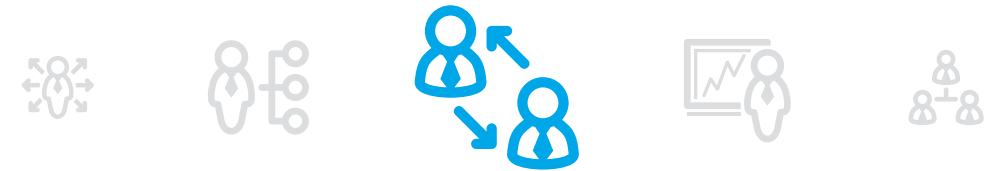




ISBN 978-83-952923-0-9



LABOUR MARKET AS A KEY DETERMINANT OF HUMAN RESOURCE DEVELOPMENT IN THE REGIONS OF THE VISEGRAD GROUP



Eva Koišová, Jozef Habánik and others



Centre of Sociological Research
Szczecin, Poland, 2018



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Approved as a monograph in the 2018 Editorial Plan by the Editorial Board of the Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín.

The authors are fully responsible for the professional and linguistic aspects of the publication. The monograph has not been edited.

First edition, 2018

Centre of Sociological Research

Szczecin, Poland

ISBN 978-83-952923-0-9

EAN 9788395292309

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INTRODUCTION

Common historical, social, cultural, political and economic conditions have encouraged the formation of the Visegrad Group. This group reflects the effort of CEE countries to cooperate in several areas of common interest in terms of Pan-European integration. It is a grouping of regional cooperation of four Central European countries: the Czech Republic, Hungary, Poland and the Slovak Republic (Visegrad Group, 2012). Economic development in individual countries of the Visegrad Group has its own specificities. Nevertheless, it is still possible to identify a common development trend. Regional disparities result from economic, social and structural changes, infrastructure, geography and capability of regions as well as their differing ability to gain competitive advantages and eliminate possible negative consequences of reforms.

The goal of the economic policy of developed countries is to increase the standard of living and welfare of society, which cannot be achieved without balancing the levels of individual regions. That is why regional policy is a key area of an economic policy. Its role is to ensure the development of regions, to mitigate their excessive inequalities in development, with an emphasis on efficient use of region's own resources. The exploitation of the territory's potential is a basic starting point for the social and economic development of regions and a condition for changes that will lead to a new higher quality of life and competitiveness of region. The Europe 2020 strategy is designed to create the conditions for smart, sustainable and inclusive growth. Compared to the previous European Union (EU) strategies, inclusive growth has been the key theme to minimize long-term unemployment and reintegrate the long-term unemployed in the labour market and society, reduce poverty and social exclusion, and increase educational attainment of the EU citizens.

The present scientific monograph aims to examine the impact that the selected factors have on regional development and effective regional policy in light of human resources in the Visegrad Group. The structure of the monograph and the presentation of theoretical scientific knowledge, trends and research outcomes all contribute to the current understanding of the specificities of the regional development in the V4 countries. Thus, the

monograph explores the current issues of the subject matter and presents the research and analyses carried out by the authors.

With regard to the structure of the monograph, the authors have focused on the content, encompassing theoretical postulates related to regional development and regional policy in the context of the development of human resources in the labour market. The first two chapters define the core concepts and EU policies related to regional development and labour market while drawing on the scientific debates and conclusions of foreign authors. The next chapter discusses the factors that underpin inclusive growth in terms of employment and poverty. In the chapter, the situation in the regions of the V4 countries is analysed with regard to the rates of poverty, unemployment, participation in education and training. In addition, the employment trends in relation to educational attainment are also covered. The following chapter attempts to analyse the selected factors that support the labour market-related smart, sustainable and inclusive growth in the NUTS 2 regions of the V4 countries. Thus, the development of the economic performance of the V4 regions in the indicators such as per capita GDP is monitored and compared. Moreover, the differences in employment and household incomes are. Social area is monitored through the indicators of people at risk of poverty and social exclusion, participation rate in education and training, fertility rate, infant mortality rate, and life expectancy. Since smart growth also relies on the level of investment in science and research or household Internet access, these factors were paid attention to. Environmental aspects were examined through waste production. Chapter six compares and evaluates the differences in the indicators monitored among the V4 regions. The scoring method and cluster analysis were employed to compare the regions. The final chapter discusses suggestions and policy measures to enhance regional development.

All the analyses and solutions are based on the results from the VEGA project No. 1/0233/16 entitled Dimensions and Factors of Social and Economic Development of the Regions of the V4 Countries.

Authors

1 INTRODUCTION TO REGIONAL ECONOMICS AND REGIONAL POLICY

Regional economics is a relatively new sub-discipline of economics. When examining the issues related to regional economics, the theory behind the sub-discipline needs to be explained and the relationships, connections and interactions among the concepts need to be defined.

For regional economies to perform well, effective regional policies need to be in place. Regional policy can be understood as a process integrating the economic policy system at micro and macroeconomic levels through its tools and indicators as well as in the regional economy environment. In general, regional policy refers to conceptual and purposeful activities seeking to eliminate the negative effects of uneven territorial development and structural changes. (Habánik, Koišová, 2011)

Since structural changes do not bring about the same effects on the regions in a particular country, big disparities among regions may occur. It is the regional policy that attempts to mitigate such disparities. Thus, the focus of regional policy becomes an area with internal and external connections, and unique characteristics and features. Such an area is frequently referred to as a region.

1.1 Meaning and definition of the notion of region

There is no single definition for region. The term has been treated by several scientific disciplines with common application in for instance geography, economics, sociology, and each discipline has their own definitions and meanings that are appropriate for the concept. There are several definitions of the notion of region even under one research discipline.

1.1.1 Region as a basic spatial unit

A defining element of the term region is the geographic aspect, which as noted by Výrostová (2010), is the basis for its definition and the purpose for which the region is to serve. According to Samson et al. (2001), a region refers to natural borders, which determine filling up of spatial units by specific productive, non-productive, educational, cultural and other elements of life. Thus, in accordance with Bašovský and Lauko (1990), a region can be defined as a complex dynamic spatial system existing on the Earth's surface owing to the interaction of natural and socio-economic phenomena. Geographic view on the term can also be found in the definition of Buček and other authors (2010) who define a region as a unit smaller than a country, yet larger than an urban area.

Regional economists define a region as a "territorial and spatial unit with a clear basic socio-economic system, which can be precisely delineated in space by means of one or several features. A region can be defined in terms of relationships – by merging territories with strong interrelationships or in terms of homogeneity – by merging homogeneous territories in line with selected features or functions. The socio-economic system is not located in any abstract space, yet it is delineated as a part of a concrete environment with which it is interacting" (Hančlová and Tvrdý, 2004). Křižanová (2012, p. 50) defines a region as an area (part of the landscape sphere) that differs from neighbouring areas (or other territories) by a set of features, conditions and effects.

Habánik and Koišová (2011, p. 108) note that a region refers to a spatially bound system of variables with an interdependence stronger than other variables have. The same authors view a region as a subsystem of the state spatial system or as a structured unit characterized by economic, geographic, social, cultural, historical, national and other features. Simultaneously, they note that the way of thinking about a region as an area is not comprehensive enough. Delineating a region as a socio-economic unit requires to identify its economic capability, administrative organization, institutional set-up, and to consider other factors related to the development of the region.

An economic view on the region is prevalent in the definition by Belajová and Fáziková (2005), who perceive a region as an area with a certain principle of arranging mutual activities and links among economic units (companies), human and natural potential as well as infrastructure.

In line with the aforementioned, one needs to understand that economic activities are formed, and are increasing and developing in a certain space. Firms and economic actors in general, choose their locations in the same way as they choose their production factors and their technology. Productive resources are distributed unevenly in space: they are frequently concentrated in specific places (regions or cities) while they are entirely or partly non-existent in others. Quantitative and qualitative imbalances in the geographical distribution of resources and economic activities generate different factor remunerations, different levels of wealth and well-being, and different degrees of control over local development. (Capello, 2009)

That is why uneven economic activities lead to different geographic and natural conditions that are not equally favourable to all economic activities. (Tvrdoň, Hamalová, Žárska, 1995) This brings about differences among regions. As a result, regions differ from one another, which implies the need for the classification of regions on the basis of different characteristics or views. This process is known as regionalization. Lauko (1982) regards regionalization as a process of defining territorial units that have certain feature(s) and their separation from those which are lacking them. Thus, various typologies and classifications of regions were elaborated.

1.1.2 Regional typologies and classifications

There are several regional typologies taking into account various criteria. Some of them are dealt with in the text below.

The European Regional Planning Charter of 1983 (In: Výrostová, 2010) distinguishes rural regions, urban regions, border regions,

mountain regions, structurally weak regions, coastal regions and islands. Next, Výrostová (2010) note that regions are classified into:

- *open regions* – playing a leading role in a national economy,
- *partially adapting regions* – losing their development capacity due to declining major industries,
- *lagging regions* – not possessing enough capital and resources, thus their productivity, demand and consumption are going down.

Ivanička and Ivaničková (2007) classify regions into the following groups:

- *homogenous regions* are delimited based on a dominant physical factors,
- *multi-element homogenous regions* (also group or cluster regions) in which natural conditions come before the indicators of economic and social development,
- *nodal regions* are delimited through the relations resulting from economic, social and spatial activities in particular areas.
- *development regions* utilize growth poles that identify entire industries or their parts of pronounced economic trends. Their effectivity is the key to social and economic growth.
- *planning regions*.

