth. **Gross value added (GVA)** was calculated for individual MEP Administrative Districts and the AMO Administrative Districts using public data on self-administrative regions (14 administrative units of a mid-regional level) gross value added by economic sector and with the help of the known structure of employment by sector in regions and municipalities (based on data from the Czech Statistical Office obtained in the Population and Housing Census). GVA, however, is of limited informational value because it ignores differences in the contributions from individual sub sectors/industries within a sector (e.g., sub sectors within

the category of the manufacturing industry). However, in the absence of more precise financial indicators on the performance of lower administrative units, even this more general assessment is necessary.

Both individual and aggregated indicators were subjected to a verification process in terms of their spatial distribution (cartographic analysis) and correlation. The findings of this process informed the final selection of typological characteristics, which were chosen to represent the primary distinguishing features of metropolitan and non-metropolitan regions, while avoiding excessive mutual correlation.

The statistical method employed to construct the typology was a factor analysis, which was used to elucidate the variance of the observed variables through the introduction of a smaller number of latent variables. Following Marada's methodology (2001), we constructed two "dimensions" of regional differentiation: the 'outer' factor, which considers both the size of a settlement and its position in relation to the main settlement cores, and 'inner' factor representing the quality and stability of the human capital in regions.

Two explanatory remarks are necessary on the concept of factors. Firstly, the term 'outer' is employed in order to evaluate the conditions of individual MEP/AMO regions in relation to the values observed in other MEPs/AMOs within the national system. Therefore, the characteristics used refer to the rank of the MEP/AMO region within the country. It is therefore possible to speak of the geographical location quality or the exposure of the region. The inner factor characterises the internal conditions in a somewhat narrow manner, in terms of soft factors, rather than, for example, the quality of schools or the local innovation base. In the case of both factors, we are neglecting the international context. The impact of a region's overall position and the influence of neighbouring cross-border regions are not directly addressed in the national typology. However, these effects are indirectly reflected in analysed indicators. In particular, traditional barriers, including language skills, persist in western border regions (Svoboda, Komárek, Chromý, 2023).

From the entire set of prepared variables, several dozen variables were selected for which there was a realistic assumption that they could significantly explain either potential differences of an internal nature or of an external nature. Synthetic factors were then created for both groups of variables using two-factor analysis, each for different variables. For future evaluation (and the possibility of logical interpretation of the result), it was decided that in factor analysis, only one synthesizing factor with the highest degree of explained variability would be used.

The two-factor analysis identified two principal factors, which were saturated with, respectively, four and five of the original input variables. The "outer factor" was extracted from the following characteristics:

- Functional size per capita – the weighted number of jobs and school places relative to the size of the population in an administrative unit. The indicator underscores the service function of a place, and not just the residential function, and it therefore has a hierarchical distribution.
- The share of the population that lives in small municipalities (up to 250 inhabitants), which measures the level of settlement fragmentation in the administrative unit and especially assesses the character of its rural hinterland.
- The index of economic progress is constructed as the differentially weighted shares of employees in different sectors of the economy: the primary (1) to quaternary (4) sectors. The values of this index are thus higher in regions with a more progressive employment structure, i.e., with a higher share of tertiary and quaternary industries/sectors of the economy.
- The diversity of the economy's structure, which was determined by assigning scores for the share of employment in twelve sectors of the economy. We set out from the assumption that regions that have a diversified economy are less vulnerable to rising unemployment during economic crises than are regions with a unilateral economy. The index values are higher in places where there are more diverse employment opportunities across the twelve economic sectors assessed. The index values are lower in regions where there is one dominant sector – for example, the automotive industry in the Administrative District of Mladá Boleslav. This is a developed region, but the lower index values are fitting, because if the automotive industry was hit by

a crisis, the negative impacts on the region would be more pronounced than they would be in regions with a diversified economy. Although, for example, Kemeny and Storper (2015) disputed the benefits of specialisation for smaller and less exposed regions, we considered the aforementioned approach to evaluation in a nationwide systematic view to be appropriate.

The second factor, called an 'inner' one, encompasses the following characteristics:

- An education index, which is constructed from the differentially weighted shares of the population by educational attainment, where the population segment with higher education is distinguished by a higher index value. The index values are higher in places where the population is more educated, and the index therefore has a marked hierarchical distribution.
- Unemployment was expressed as the number of registered unemployed out of the total size of the economically active population in the region (these data were drawn from the Ministry of Labour and Social Affairs).
- The level of entrepreneurship among the population, which was measured as the share of economic subjects in the region registered in the Business Register (RES) out of the number of economically active inhabitants in the region.
- The share of the population in a region in foreclosure, which was measured as the share of the population with at least one foreclosure out of the total population in the region (data obtained from mapaexekuci.cz).
- The share of voters of non-systemic parties, which was determined from a statistical database of the Czech Statistical Office ([server Volby.cz](http://server.volby.cz)) and represents the number of voters of non-systemic extremist parties in the 2017 parliamentary elections out of the total number of eligible voters in a given administrative unit.

The factor extracted from the first factor analysis ("exposure") explains 49.9% of the total variability of the population. Both Bartlett's test of sphericity and the KMO test showed favourable values, i.e., significance close to zero, namely 0.675. In the case of the second analysis, the factor ('human resources') explains 58.2% of the variability in the population. The Bartlett's test of sphericity and the KMO test reached similar values to the first factor (close to zero and 0.757, respectively). The strength of the effect of these factors in an administrative unit is indicated by a factor score. Based on these scores, we find that the first factor, representing external conditions, has a positive effect in administrative units that have a high per capita functional size. These are cities where the number of jobs and school places exceeds the number of residents. This factor also has a positive score in regions that have an advanced and diversified economic structure. At the same time, the micro-regions we analysed have a smaller share of inhabitants living in small municipalities. With a degree of generalisation, we can say that these are densely populated regions. The second factor representing the internal conditions of development (i.e., unemployment) has high positive factor scores in administrative units where there are higher levels of education and entrepreneurship and, conversely, lower unemployment and a lower tendency to vote for non-systemic parties and in microregions that have a lower per capita foreclosure rate.

Based on this two-factor construction, the factor scores can be plotted in a dual-axis framework of coordinates, where each administrative unit is represented by a point and its position in the graph is determined by the factor scores along the two axes. Regions with similar external and internal conditions are clustered tightly together in this graph. Based on this determination of the position of territorial/administrative units, we divided the analysed regions (MEP Administrative Districts and AMO Administrative Districts) into four basic categories according to their position in one of the graphs' four quadrants and to define as a fifth type those MEP Administrative Districts (or AMO Administrative Districts) that are located near the centre where the two axes intersect at the values of 0 and 0. Given that this set of points as a whole leans significantly (almost doubly) in the direction of positive values (in the 1st quadrant), the centre of the system also leans towards positive values, and those regions that are located within an interval of +0.6 and -0.3 from the zero value of both coordinates will be designated as undefined regions.

A schematic division of administrative units into individual types is presented in Fig 1.