In order to implement the activities of regional support and regional policy, regions should be classified into (Buček et al., 2010):

- *developed regions* whose key mission is regional development. *Developed regions are able to* continuously adapt to changing conditions on the labour and goods markets. Thus, they are attractive to domestic and foreign business investment. They are considered to be the stabilizers of reform processes, and they are indicative of the impacts of reforms on the entire nation.

• *problem regions* suffer from long-term negative effects on regional economy. They are known for slow growth, income inequality, high unemployment rates and population decline. The reasons why regions lag may be including companies that are not competitive enough, inadequate human resources and infrastructure, distance from markets, external decision-making and outdated sectoral structure. Výrostová (2010) breaks down problem regions into *lagging regions* having the under-average factors of production, low utilization of natural and human resources, below the average income and GDP per capita. Another type of problem regions are *structurally weak regions* which were once developed regions. Yet, their economic growth is slowing due to fast technological advancements. Structurally weak regions are not flexible enough or their structural changes are slow. These are predominantly regions with traditional industries, such as mining or heavy industry. Problem regions also include *congested regions* which can be mainly found in advanced economies. Congested regions are known for high concentration of economic activity. Concentrated economic activity makes the costs of technical and social infrastructure grow. There are also problems with the preservation of the quality of the environment and traffic.

The classification of regions in terms of their competitiveness was dealt with by Martin (2003). The European Commission (2016) defines regional competitiveness as the ability of a region to offer an attractive and sustainable environment for firms and residents to live and work. Martin's (2003) regional typology is based on taking into account two key criteria:

- population density – shows the urbanization of regions,
- gross domestic product per capita, especially its sustainable growth over a longer period of time.

Černáková (2012) argues that Martin's criteria are based on several theories on regional typologies, mainly those of economic geography, given that a spatial dimension is indispensable to understanding regional competitiveness. The spatial dimension in Martin's typology is represented by population density. The second criterion, i.e. the ability

of sustainable GDP growth per capita over a longer period of time, is a must for productivity growth in regions. Thus, three basic types of regions are distinguished:

- production sites;
- knowledge hubs;
- sources of increasing returns.

Production sites are characterized by low to medium income levels. Their main sources of productivity are predominantly cheap inputs. The determinants of competitiveness lay primarily in basic infrastructure and accessibility, such as housing, permeable transport and availability of human resources at a low cost. These are the factors that attract low-cost production and direct foreign investment. Due to the relatively low economic dynamics, the regions are not endangered by disadvantages related to urbanization.

Knowledge hubs are characterized by high population density as well as high and sustainable GDP growth. Such regions can be found in large urban area. Being the centres of education and information, these regions are open to international activities that provide better opportunities for career development and competitive supply and demand. They are known for profound research and development, entrepreneurial and patent activities. Nevertheless, the regions suffer from urbanization problems, such as high labour costs, traffic congestions, high housing costs and crime rates. Despite the problems of urbanization, knowledge hubs are expected to possess excellent quality of human resources, access to international markets, information, risk capital, services, cultural facilities, and so on.

The *sources of increasing returns* are distinguished by average population densities and a pronounced economic structure. They are also referred to as *dynamic regions*. Dynamic regions mainly engage in those areas of economy that are significant sources of wealth. The key factors to their competitiveness are mainly high qualification quality of human capital, division of labour among enterprises, market size and accessibility to suppliers. (Černáková, 2012)

For the needs of public administration and local government, *administrative regions* are defined. Administrative regions should respect natural conditions, socio-economic relations as well as the residents' sense of belonging based to a large extent on shared history. Therefore, the boundaries of natural regions should also be taken into account as well as political and other factors. (Výrostová, 2010) Administrative regions are territorial units with clearly defined boundaries that are distinct from local government boundaries. Administrative regions perform administrative tasks in line with clearly defined competences. Administrative regions were established by the central government taking the form of functional regions in order to provide one or several administrative services. (Maier and Tödtling, 1998)

Classification the territorial units for statistics in EU

A common classification of territorial units for statistics (NUTS) is important for statistical purposes in order to harmonize the national statistics at EU level. The NUTS classification is a hierarchical system for dividing up the economic territory of the European Union for the purpose of statistical socio-economic analyses of the regions and framing of the EU regional policies.

NUTS can ensure the data comparability during the processes of data collection, transmission and publication of national and EU statistics. The Nomenclature of territorial units for statistics, abbreviated NUTS from French language, is a geographical classification of the economic territorial units of the national territories of EU Member States into three different levels of regions, from larger to smaller. For defining a NUTS territorial unit, the delimited geographical area must have an administrative authority, which is legally and institutionally acting in the Member State. There were established the following thresholds of residential population, in Table 1.1, in order to ensure the regions comparability in terms of population size. The NUTS administrative units of a Member State have a lower and an upper limit of an interval of the residential population in that area. (Polgár and Duguleană, 2015)

Table 1.1 Intervals of population for NUTS classification

NUTS level	Minimum limit (pers.)	Maximum limit (pers.)
NUTS 1	3 million	7 million
NUTS 2	800,000	3 million
NUTS 3	150,000	800,000

Source: Polgár and Duguleană, 2015

The NUTS classification from 2013 which is considered in EU starting with 1st of January 2015 is recording: 98 regions at NUTS 1, 276 regions at NUTS 2 and 1342 regions at NUTS 3 level.

The term region is also used in a broader sense with regard to the spatial dimension (Maier and Tödtling, 1998). In terms of spatial areas, three types of spatial units can be distinguished, such as *subnational territories* (incl. natural regions, administrative regions and regions according to NUTS classification, except for LAU 2, micro-regions and purpose regions), *supranational territories* (e. g. Visegrad countries, Benelux countries, Baltic region) and *transnational territories* (e.g. Euroregions which are made up of border areas of at least two countries with a shared border. The main purpose of Euroregions is cross-border cooperation. Cross-border cooperation involves collaboration between adjacent areas across borders.).

The NUTS classification ensures harmonized standards in the collection and transmission of data on regions. When necessary, the EU Member States may also use LAU 1 and LAU 2 levels. (Výrostová, 2010)

The regional statistics is based on NUTS classification. The socio-economic analyses based on NUTS classification offer objective bases in defining the geographic eligibility for EU funds. The regional statistical indicators are important in evaluating the efficiency and the impact of EU funding to increase the standard of living and alleviate disparities between urban and rural area. Depending on the regional GDP per

inhabitant (in PPS) as yearly or average over a period, the NUTS 2 regions are ranked and grouped as less developed regions, having:

- GDP/inh. < 75% of the EU average; transition regions with:
- 75% < GDP/inh. < 90% of the EU average;
- more developed regions, having: GDP/inh. > 90% of the EU average.

The rural regions can be analysed with data available at NUTS 3 level, by calculating aggregate indicators by type of regions, in order to emphasize the differences between the types of regions or to evaluate the analysed indicator for the predominantly rural regions. The problems for rural development statistics are in the predominantly rural regions, about the higher unemployment risk, about the ageing of labour force and of population, the development of different activity sectors. (Polgár and Duguleană, 2015)

These data are important inputs for the analysis of implemented policies, especially in terms of monitoring the development of regions, towns and villages.

1.2 Definition of regional economics and policy

Regional economics and politics are an integral part of the processes going on in society. They affect social reality and sustainable social and economic development of regions.

1.2.1 Regional economics

Regional economics should be viewed as the blend of cross-sectional, spatial and municipal economics. Therefore, regional economics and public economics are interrelated and continuous processes at all levels of the public sector.

Therefore, regional economics should focus on tackling:

- The connection between the government and local governments (relations between economic entities),
- enhancing the functionality of regions and locations as relatively independent entities,
- interregional and intraregional relations.

Regional economics is a complex and dynamic system of entities, factors, resources and tools interacting with one another independently, yet in a coordinated and gradual manner.

The economic and social structure of regional economy mirrors the sectoral composition of national economy.

The economic base of regional economy is either one-sided or diversified. A diversified base mitigates potential growth, development or cyclical risks. Thus, regions are more resistant to external factors and pressures on environmental stability. In a one-sided economy, one or two sectors of economy prevail and give jobs to a large number of people. Such an economic structure puts stable growth in danger, especially when trends in the markets are not considered. These aspects are the subject to regional economic analyses that address structural changes while applying qualitative and quantitative theories, micro and macroeconomics, spatial analysis, spatial development and regional information systems.

Regional economics is a branch of economics which incorporates the dimension 'space' into analysis of the workings of the market. It does so by including space in logical schemes, laws and models which regulate and interpret the formation of prices, demand, productive capacity, levels of output and development, growth rates, and the distribution of income in conditions of unequal regional endowments of resources. Furthermore, regional economics moves from "space" to "territory" as the main focus of analysis when local growth models include space as an economic resource and as an independent production factor, a generator of static and dynamic advantages for the firms situated within it – or, in other words, an element of fundamental importance in determining the competitiveness of a local production system. (Capello, 2009)

In this context, regional economy relies on the respective structure and organization of public administration bodies, degree of saturation of local and regional markets, identification of needs, resources and their contribution to ensuring social and economic equilibrium.