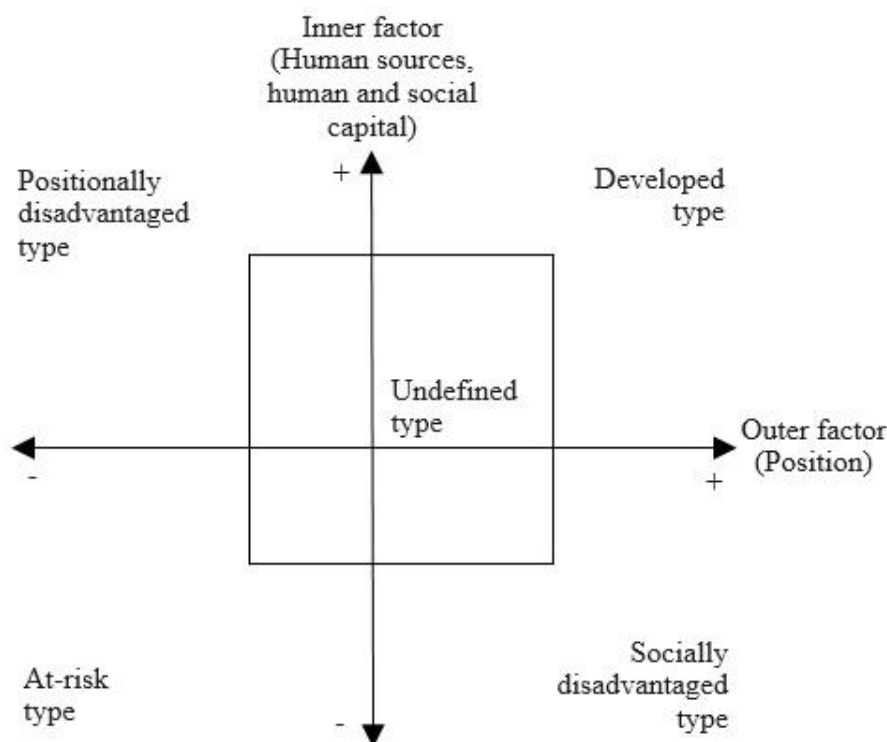


Fig 1. The division/classification of potential types by their factor scores. Source: own results

5. The resulting typology

The results of the divisions of MEP and AMO Administrative Districts into types according to their development potential are presented in Figures 2 and 3. In conformity with the methodology we set out, the entire territory of the Czech Republic was divided into five types of settlement.

Both the internal and external conditions of development are found to be very good in the case of a type of micro-region that has positive internal and external potential. We call this type of micro-region the 'developed type' (49 MEP Administrative Districts and 64 AMO Administrative Districts belong to this type). In this type, we mainly find municipalities that are located in the metropolitan hinterlands of the main settlement centres, but we also, for example, find here the Orlické Mountains foothills district and areas around traditional and large villages located in the Zlín and Uherské Hradiště Regions.

A more detailed analysis according to AMO Administrative Districts, however, reveals relatively significant heterogeneity across the units in the Orlické Mountains foothills district. In many other areas, the quality of the hierarchically lower-order settlement units, conversely, can be observed – for example, near towns Domažlice, Písek, in Podkrkonoší, and South Moravia, and the long-term improving position of more important centres in the Vysočina Region.

The 'developed type' is commonly found in the metropolitan or suburban hinterlands of regional centres.

The second type is called the 'socially disadvantaged type' and is made up of micro-regions at the levels of the MEP Administrative Districts and the AMO Administrative Districts that have better external situational potential, that is, they have a dense population with a network of larger towns, but a lower quality of human capital, expressed as lower internal potential (29 MEP Administrative Districts and 45 AMO Administrative Districts fall into this type). If we make a gross simplification, this type can be characterised as a type whose natural endogenous development is impeded by a lower quality of human capital and by social problems, despite its relatively favourable location. Geographically, this type is represented by most of the Ústí nad Labem Region and also part of the Mělník and Rakovník Regions, in an area structurally similar to the area in the Moravian-Silesian Region east of Ostrava, but also in areas

repeatedly defined as economically weak and often with long-term unemployment – in the regions of the Mikulov, Břeclav, and Hodonín MEP Administrative Districts and in the Jeseníky Region.

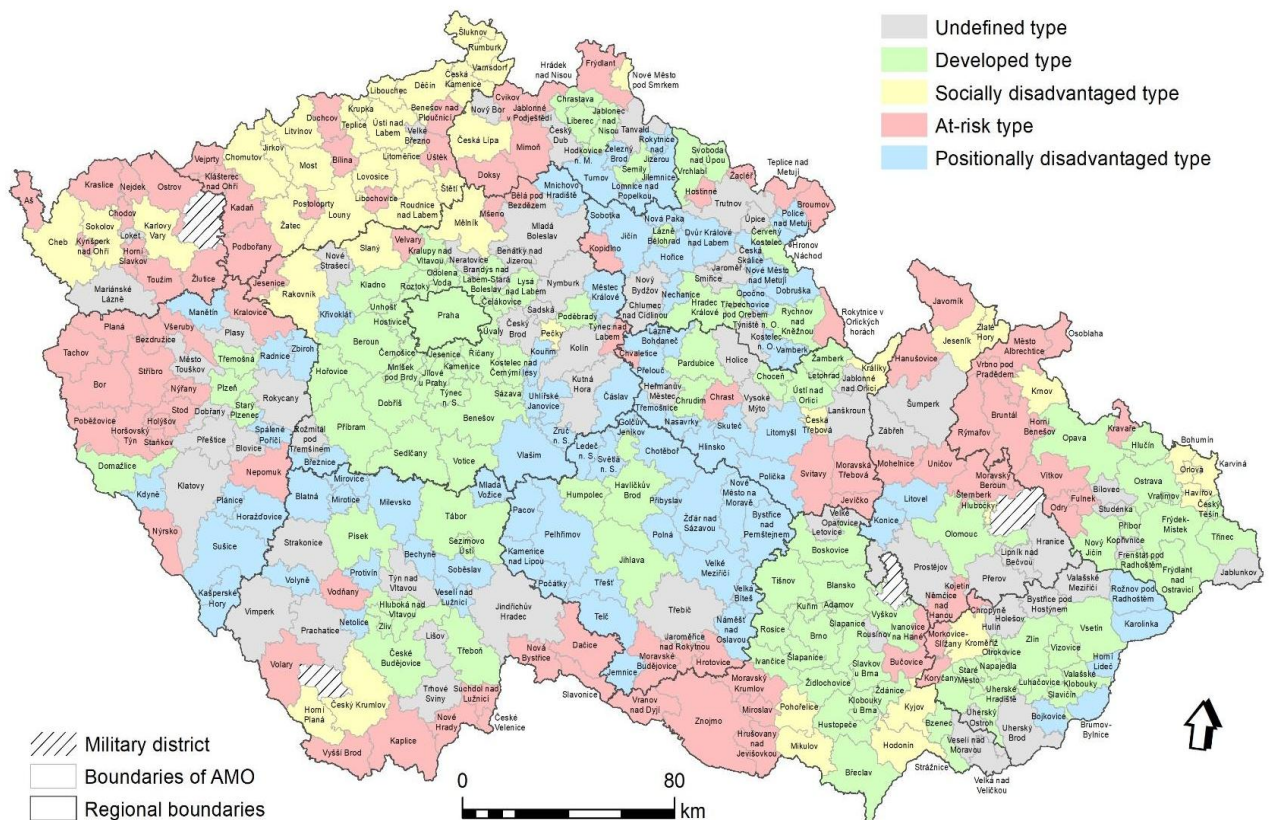


Fig 2. Typology of the divisions of MEP. Source: own results

When we look at the level of AMO Administrative Districts, we find that the socially disadvantaged type is relatively homogeneous, and only in the Karlovy Vary Region, there are there some AMO Administrative Districts that belong to this type, but within the MEP Administrative District as a whole, they have somewhat different characteristics. A whole range of AMO Administrative Districts in South Moravia, however, lie on the boundary between this and the developed type and thus form a kind of transitional type.

The socially disadvantaged type is mainly found in structurally disadvantaged regions and to some extent economically weak regions as well.