Essential for shaping the regional economy at the national level is the balance between the innovation and cohesion growth poles in terms of intellectual resources and high technology platform on the one hand and development of areas outside the growth poles and rural life on the other. The proportionality of these relationships as well as the value relationships can be perceived in the following correlations:

- human resources, employment, education system, labour productivity,
- competition, scientific progress, innovation, knowledge transfer, new technologies, infrastructure,
- territorial planning, cohesion, integration,
- policies, competencies, financial resources, legal and legislative environment.

Active implementation of regional economy policies contributes to regional competitiveness. Thus, regions profoundly profit from public-private partnerships in terms of the flow of investment with higher added value, technology and knowledge transfers, employment and income growth.

1.2.2 Essentials of regional economics

For national economy to thrive, sustainable regional development is vital. Regional development is conditioned by the level of appreciation of available resources and the usage of regional and economic policy tools. In the course of time, regions experienced economic developments leading to their current stage of social and economic development. Thus, *regional policy* is applied as a fundamental tool of enhancing regional development. In terms of economic functions of the state and government, regional policy is intended to mitigate interregional disparities in social and economic development.

To put it simple, regional policy refers to strategies focused on regional development and mitigation of regional inequalities. Regional disparities cannot be removed or mitigated by the market mechanism. It is the role regional policy to mitigate striking differences in the level of economic and social development of the regions. This way, economic growth is supported.

Regional policy is a set of objectives, tools and activities to improve the spatial organization of economic activities, reduce regional disparities, and ensure economic, social and territorial development of regions. (Výrostová, 2010, p. 210-211) Ivanová (2008, p. 19) notes that regional policy is implemented by national and regional bodies with regard to sectoral, structural and urban policies.

Ivanička and Ivaničková (2007) claim that regional policy was developed in order to maintain territorial dynamics and prosperity, or reduce regional disparities, regulate migration and make regions, cities, towns and villages sustainable. Moreover, governments, local governments and other institutions use regional policy for drawing up regional development plans.

According to Skokan (2004), regional policy covers conceptual and efficient activities of state, regional and local institutions aimed at defining the main directions and strategic objectives of regional development and creating procedures, methods and resources for their implementation. Similarly, Rajčáková (2009, p. 17) argues that regional policy is primarily controlling activities of the state and territorial institutions which aim to create favourable conditions for dynamic and all-embracing regional development while fully utilizing their geographic, human and economic potential.

Regional policy refers to influencing economic processes through the public sector in territorial parts of states or large economic areas (Maier and Tödtling, 1998). Territorial parts are mostly large areas or regions that delimited in terms of homogeneity or functional dependence. Regional policy attempts to influence the development of large regional economic entities in a particular economy.

Habánik and Koišová (2012) note that regional policy is to eliminate significant differences in living conditions at regional and local level, limit the negative effects of structural changes, especially unemployment, and to promote the development of backward local areas. Belajová and Fáziková (2005) share a similar view saying that regional policy aims to reduce regional disparities, correct the spatial allocation of production factors and support the economic growth of regions.

There have been debates led in professional and academic circles as to whether the objective of regional policy is to reduce/ balance regional differences or focus on balancing regional development in order to increase the level of the national economy and catch up with advanced countries. On the one hand, there are advocates of *mitigating regional disparities* who believe that extreme regional disparities may lead to social and political turmoil, particularly in less developed regions with high unemployment, low income and standard of living. On the other hand, their opponents support the idea of regional policy aimed at the *growth and development of all regions*, placing emphasis on the activation of available resources. Therefore, they propose to provide support and investment to those regions where the best results are expected.

Nevertheless, they both are extreme approaches to regional policy. As a matter of fact, regional policy is implemented as a combination of efforts to make economies grow and develop while mitigating unjustified regional disparities and searching for ways to promote efficient use of regions' own resources.

Regional policy in the Slovak Republic

There were four phases in the evolution of regional policy in the Slovak Republic, each reflecting particular milestones in history.

The first phase covered the time span after the Second World War, when Slovakia was part of Czechoslovakia. That time, a centrally planned economy model was used and regional development was centrally planned and managed, and was carried out on the basis of unified state

plans for economic development. These five-year plans also included the principles of progressive alignment of the economic and social levels of less developed areas, and later of selected urban agglomerations and border areas.

The second phase started after the revolutions of 1989. The process of transforming centrally planned economy into market economy made pronounced regional disparities occur since inefficient state-owned enterprises were closed down, unemployment sharply increased, and some regions failed to adapt to new environment. After Czechoslovakia became a federal country, various institutions were set up to tackle the problems of regional development in federal states.

The next stage was related to the foundation of the independent Slovak Republic on 1 January 1993. Several documents related to regional development and regional policy were approved, such as the Concept of State Regional Policy (1997), Principles of Regional Policy of the Slovak Republic (2000), Act on the Promotion of Regional Development (2001).

The fourth phase was related to the accession of Slovakia to the European Union. After 2004, key documents on regional development and regional policy were adopted, such as National Strategic Reference Framework (2007), Regional Development Support Act (2008), National Strategy of Regional Development of the Slovak Republic (2010). Since Slovakia's accession to the European Union, regional policy has been closely linked to the EU's regional policy, and its tools, funds and budget.

Regional policy of the European Union

Levels of economic development, standards of living and unemployment rates are the key factors in the EU regional development. Regional development and regional policy rank among the most significant activities of the European Union. The enlargement of the European Union has greatly increased disparities among regions. Alleviating disparities among regions is challenge in all countries. (Habánik, Koišová, 2011)

EU regional policy is implemented at following levels (Wokoun, 2003):

- *supranational level* – or EU regional policy implemented directly by the European Union;
- *national level* – regional policy implemented by individual member states. It is highly differentiated, but some common rules are being gradually adopted;
- *regional level* – in most countries, regional policy is also implemented at regional level. This level is strengthened on a long-term basis under the principle of subsidiarity.

Výrostová (2010) notes that EU regional policy should strengthen economic, social and territorial cohesion by reducing disparities between the levels of development in EU regions and countries. Sobotková (2015) argues that member states are also responsible for regional policy, therefore additional funds for its implementation at national level should be earmarked. This issue is special in terms of connecting regional policy to investment. Under the Treaty of Lisbon, the European Union is committed to supporting the achievement of the objectives by using structural funds, European Investment Bank funds, etc.

Moreover, the Cohesion Fund and structural funds are used to implement cohesion policy of the European Union. Other financial instruments include the loans and guarantees from the European Investment Bank and so on.

Structural funds, such as the European Regional Development Fund and European Social Fund aim to alleviate regional disparities. Cohesion fund aims to strengthen economic and social cohesion in order to promote sustainable development. The main difference between the two is that Structural Funds are targeted at regions whereas the Cohesion Fund is targeted at states. Their purpose is to contribute to reducing regional disparities and enhancing regional development.

The issues of the EU cohesion policy and regional growth were also dealt with Crescenzi and Giua (2014) who maintain that the most relevant territorial factors conditioning the policy's impact are institutional and structural. With respect to the institutional elements,

the EU Regional Policy impact is positively influenced by the degree of decentralization in the countries in which it is implemented (Bahr, 2008) as well as by the presence of national-level 'supportive Institutions' in terms of inflation controls, trust, openness and the lack of corrupt practices (Ederveen, De Groot and Nahuis, 2006), the degree of openness of the economies (Ederveen, Gorter, Mooij and Nahuis, 2002) and national "institutional quality" in terms of the rule of law, corruption, bureaucracy, expropriation risk and governments' treatment of contracts (De Freitas, Pereira and Torres, 2003).

With respect to the role played by regional structural characteristics for the impact of the EU Regional Policy, one of the discriminants is the geographical position of the beneficiary regions with respect to either the geographical 'core' of the European Union or a country's decision-making centres (Soukiazis and Antunes, 2006). Another discriminating factor refers to the initial conditions of the regions considered. The Regional Policy's effect is positive with regard to less developed European regions ('Objective 1' regions and cohesion-country regions). This has also been confirmed in terms of GDP per capita level, GDP growth, employment (Bouayad-agma, Turpin and Védrine, 2010; Esposti and Bussoletti, 2008; Mohl and Hagen, 2008; Ramajo, Márquez, Hewings and Salinas, 2008) and cumulative job creation (Martin and Tyler, 2006). The same results were found by analyses that pooled the regions of all the 27 European countries together. Furthermore, country-level effects are also relevant. Once regions are clustered by country, the positive impact on convergence is not confirmed for Germany, Greece or Spain (Esposti and Bussoletti, 2008). The policy's impact is stronger in European areas with stronger absorptive capacity and weaker in the most disadvantaged areas (Cappelen, Castellacci, Fagerberg and Verspagen, 2003). Finally, innovative capacity and Social Filters (broader regional socio-economic environment) are discriminants for European Territorial Infrastructural Policies (TEN-T) financed by the EU Regional Policy funds. In their absence, the policy's impact is non-significant or even negative (Crescenzi and Rodríguez-Pose, 2012). There is also consensus on the idea that the effect of total expenditure is not positive in absolute terms but individual areas of policy intervention may produce heterogeneous effects (Dall'erba, Guillaín and Le Gallo, 2007). Only 'education and

human capital' investments have actually sustained medium term growth. Instead, support for 'agriculture and rural promotion', 'infrastructure' and 'business' was less effective (Rodríguez-Pose and Fratesi, 2004)

1.3 Regional development and regional disparities

The factors influencing a country's development are socio-economic, historical and political. The factors are specific in all countries; therefore, their development is uneven. As regional disparities are widening, a policy aimed at regional development and mitigation of regional disparities is becoming a priority in ensuring the competitiveness of regions.

1.3.1 Regional development

Regional development is viewed as the development of a region. It is a holistic process aimed at achieving progress in economic, social, cultural and environmental areas. In terms of social and economic conditions, regional development relies on the potential of regions in the areas of human resources and employment, research and innovation capability, business sphere and institutional arrangements, competencies and resource allocation, infrastructure, etc. The mission of regional policy is to stabilize social, economic, political and other processes taking place inside and outside the regions, yet affecting them, and search for methods, tools and resources to eliminate potential inequalities.

According to Benčo (2005), regional development is "a long-term systematic process of executing favourable changes in regional economy. It includes all its stakeholders, i.e. businesses, institutions, public authorities, households. The process relies on regions' individual capability of producing with comparative advantages and creative use of resources available to the regions".

Regional development is a process that aims to make regions productive and viable (Liptáková, 2007). One of its missions is to launch long-term processes of building regions' competitiveness while fully utilizing their local potential and spatial peculiarities. Special attention shall also be paid to the introduction of new technologies, workforce skill improvement, use of alternative energy sources, raw materials, etc. Regional development as the outcome of effective regional policy implementation should also provide financial support and methodological guidance to the territories in need of help.

Regional development issues play a key role in the political agenda of many countries and transnational institutions, such as the European Union (EU), OECD and World Bank. Spieza (2003) notes that the increased concern with regional development issues is related to the erosion of the state borders (EU integration processes, NAFTA), the growth in global competition, efforts to ensure social cohesion and enhance economic growth. Last but not least, the concern is linked with the awareness of high productivity of companies and workforce being centred around a relatively small number of regional poles.

Habánik, Hošťák and Kútík (2013) argue that unmanaged regional disparities reduce the capability of countries to promote economic growth and social cohesion, whereas regional development is considered a must for economic development and rising standards of living. The Treaty establishing the European Economic Community (1957) includes a provision on the efforts to ensure harmonious development by reducing regional disparities between regions and removing the backwardness of less-favoured regions (Hošťák, 2015). As mentioned previously, there is a growing emphasis on territorial cohesion of less developed regions in the context of the EU enlargement process. Under the Lisbon Treaty, regional cohesion is becoming a priority in the future cohesion policy. Similarly, there is an increased concern with regional development issues among world institutions, such as the UN, OECD and World Bank. With regard to the increasingly important role of regional development, it is necessary to develop, collect and systematically analyse the indicators of regional development. Simultaneously,

instruments for the assessment of various aspects of regional development dynamics need to be developed.

Factors of regional development

The analysis of relevant development factors, i.e. the identification of key factors having a significant and stimulating impact on regional development must be made in terms of effective regional policy. *Regional development factors* change over time. On the one hand, it is related to the level of knowledge of socio-economic processes. On the other hand, regional development factors are subject to changes due to evolving structures and their interactions.

The following are the main factors of regional development:

- human resources,
- research, development, innovations,
- basic infrastructure and services.

The significance values attached to the regional development factors are based on the nature of human resources. Human resources are an active factor for further development, and they differ from other factors of a passive nature (which do not themselves result in a targeted change). They transform other sources or they make them work. In addition to the factors mentioned, green economy growth should be promoted.

Additionally, the following have a significant impact on regional growth and performance:

- globalization (regions are more sensitive than countries),
- technological changes (increasing service sector and knowledge-based economy; technology-driven regions are becoming more competitive),
- decline in the working-age population.

Yet, technology itself and innovative capability for regional growth and development are not enough as regions must be able to create a population of "high quality". They must be able to attract and retain

talented people, be well connected to global markets, have an adequate business environment, infrastructure, well-functioning labour market, etc. People and businesses concentrate in places where they can the most desirable benefits. In addition to the main factors of regional development and its main players, it is also important to define the determinants of regions' competitiveness, measure and analyse regularly the main trends of economic performance with regard to regional disparities. The following shall be considered:

- overall growth trends,
- analysis of GDP growth components (incl. regional level),
- assessment of the impact of main determinants of regional development and growth.

Traditional approach to regional policy aimed to promote technical infrastructure and formal education. It has turned out, however, that innovations and other growth determinants are closely connected with the dimension of space and concentration pointing to the growth of some regions based on these growth determinants. As mentioned previously, regions can be classified by the degree of urbanization (predominantly rural regions, intermediate regions, predominantly urban regions), the dynamics of GDP growth (fast growing, slowly growing), attractiveness and availability, etc. Added to the main components of regional growth and development (on the basis of a comparison of common characteristics of fast growing and slowly growing regions) should also be the employment growth and productivity growth. Further major regional growth components:

- a well-functioning labour market (employment) – in particular supply and demand, increased levels of employment rate, economic activity and employment-to-population ratio,
- population growth is also a distinctive feature of high-performing and fast-growing regions. Distinctive features of slowly growing regions are:
- regional factors (productivity, employment rate, population growth and its quality, increased levels of employment-to-population ratio, economic activity of the population) playing a more significant role

than national factors as slowly growing regions often suffer from a declining economic activity and lower labour productivity.

Regional development is considered sustainable unless the regions' internal potential and sources are destroyed. This is possible through a professional transfer of competences from regions to the institutional units of self-government. Professional transfer of competencies also means the alignment of institutional units with their programs. These aspects are referred to as functional relationships in the system of the regional economy, which is an area of study included in public sector economics.

1.3.2 Regional disparities

Over time, social, economic, historical and political events in countries have established conditions for uneven regional development. Uneven regional development is conditioned by resources of the region, such as physical characteristics, human resources, technical, economic and social conditions. With regard to the accessibility, quality and extent of utilization of these resources, there may be minor or major disparities in the development and economic level of each region.

Disparities are generally referred to as inequalities, differences, or heterogeneities. Professional and academic sources view disparities as different levels of economic and social development. These different levels create inequalities between the entities under comparison which result from polarization process and rapid growth of regional performance. This is negatively manifested in the accumulation of wealth and means of production as well as in unemployment and the overall social situation in these regions (Hudec et al., 2009, s. 197).

Stimson et al. (2002) describe regional disparities such as differences, inequality of features, phenomena or processes whose identification and comparison have a rationale (cognitive, economic, sociological, and psychological). Regional disparities arise from the ability of some regions to adapt to economic and social transformations

resulting in differences in the level of socio-economic development. The identification of the parameters of diversity is necessary in order to tackle the problems of economic performance or quality of life of the population in the regions in terms of social security (Rajčáková, 2009).

Regional disparities can be perceived as differences delimited in the abstract metric space. Disparities lead to an imbalance in social and economic development of the territory (Meliciani, 2015). Regional disparities are also perceived as differences between economic performance and welfare of regions (McSorley et al., 2016). Dubois et al. (2007) regard regional disparities as the result of polarization process caused by rapid growth in the performance of some regions with a negative impact on the accumulation of wealth and production factors in these regions, as well as on unemployment and social security.

Regional disparities can be caused by physical characteristics, settlement structure, location attractiveness, demographic structure, transport infrastructure, regional accessibility or regional economic specialization, and last but not least by the territorial and administrative arrangement. Thus, uneven regional development makes a number of economic and social disparities arise, such as for instance regional gross domestic product per capita, unemployment rate, average monthly wage, etc. (Tvrdouň, Kmecová, 2007).

Wokoun et al. (2008) classified regional disparities into three basic groups as shown in Table 1.2.

Table 1.2 Classification of regional disparities

Social disparities – population	Economic disparities	Territorial potential
Educational attainment	Population productivity	Nature's <i>potential</i>
Health care, state of health	Sectoral structure	Environment
Culture, housing	Research, development	Transport infrastructure
Crime rates	Infrastructure	Technical infrastructure

Source: own elaboration based on Wokoun et al. (2008)

Similarly, Výrostová (2010) classifies disparities into the following groups:

Economic disparities – showing differences in quantity and quality of the regions' output. Differences are measured by GDP per capita. Other indicators for measuring disparities include economic trends, sectoral structure, and demographic trends.

Social disparities relate to the income and living conditions of residents. Measurements are carried out by using unemployment rate indicators that are closely linked to regional economic capability and regional per capita income.

Distinct geographical and natural environment conditions are manifested in *territorial disparities*. Striking disparities are in population density, region size, and distance to markets.

Much research has been devoted to the examination of regional disparities. The research aims to identify the areas in which regions are lagging behind and what changes have been made in their system and structural areas. Weaknesses related to lagging behind regions occur typically due to the lack of resources, capabilities and ineffective utilization of regional potential (Michálek, 2012, p. 30-31). On the other hand, when comparative advantages are employed efficiently and effectively, positive disparities occur. Positive disparities are regarded as the strengths of regions. Positive disparities lead to competitive advantages made up of unique and valuable resources which are utilized effectively and efficiently.