Another defined type is the ‘at-risk type’ (comprising a total of 45 MEP Administrative Districts, 97 AMO Administrative Districts), where the factor scores of both synthetic variables are negative. The name ‘at-risk type’ implies genuinely poorer locational and social conditions for quality of life. This type is mainly found in peripheral border areas that experienced the displacement of the indigenous population (after WWII) and (insufficient) population resettlement since then. As already demonstrated in the work of Musil and Müller (2008), Perlin, Kučerová and Kučera (2010), Jančák et al. (2008, 2010), Bernard (2011), Chromý et al. (2011) and others, in our typology, we find that even more than 70 years later (post-war) population displacement is still a significant factor – primarily in terms of social conditions. This type is found across the almost continuous stretch of area formed by the Karlovy Vary, Cheb, and Tachov Regions, as well as in the southern part of the Šumava District and in the Česká Kanada District in the southern Vysočina Region. Similar characteristics are also found in the Jeseníky District and the mountain foothills there. The boundary outline of this type closely copies the boundaries of the distribution of the original German population. This type is found within the Moravian inner periphery that borders between the catchment areas of Brno and Zlín regions in the area of Chřiby and Žďánice Forest, where settlement is dispersed and there is a weak economic base.

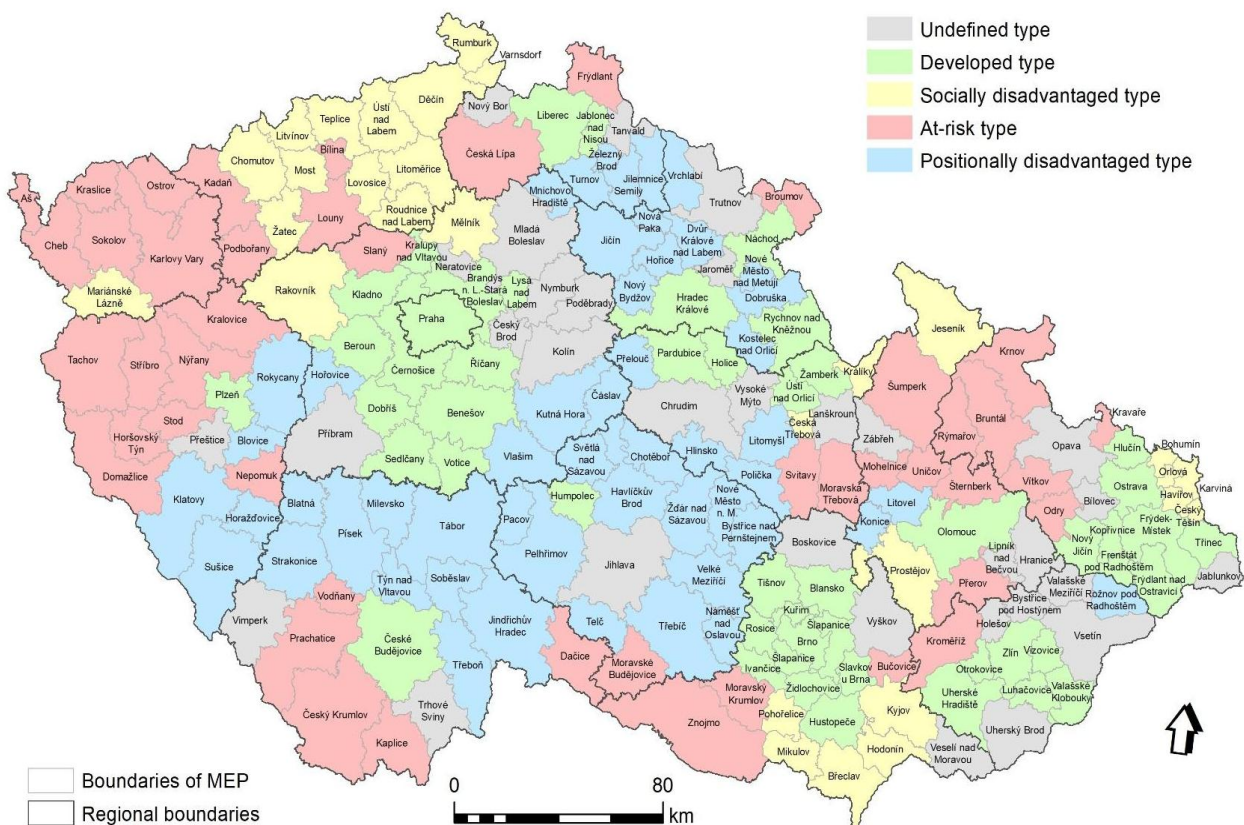


Fig 3. Typology of the divisions of AMO. Source: own results

When we look for more detailed (at a level of units lower in the settlement hierarchy (AMO Administrative Districts)), we find this type is much less widespread, which is indicated primarily by the significant internal differentiation of MEP Administrative Districts. This is especially apparent, for example, in the Karlovy Vary Region, where AMO Administrative Districts that contain larger cities belong to a different type, while the rural regions still rank as 'at-risk' areas. Conversely, even in areas that at first glance seem stable it is possible in some places to find among regions that have the characteristics of the 'at-risk type'. One example of this is the Kopidlno AMO Administrative District in the Jičín region, a region that has a very weak centre and social problems and that forms an important inner periphery on the border between the Central Bohemia and Hradec Králové Regions. This type is mainly represented by rural regions located in areas that used to have a German population.

The last distinct type is the 'positionally disadvantaged type' (51 MEP Administrative Districts, 82 AMO Administrative Districts). The quality of human capital in these districts is relatively high (sometimes close to that in the first type – the developed type), but these districts are generally not in an exposed location. In simple terms, it can be said that the inhabitants in this type tend to be relatively successful despite the area's disadvantaged location. This type is found across a relatively continuous stretch of area running from the Šumava Region near Plzeň and along the southern and eastern borders of the Central Bohemia Region (inner periphery), with a noticeable extension into the Vysočina Region, and extending as far as northeastern Bohemia. It can with a certain degree of imprecision be approximated as corresponding to a traditionally defined inner periphery (Musil 1988).

When we take a closer look, at a lower level in the settlement hierarchy (AMO Administrative Districts) we find the situationally disadvantaged type is frequently mixed (together) with the developed or undefined type, while this differentiation further demonstrates the high degree of internal heterogeneity on the territory of the MEP Administrative Districts. This type also appears, for example, in Moravian regions along the border with Slovakia, places where the influence of the major Moravian centres is weaker.

The positionally disadvantaged type is typically found in traditional Czech and Moravian rural areas with stable populations.

Another specific type we established was the 'undefined type' (a total of 32 MEP Administrative Districts, 64 AMO Administrative Districts), which was created by marking off the factor scores of micro-regions located on the continuous scale around the centre of the system as the centre/core of the set in the range between the factor scores of -0.3 and +0.6 along both axes. Among the actual units with this definition, this type is generally characterised as having a strong (formerly district) centre and a large rural hinterland. This type no longer follows a continuous regional pattern and is now represented more by strong regional units (located) in an otherwise rural area space that within a national sample tend to have medium values, but where relatively large differences may exist between the core of the micro-region and its rural hinterland.

When we look at the AMO Administrative Districts, we can see that while the undefined type is detected at a higher level in the hierarchy of administrative units, i.e., at the level of the MEP Administrative Districts, a closer look reveals three and in places even four different sub-regions of AMO Administrative Districts reveals the presence of three or sometimes four different types of regions within a AMO Administrative District. For example, in the Kolín MEP Administrative District, which is an undefined type, we find the socially disadvantaged Pečky MEP Administrative District, the positionally disadvantaged Kuřim MEP Administrative District, and the at-risk Týnec nad Labem MEP Administrative District, while the municipality of Kolín itself and its immediate hinterland remain undefined. This type includes the large undefined regions found mainly to the north of Kolín (the Poděbrady, Nymburk, and Mladá Boleslav regions) and in central-eastern Moravia. A more detailed breakdown reveals that this type can be found almost throughout the Czech Republic, except in the Prague and Brno metropolitan areas and the Vysočina Region, where in simplified terms it can be stated that the dominant micro-regional centre either helps the entire region, through its work to break out of overcome belonging to the at-risk type, or, conversely, through its inertia, it prevents the area from emerging as a developed or, conversely, positionally disadvantaged type.