With regard to the increasing importance of regional development, it is necessary to develop, collect and systematically analyse regional development indicators and develop instruments that can be used for the assessment of regional development dynamics. (Hošťák, 2015) For measuring of regional disparities a lot of methods exist that present interesting properties. Most of them used OECD, World Bank, EU and other institutions. Frequently used is Beta-convergence, Sigma-

convergence, Gini index, the Coefficient of variation, Atkinson index, Theil index and many more. The choice of method depends on the purpose and scope of the examination. We can divide these methods into two groups:

- first methods (indices) for measuring of inequalities (concentration) between regions: Gini index, Theil index, Atkinson index and
- second - for measuring of convergence (Beta convergence, Sigma-convergence, Coefficient of variation). An evaluation of regional convergence level lies in the assessment of evolution of regional indicators that characterize disparities and subsequently determining whether these differences are reducing (convergence) or increasing (divergence). (Havierníková, 2014)

The above methods have some advantages and disadvantages. Their practical use depends on the complexity of their composition, availability and usability of statistical indicators. Since regional disparities are a complex issue, a multidimensional approach must be used to examine them. In order to monitor regional disparities, levels achieved in particular areas by regions as well as their dynamics are monitored (Grmanová, 2012, pp. 79-80). The identification of causes and effects of disparities as well as the search for ways to mitigate them is an inseparable part of the analysis.

Regional disparities are an obstacle to economic growth. Moreover, they cause lower production and ineffective use of disposable resources. Inequalities in standards of living may cause riots, social dissatisfaction, higher crime rates and social exclusion in regions with high unemployment rates, and may have political consequences (Španková, Grenčíková, 2013). Thus, it is advisable for regional policy entities to efficiently utilize regional resources in order to achieve positive economic growth. Socio-economic regional and national development can be achieved when the prerequisites for improving the quality of life of residents through effective use of the regions' resources, reasonable spatial planning and environmental protection are created.

2 REGIONAL ASPECTS OF THE LABOUR MARKET STRUCTURE IN THE V4 COUNTRIES

Labour market is a heterogeneous type of market representing a complex socio-economic system. It is the place where employers and employees meet, who differs in professions, qualifications and others.

2.1 Labour market and labour market structure

Labour market structure significantly influences the functioning of the labour market and especially its results. The basic elements of the structure of the labour market are demand and supply of labour. The development of these two elements fundamentally influences changes and trends in the labour market.

In the labour market, companies (employers) are on the demand side of the market. Households that represent a working population are on the supply side of the market. Government also play a role in the labour market on the demand side and affect its functioning with various instruments in line with the goals of economic policy.

The *demand* of labour on the part of companies mainly depends on the marginal income, which is the monetary expression of the labour marginal product (the increase of the total product for the employment of the additional unit of labour) and the border labour costs (wage per additional unit of labour). The aggregate demand of all companies of labour depends on the real wage, business cycle, the volume and the structure of the gross domestic product, willingness to develop the business environment, demand for goods and services, the living standard of the population, etc.

The *supply of labour* is represented by working population. Labour supply consists of people who are employed as well as those people defined as unemployed. The labour supply of an individual is affected by the amount of nominal and real wages and the value of free time as an

alternative to work. With the rise in real wages, labour supply is rising, reflecting the substitution effect of wage change. The size of total labour supply in the respective economy depends on the number of working population, the quality and quantity of the work done, ways in which the workforce spend their leisure time. (Masárová, 2014)

In addition, labour supply is influenced by investment activities of economic entities, population and its age structure, migration of population, working conditions, etc.

Labour market is also affected by other factors, such as demographic changes, social conditions, geography, level of regional development and the macroeconomic policy of the state using fiscal policy, monetary policy and pension policy. Thus, there are labour market segmentation and typology. Labour market segmentation refers to certain social processes that lead to the segregation of certain groups of labour or even individual sectors into the labour market, leading to different socially-determined opportunities for individuals as well as social groups. (Winkler, Wildmannová, 1999)

Rievajová (2016) argues that the trends in the labour market have many specific features that are a manifestation of the uniqueness of labour. The process of social and economic transformation of society is complex, time-consuming, and permanent with the necessity to address the pressing societal issues, such as for instance unemployment. The global crisis and globalization have greatly hit labour markets of the world and lead to changes in the nature and content of work.

In general, the main determinants of the labour market are as follows:

The rate of economic activity – expresses the share of the economically active population in the total number of persons who are at least 15 years' old

Job loss rate – expresses the share of the unemployed registered with the Labour Office on the total number of employed persons

Unemployment rate – percentage of the unemployed (U) on the total number of economically active population (L), expressed in %, $u = U/L * 100$

Specific unemployment rate – percentage of unemployed people in active population; the unemployed are specified by gender, nationality, age, education, profession, etc.

Natural rate of unemployment – in a given economy, it represents the lowest sustainable rate of unemployment that can be achieved without the risk of accelerating inflation

Employment – expresses human potential and its value, influences labour productivity, $PP = Q / L$ (amount of work / labour force) or Q / T (amount of work / time)

Employment rate – an indicator which can be used to compare regions and/or economies. It is expressed as a proportion of employed people in the working age population, in %.

All these determinants can be influenced by the various national labour market policy instruments.

Labour market policy can be characterized as a system of support and assistance to citizens in their integration into jobs in the labour market. It is a set of forms, actions, measures and tools to be employed in employment services when working with registered unemployed.

Labour market policy is an integral employment policy. Labour market policy can be *active* or *passive*.

Passive labour market policy is a set of programs aimed at keeping the income of the unemployed, maintaining a certain standard of living. As a basic tool, it uses different forms of social instruments, such as unemployment benefits, benefits in material need, etc. These social benefits represent transfer payments being a burden for the state budget. Therefore, great emphasis is placed on an active labour market policy that has a long-term impact and can affect the overall structure of the labour market.

Active labour market policy is a set of programs aimed at improving access for the unemployed to the labour market and jobs and its efficient functioning. Active labour market policy (ALMP) is generally considered to be part of the labour market policy with no claimable passive unemployment benefit drawing, but tools and measures for which some activity needs to be done by the unemployed, employers and other institutions active in the labour market. (Rievajová, Klimko, 2015)

Its main tools are motivational, they serve to employ those target groups that are long-term disadvantaged in the labour market, such as graduates of certain fields of study or long-term unemployed. Specific tools include, for example, job placements, graduate internships, professional guidance services, education and training for the labour market, support for job creation, re-trainings, etc.

Košta et al. (2011) maintain that active labour market policy measures, however, cannot solve the problems of the labour market on their own and are only complementary to bridge the gap between supply and demand. The countries of the European Union use individual measures of active labour market policy to mitigate the effects of current labour market problems as well as programs implemented under APTP are widely employed in the EU27. They can be classified as follows:

- general public employment services,
- education,
- rotation and job sharing,
- incentives for employment,
- promoting employment and integration of the disabled,
- direct job creation.
- support self-employment.

Active and passive labour market policies are to mitigate disproportions in the labour market, reduce social polarization in society resulting from income polarization, but above all to increase the level of

employment that significantly influences the macroeconomic performance of the national economy and represents the level of use of human capital in society.

An active labour market policy proposes specific instruments for a broad, yet clearly defined target groups and goals. The separate goal is to support the employment of the first employee or the long-term unemployed.

The key objectives of active labour market policy can also cover the creation of conditions to increase the quality of work supply (e.g. through trainings), increase labour demand (e.g. by creating new jobs in the economy) or improve the matching between job demand and vacancies (e.g. through different forms of job search support).

According to the APTP expenditure structure in 2011-2016, APTP spending in Slovakia was mainly directed to direct job creation (35.3% of total APTP expenditure) and support for self-employment (36.6% of the total APTP expenditure). Therefore, it can be inferred that active labour market policy is aimed at improving the overall functioning of the labour market to the unemployed. Labour market policy aims to strike a balance in the labour market. On the contrary, in the Czech Republic and Poland, support for employment and integration of disabled people was predominant, and in Hungary there were financial incentives for employment. In the EU27 (e.g. Germany, France, Finland and Austria), however, most spending on activation of the unemployed goes to education (almost 40% of total APTP expenditure).

Imbalances in the labour market mean negative effects for the economy and society, for example, the income polarization is generated by the labour market, which, with its multiplier effects, creates economic and social differentiation in society. These phenomena are quite new in the V4 markets, and are related to structural changes in the economy and the labour market.

Relationships between income polarization and structural labour market reforms as well as production markets need to be seen in terms of the transformation of the economy, such as liberalization, privatization and deregulation on the one hand, and the policies

(economic, sectoral and social) implemented in the various phases of V4 preparation for the EU accession T on the other. The complexity of these processes is fully reflected in the regional level of economic structures and hence in the labour market. V4 countries have their specificities in the labour markets, resulting from the sectoral structure of the economy, the structure and education system, the level of regional development in the individual countries, regional disparities, domestic and foreign investment as well as labour market policy. In particular, the regional aspect of the labour market is significant in these countries, and it is becoming a subject not only of labour market policy but, in particular, of regional policy. Habánik, Koišová (2011) argue that regional policy is a clear and indispensable part of the government's economic policy as well as the common EU policy to mitigate inter-regional disparities, promote social and economic development, sustainable economic growth and employment. National regional policies are based on the basic objectives and principles of the EU regional policy.