6. Conclusion

The typology of regions that this paper sets out on two different levels of the settlement hierarchy, namely MEP Administrative Districts and AMO Administrative Districts, offers a comprehensive picture of regional differentiation within the Czech Republic, with special focus on non-metropolitan areas and the different problems and conditions of regional development. The typology builds on earlier studies that defined (rural) areas, such as those by Perlín, Kučerová, and Kučera (2010), Musil (1988), and Musil and Müller (2008).

Two complex factors that are aggregates of multiple sub-factors were used to define different types of regions. The main factors used in the typology were an outer factor (simplified as location) and an inner factor (simplified as soft factors). Five types of regions were then defined based on factor scores plotted on a two-axis chart. The first type was defined as the 'developed type'. This type had positive values for both the external and inner factors and it represents a more metropolitan area. The second type (socially disadvantages) represents regions that have positive location factors but negative values for inner factors. The third type (positionally disadvantaged) is characterised by positive soft factors and negative positional factors. The fourth type (at-risk regions) has negative values for inner and outer factors and represents a 'typical' at-risk non-metropolitan area with an insufficient level of regional development. In the fifth and last type (undefined regions), all the factors are relatively neutral, and these are largely regions that have a strong core and relatively little diversification in their economic activities. The second to fifth types are non-metropolitan areas, and these should be devoted greater attention in regional development policy. It is at the same time necessary to remain aware that a specific approach (including different development instruments) needs to be applied to each different type.

The typology of regions presented in this paper intuitively corresponds to a geographic assessment of the Czech Republic in which the developed type of region corresponds to successful metropolitan areas,

the socially disadvantaged type to problematic metropolitan areas, the at-risk type to the outer peripheries, and the positionally disadvantaged type to inner peripheries. The authors of this typology of regions are aware of the limitations of the evaluations made, which include, for example, the unavailability of certain data, the omission of any attention given to the direct importance of location in relation to foreign countries (and the specific position of the Czech Republic in relation to Western and Eastern Europe), and the need for public administration to work with higher-level administrative units. However, the resulting typology, which, as well as a traditional differentiation between territories based on geographic location, i.e., a division into core and peripheral areas, introduces the quality of soft factors as a new dimension into the assessment, and offers a better picture of not just the problems but also the needs of individual types of regions. It is the quality of human capital (and more broadly, the social environment) that appears to be key, which is consistent with findings from a number of other studies already conducted (Blažek, Netrdová 2009, Bernard et al. 2019, Ženka et al. 2017). While the physical remoteness of a territory can be addressed with the aid of relatively cheap and fast infrastructure measures in regional policy (support for internalization, strengthening transport services, increasing the capacity of transport infrastructure, etc.), the quality of human capital in a territory and the regional environment can only be changed at a very slow pace (through 'soft' measures such as requalification courses, methodological support, continuing education for teaching staff, support for the development of civil society, etc.). It is also difficult to overcome social capital's negative effects, such as corruption, inefficient investment that is not in the interests of development but in the interests of investors, etc., or the higher degree of bonding social capital that is associated with the rootedness of communities in a territory and with their limited ability to innovate, etc. It is therefore necessary to devote more research to these problems as they relate to each type of region, drawing on the potential of qualitative research (through interviews with/surveys of residents) and research into the effectiveness of regional policy instruments on the ground. Without these direct findings, any typology of regions that is based on an analysis of statistical data, can be nothing more than just a formal framework.

The typology of regions proposed in this paper serves as a good foundation from which to design and apply spatially differentiated approaches that the state and regional public authorities can employ to create specific development programmes and define regional development instruments. These should all be tailored to the specific regions and their needs. Using this instrument as opposed to applying the same instruments universally across a whole territory, makes it possible to be more precise, and therefore more effectively, define forms and instruments of support that either work to directly resolve unwanted problems that increase the differences between regions beyond an acceptable level or serve to facilitate processes and activities that strengthen the position and performance of regions on the basis of a territory's clearly identified internal resources and needs.

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