The European Commission states that the purpose of EU regional policy is to reduce disparities between the levels of development of regions and mitigate the backwardness of the most disadvantaged regions (Articles 158 and 160 of the EC Treaty). One of the basic principles of the EU is the principle of solidarity, in terms of which the weaker get the support of the economically stronger nations. The large amount of funds allocated to Member States whose economic performance and standard of living are below the EU average (also applicable to the V4 countries) should help to remove regional disparities by creating development incentives in the regions. Tackling regional labour market problems is to contribute to the overall optimization of the structure of the labour markets in the EU countries.

The employment rate is a standard and widespread indicator of the use of labour and labour market functionality. Employment rate is also one of the Europe 2020 target values (European Commission, 2010) and is also an appropriate indicator of the socio-economic level of countries. The European Union, in its 2010-2020 Europe 2020 strategy predicts that by 2020, at least three of the four active citizens of the EU aged between 20 and 64 will be employed on average. Therefore, the average

employment rate should be 75%. The post-2009 crisis period has brought stagnation or declines in employment in the EU countries. The employment rate was around 68.5% on average until 2014, i.e. still below the pre-crisis levels in 2008 and with no contribution to the target set for 2020.

These objectives as well as trends in the labour market developments in EU countries also apply to V4 countries. It should, however, be borne in mind that the V4 countries have their specificities in the labour market resulting from their overall economic, political, historical and social development. These specifications have been reflected in the applied labour market policy instruments at both regional and national level.

2.2 Labour market in the Slovak Republic

Current labour market developments in the Slovak Republic are characterized by the contradiction between the qualification requirements of the demand for labour and the qualification structure of the labour supply. One of the main causes of these disparities is the low level of adaptability of vocational training to the needs of the labour market and the knowledge economy. Alignment of training with labour market requirements is currently the top priority. Over the last two years, since mid-2016, unemployment in the Slovak Republic has been decreasing significantly, but new problems arise in the labour market due to the inconsistency between demand and supply. Labour offices in the SR in mid-2018 registered more than 77,000 unfilled jobs. Slovak companies suffer from long-term lack of qualified labour, which resulted in the employment of foreigners. In particular, there is a lack of skilled workers. There are 52,000 foreigners working in the Slovak labour market, mostly from the EU countries. The average number of job seekers registered by the Labour, Social Affairs and Family offices reached 227,542 in 2017. Compared to 2016 (300,988 persons), the number dropped by 73,446 persons (24.40%). The total number of job seekers was 195,585 in December 2017. Monthly, compared with

November 2017 (196,055 persons), it decreased by 472 (0.24%). Year-on-year, it decreased by 80,548 persons, which is 29.17% less (in December 2016 276,131 persons). The average number of disposable job seekers reached 192,506 in 2017. (UPSVAR, 2018)

From the regional point of view, the region of Prešov (11.47%) reached the highest average level of registered unemployment in 2017. The lowest rate was recorded in the Bratislava region (3.63%). Above the level of the Slovak national average (7.06%) were: Košice region with an annual average of 11.31% and the region of Banská Bystrica with 10.42%. (UPSVAR, 2018)

As of 1 May 2018, the amendment of Act No. 5/2014 Coll. on Employment Services (hereinafter referred to as the "Employment Services Act") entered into force in the SR, which has introduced several changes to the labour market. In addition to the newly introduced employers' obligation to publish the salary offered in job advertisements, the changes have also significantly covered the employment of foreign workers (certain procedures have been changed in the field of employment of third-country nationals in the Slovak Republic).

Following this law, the government approved a draft amendment to the Act on Employment Services, which should be implemented from the beginning of next year with the measures resulting from the strategy of the working mobility of aliens in Slovakia. These measures are intended to streamline, facilitate and accelerate the system governing the entry and residence of third-country nationals in Slovakia for the purpose of employment, especially in the professions facing labour shortages.

"This is a measure to help prevent the misuse of third countries citizens in the Slovak labour market, especially social dumping with regard to wages," said the Ministry of Labour.

The main reason for the amendment of the Act on Employment Services is the growing shortage of qualified labour force, the decreasing number of job seekers registered with labour offices, social affairs and families, as well as the decreasing national labour supply. In particular, the amendment aims to simplify the conditions of employing foreigners in the Slovak Republic.

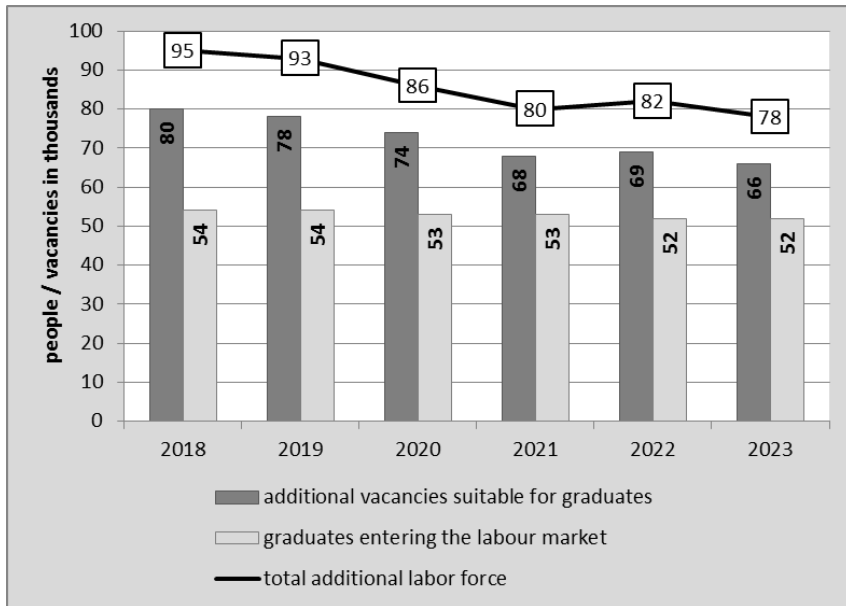
Despite a significant lack of labour force in Slovakia, there are still many areas with an excessive number of suitable labours. The macroeconomic view often masks internal structural problems and problem solutions. To solve any problem, it is necessary to find its origin and address it. (Trexima, 2018)

Ministry of Labour, Social Affairs and Family of the Slovak Republic, as part of the Labour Market Development Forecasts in Slovakia II, launches the so-called "road show" across all Slovak regions in November 2018. The project aims to match the needs of the labour market and the education system at secondary and higher education institutions. Since 2014, this has been supported by the national project of the Ministry of Labour, Social Affairs and Family entitled Labour Market Development Forecasts in the Slovak Republic.

In the first stage of the project, an effective system for collecting, analysing and evaluating information on labour market needs and employability of graduates was developed. Under the project, labour market needs were defined for the first time and the employability of graduates was evaluated. The follow-up project is a five-year project (by 2023) which quantifies the labour market needs and monitors the employability of graduates at a higher level. Decision-making processes have been complemented with additional extensions, innovations and improvements to forecasting systems, as well as the need to regularly update results in relation to developmental trends.

Labour market trends in terms of labour market needs were developed by Trexima. Trexima analysed the overall situation in detail and predicted trends in the coming five years (graph 2.1).

Graph 2.1: Development of labour demand and supply in the Slovak Republic by 2023



Source: authors' own elaboration by Trexima (2018)

According to this forecast, Slovakia will need 514,000 new workers by 2023. 60% of them will replace those leaving the labour market to retirement. Vacancies will arise mainly in industry, commerce, education, health, transport and construction. From the regional point of view, 90,000 jobs will be created in the Bratislava region, followed by the region of Nitra with 70,000 new jobs. The lowest number of vacancies will be created in the region of Banská Bystrica and Prešov region by 2023 (50,000 to 55,000).

Thus, from 2018-2023 there will be approximately 514,000 additional jobs in the SR, of which approximately 436,000 will be suitable for graduates. At the same time, nearly 320,000 graduates will enter the market. This means that graduates will at best cover 62% of the total number of new vacancies or 73% of the demand for positions suitable for graduates. Even if employing all graduates entering the labour market,

another 200,000 vacancies will remain unfilled by 2023. For these vacancies, employers will need to find suitable people elsewhere, especially among unemployed persons and foreign workers. The number of new vacancies is likely to rise due to labour shortages.

2.3 Labour market in the Czech Republic

The Czech and Slovak labour markets share some features and trends. The development of the Czech labour market, for which labour demand and labour supply are typical, heavily relies on the economic development, economic cycle, business environment and adjustment of all government policies affecting the labour market (employment, social, economic, and budgetary policies). The Czech economy, however, mainly relies on the processing industry to be exported which is highly sensitive to business cycles. Currently, there is an economic expansion which significantly affects the labour market.

Currently, relatively positive trends in the labour market have resulted in dynamic changes in the labour demand and labour supply. In November 2018, unemployment in the Czech Republic dropped to 2.8%, the lowest for the past 22 years. There were 215, 622 unemployed and 316, 884 vacancies. At the same time in 2017, the unemployment rate was 3.6 % with 271,005 unemployed persons and 210,000 vacancies. Based on the Labour Force Survey (LFS) in mid-2018, 5.29 million people were employed, which was a record employment rate of 74.7% for the 15-64 age group. The regional unemployment rate was the highest in the Moravian-Silesian Region (3.7%) and Ústí nad Labem (3.6%), while the lowest unemployment rate was in Prague (1.1%) and South Bohemia (1.2%). (ČSÚ, 2018)

There are also a large number of people in the Czech Republic who do not work, do not actively seek work, yet stated in LFS they want to work. This unused category of workforce decreased year-on-year to 108.4 thousand people. It is almost comparable in size to the group of unemployed and has posed a challenge for employers and employment policy. Outside the territory of the Slovak Republic, there are huge labour

reserves in the European Union free movement zone. They are mainly the southern member states that have been facing dramatically high youth unemployment.

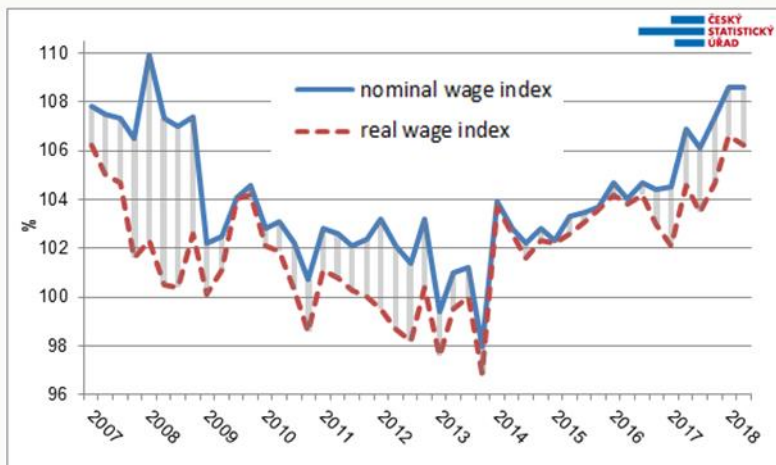
There are some sectors in the national economy that do not follow the overall trend of employment growth. One of them is the coal industry, in which the employment fell by 3% in 2018 compared to 2017. Next is the sector of administrative and support activities with predominant job agencies. In this sector, the number of employees dropped by 0.5%. On the other hand, the number of employees increased by 1.2 thousand in constructions (+ 0.6%) and by 2.9 thousand (+ 2.5%) in the formerly problematic sector of accommodation, catering and hospitality. An increase of only + 0.1% was recorded in the arts, entertainment and recreation industry.

The biggest increase was recorded in the manufacturing with largest employers. The increase was of 15.8 thousand (+ 1.4%). The manufacturing was followed by wholesale and retail, which grew by 15.6 thousand (+ 3.2%).

A relatively high increase was in the production of electricity, gas, steam and cold air (+ 6.5%) production and distribution sectors, real estate sector (+ 6.4%) and ICT (+ 5.1%). ICT sector has recorded a long-term growth.

This imbalance in the labour market creates synergy effects in other relevant labour market areas. The situation on the labour market leads to significant changes in wage development. The wages have been growing notably in 2018. In terms of wages, this year is marked by strong growth. More details are shown in Graph 2.2. The average wage (CZK 31,851) increased in the second quarter of 2018 by 8.6% compared to the second quarter of 2017. In real terms, however, wages were not growing that much. Wages rose by 6.2%. In the first quarter of 2018, wages rose by 0.4 p.p., with inflation comparable to 2017 (- 2.3%) (consumer price index as the difference between the two lines is shown by hatching in the Graph).

Graph 2.2: Wage development in the Czech Republic



Source: ČSÚ, 2018

There were also significant increases in earnings in the state-run sectors. The highest average wage increase was in art, entertainment and recreation - by 13.1% to CZK 28,142, which is 88% of the total average for the national economy. The second fastest wage growth is found in education (12.3%) to CZK 30,177, health and social care (12.0%) to CZK 33,439 and slightly less in public administration and defence (11.2%) to CZK 36,339. Maybe a bit surprisingly, a rise in average wage by more than ten percent (10.1%) was recorded in mining and quarrying (to CZK 36,599). In contrast, in the two best-paid sectors, the year-on-year wage growth was the weakest, in banking and insurance, wages grew by 6.3% to CZK 58,594, which means the highest wage level among industries, followed by ICT with an average wage increased by 6.1% to CZK 54,318. In commerce, the average wage increased by 7.6% to CZK 29,485. In industrial sectors, wage growth was of 8.0%. The increase of 7.4% was found in agriculture, forestry and fisheries. (ČSÚ, 2018)

In terms of regions, the increase in average wage was most pronounced in the region of Central Bohemia (10.7%) with the second highest wage level (CZK 33,873). In the capital, the average wage was least increased (6.9%), yet still remaining the highest (CZK 39,688). The lowest wages were in the region of Karlovy Vary with the 8.3% average wage increase. The second strongest wage growth was in the region of Hradec Králové (10.2%). As a matter of fact, the fastest increase in the number of employees continued to be in Prague. In the second quarter of 2018, there was a 4.4% year-on-year increase in the number of employees. There was no decrease in the number of employees in any region: the least decrease was found to be in the region of Karlovy Vary (0.2%); the second largest increase in the number of employees was in the Liberecký region (2.4%). (ČSÚ, 2018)

The labour market situation will lead to further wage growth. Companies are experiencing problems with rising labour costs. Rising wage costs and energy prices and rising corporate loans (rising interest rate) can have harmful effects on Czech companies. Many companies are experiencing decline in profits what will have a negative impact on the development of the Czech business environment. (Holý, 2018)

Foreign labour could solve the problems of the Czech labour market, but not in a comprehensive manner. Although several European countries are facing high unemployment (especially Greece, Spain and Portugal), the Czech Republic is not attractive enough for employees from these countries. Willingness to move is still low for skilled and experienced workers from Western Europe also due to cultural and language barriers.

On the other hand, the Czech Republic is attractive and culturally close to the Eastern European countries. Thus, the labour shortage might be fixed with employees coming from these countries. Unfortunately, Czech legislation hampers the employment of foreign labour, particularly of the third-country nationals. Employers lack sufficient resources to meet bureaucratic requirements and become dissuaded from seeking to employ foreign labour.

A completely different situation regards the young West European generation without any work experience. Prague has been the most attractive destination for them as they can find a job there much faster than in their home countries. The statistical data say that while the CR records 6.8% unemployment among those below 25 years of age, the European average is 17.3%. Recently, cities of Brno, Pilsen, and Olomouc have joined the capital city of Prague. These cities organize purposeful activities to attract aliens who would work at local salaries.

Moreover, many positions require technical knowledge and experience while others are the positions for which candidates are being profiled. Technology changes lifestyle, working environment and priorities. We are all well familiar with the concepts of flexible work arrangements, telework, or working nomads as they are associated with the team work of today. Flexible working hours are a particular challenge in manufacturing, where workers are more and more reluctant to work under the given working conditions.

Promoting mobility, wage increases, comprehensive system of recruitment and development are the only options to those wishing to succeed in recruiting and retaining local workforce.

Steadily declining unemployment, rising pressure on wages and high turnover emphasize the need of investing more in new technologies, external marketing communication in order to build an employer's brand in both large cities and regions. A recent challenge has been posed by three generations working in one workplace. This creates enormous pressure on leadership, investing in training programs, new forms of motivation, and employee retention.

Many of these objectives are formulated in *The Employment Strategy by 2020* by the Czech Ministry of Labour and Social Affairs. The Employment Strategy identifies the problems of the Czech labour market, its root causes, main target groups to be supported with measures and instruments of active and state employment policy in order to reduce unemployment and address the imbalances in the labour market. The Strategy proposes measures to increase employment and employability of jobseekers, promote adaptability of both employers and

employees. The Employment Strategy also respects regional aspects of employment policy and shifts the focus of employment policy measures on economically backward areas. Moreover, the Strategy addresses the problems of people with disabilities and people at risk of poverty or social exclusion.

The Employment Strategy identified four main priorities:

- promoting access to employment, especially for groups at risk in the labour market,
- promoting gender equality in the labour market,
- supporting the adaptation of enterprises and employees to the changing needs of the labour market,
- development of public employment services.

The strategy was developed for 2013-2020, the situation in the labour market has changed dramatically since 2013 as a result of the overall development of the economy. The projected figures for 2018 were exceeded and their values are approximating the 2020 projected values, such as employment rate (73.8), unemployment rate (7%), employment rate of women (64.4%), employment rate of people aged 55-64 (53%).

2.4 Labour market in Hungary

Hungary's labour market reflects the economic situation of Hungary. Hungary's steady economic recovery offers a window of opportunity to ensure sustainable growth in the coming decade. The country's financial vulnerabilities seen in the aftermath of the crisis have been markedly reduced and the economy has been staging a steady recovery. Real GDP surpassed its pre-crisis peak in 2014, whereas domestic demand and investment reached similar levels by 2017. After a temporary lull, the Hungarian economy grew strongly in 2017. GDP is estimated to have

grown above potential helped by a supportive external environment and accommodative domestic policies. Household consumption was boosted by double-digit wage growth. Investment picked up strongly also due to the resumption of EU fund absorption. In 2018, growth is projected to remain strong as supporting factors are expected to prevail.

Economic growth continued to be primarily driven by domestic demand. Strong growth is set to continue. Real GDP growth is projected to increase by 3.7 % in 2018, but to slow to 3.1 % in 2019 as capacity constraints emerge on the back of a gradually widening positive output gap. In 2019, economic growth is projected to slow as a result of a build-up in capacity constraints, slowing growth of real disposable income and moderating trade as economic recovery matures in the EU. (Country Report Hungary, 2018)

In addition to economic factors, on the labour market in Hungary have an impact the demographic trends.

The population of Hungary was 9 798 000 on 1 January 2017, and is the result of a continuous decline, with an additional fall of 0.33% against the previous year. The size of the entire active age population decreased by 15 thousand between 2001 and 2010, which is primarily because the decreasing headcount of the cohorts in that period was offset by the increase of the retirement age of women. The size of the entire active age population will decrease by 217 thousand between 2010 and 2020 and by 360 thousand between 2020 and 2030.

Based on the Labour Market Survey data for the fourth quarter of 2017, the economically active population aged 15-74 numbered 4 622 600, with the participation rate standing at 62.1%. Of the active population, 4 447 400 were in employment, while 175 200 were unemployed. Employment in Hungary entered a growth period in 2017; various government measures contributed significantly to the growth in the number of people employed. The employment rate was 59.8% of the population aged 15-74, a rise of 1.0 percentage point (ppt) against the same quarter in 2016. The number of persons in the 15-74 age group considered as being unemployed under the ILO definition has been

declining since the January-March period of 2015, and it also followed the seasonal trend in this quarter.

In the fourth quarter of 2017 the number of people unemployed as defined by the ILO had already reached the 200 000 mark, standing at 175 200, which is well below the pre-crisis figure (second quarter of 2008: 315 500). In the second half of 2017, the average month-end number of jobseekers on the National Employment Service (NFSZ) register was 257 700, a significant drop compared to previous quarters. One of the causes of this change is the different pattern of development of workfare schemes during the year as well as their increasing dominance on the Hungarian labour market.

In the fourth quarter of 2017, 10.2% of jobseekers were looking for their first job; their numbers following the trend of the total number of jobseekers, with a decline compared to the second half of 2016.

Of all jobseekers 44.0% had completed the maximum eight years of primary education, 23.2% had graduated from a vocational school or a skilled workers training school, another 27.1% had obtained a secondary school leaving certificate, and 5.7% held a degree from a higher education institution. The proportion of first-time jobseekers with only the maximum eight years of primary education was 46.0%, while another 38.5% had obtained a secondary school leaving certificate and a further 4.2% had obtained a degree from a higher education institution.

From a regional perspective, Borsod-Abaúj-Zemplén and Szabolcs-Szatmár-Bereg counties had the highest number of jobseekers (35 000 and 29 200 respectively), and the composition of jobseekers by level of education is typically less favourable than the national average in those regions where the labour market situation is worse. On a year-on-year basis, the average number of jobseekers declined over the past 12 months in nearly every county. The highest rate of decline has occurred in Budapest (18.1 ppt) and Tolna County (14.9 ppt). (Eures, 2018)

According to the most recent available labour market data of the EU, the employment rate of the 15–64 year-olds was 68.7% in the 4th quarter of 2017 in Hungary, 0.7 percentage point higher than the EU average, within which the advantage grew to 2.8 percentage points in case of men,

while, similarly to the previous quarter, the disadvantage was 1.1 percentage points for women. With the 84.0% employment rate calculated for the 25–54 year-olds, i.e. people in the best working age, we were in the top third of EU member states with the highest employment rates. It is encouraging that the Hungarian value is only 1.2 percentage points away from the 75% employment rate of the population aged 20–64 targeted in the Europe 2020 strategy. The relatively high employment was accompanied by low unemployment, and, only 3 member states (the Czech Republic, Germany and Malta) had unemployment rates lower than the 3.8% in Hungary also in the 4th quarter of 2017. (Eurostat, 2018)

According to the statistics of the Ministry of Interior⁴ on public employment, the monthly average number of people registered as public workers was 151 thousand in the 1st quarter of 2018, which meant a decrease of more than 40 thousand (32%) compared to the same period of the previous year. The drop in the headcount was also accompanied by the deterioration in the composition by educational attainment, as the employment opportunities of those with a qualification are considerably more favourable than those of unskilled workers.

Despite the overall improvement in the labour market situation, regional differences still exist. While in five counties the unemployment rate fell below 2% (Vas, Győr-Moson-Sopron, Tolna, Komárom-Esztergom, Pest counties), the rate was still 9.2% in Szabolcs-Szatmár-Bereg county. The difference between the unemployment rates of the counties in the best and in the worst situation was nearly 8 percentage points. In the 1st quarter of 2018, the average number of jobseekers registered at the National Employment Service was 277 thousand, 11% less than a year earlier. Public employment has become much more even, so the number of registered jobseekers has increased much less from February to March in 2018 than in 2017. One in every 10 jobseekers was career starter who account for the majority of those who register for the first time. Among registered jobseekers, the proportion of recipients of cash benefits is increasing, reaching 54% in the 1st quarter of 2018. The average number of recipients of insurance-based allowance with at most 3 months' entitlement, jobseeker aid before pension and jobseeker

assistance was stable at 60–70 thousand in recent years. The number of social benefit recipients is steadily decreasing, although at a somewhat slower pace than the number of registered jobseekers. (HCSO, 2018)

Hungarian companies have tried to recruit employees in Serbia, Ukraine and Romania more or less successfully. In some jobs affected by the skilled worker shortage – such as IT, drivers, construction professionals – Ukrainian and Serbian citizens can work in Hungary even without a job permit. It is problematic that many of them lack the necessary professional qualifications and they are employed illegally in seasonal jobs (agriculture, hospitality). The West's appeal remains strong: many of the third country citizens with a job permit move on to richer European countries. (Visegrad.info, 2018)

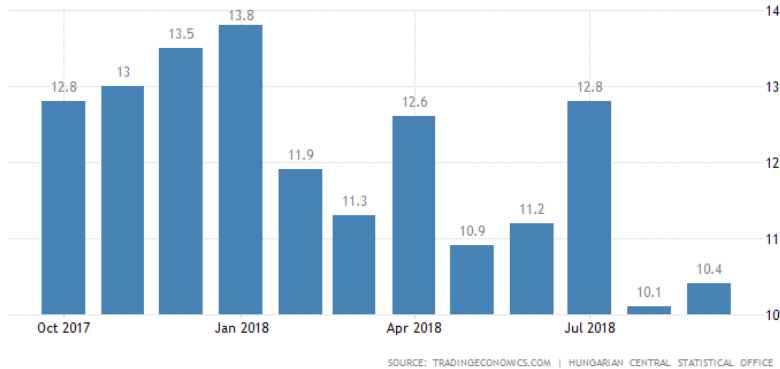
Changes in the labour market, labour shortages, caused wage growth in the national economy of the Hungary.

Average gross wages in Hungary rose by 10.4 percent year-on-year to HUF 322,800 in September 2018 after a 10.1 percent increase in the prior month. Wages in the public sector went up faster (8.5 percent vs 6.1 percent in August), while in the private sector advanced at a softer pace (11.1 percent vs 11.4 percent). Considering the first nine months of the year, average gross earnings went up 11.7 percent to HUF 324,100. Earnings growth was impacted by a boost in labour demand, rises of 8% in the minimum wage and 12% in the guaranteed minimum wage as well as salary adjustments affecting specific areas of the public sector and the employees of some state owned public service companies. Wage Growth in Hungary averaged 8.23 percent from 1999 until 2018, reaching an all-time high of 26.19 percent in January of 2005 and a record low of -5.30 percent in January of 2009. (Trading Economics, 2018)

In the 1st quarter of 2018, partly due to government interventions, earnings grew again significantly, and the main sources of growth were also the same as in the previous year. The minimum wage rose by 8.2% and the guaranteed minimum wage by 12%, under the agreements that had been concluded in previous years. Income from work used in international comparison of earnings, which, in addition to earnings (according to the Hungarian methodology), includes the elements of the

so-called other income from work, such as cafeteria benefits, amounted to HUF 331.8 thousand. Other income from work accounted for 4.7% of total income from work and amounted to HUF 15.6 thousand on monthly average (nearly HUF 190 thousand a year). The increase in other income from work in the business sector was 2 percentage points lower, but in the public sector it was three times higher than the growth of gross earnings. (HCSO, 2018)

Graph 2.2: Development of Hungarian wages for the period October 2017 - September 2018, in percentage



Source: Trading Economics, 2018

As we already reported, Hungary struggles hard with labour shortage which affects almost every sector of the economy. According to the latest data, there are 80 thousand unfilled workplaces in Hungary. The situation is getting worse in construction and industry, but there are considerable problems in transport, as well – reported the Hungarian Central Statistical Office (HCSO). Furthermore, the situation worsened in the info-communication and the service sector. Meanwhile, the Hungarian economy grows constantly. However, labour shortage makes it difficult to utilise this opportunity. Labour shortage affects almost every sector. According to portfolio.hu, the number and rate of unfilled workplaces is record high in Hungary. Based on HCSO’s latest data,

79,400 people are needed immediately. This number is 19,500 higher than a year before. In fact, the rate of unemployment is falling while more and more public workers find a job on the market.

This number is 19,500 higher than a year before. In fact, the rate of unemployment is falling while more and more public workers find a job on the market. However, this is not enough to compensate the ever growing demand. Based on HCSO's data, portfolio calculated that there are at least 59-61 thousand unfilled positions in the private sector. Process manufacturing needs the newest associates (24 thousand) while the highest rate of unfilled jobs is in service-helping (4.7%). In fact, labour shortage causes considerable problems in the info-communication and healthcare sector, too (3.6%). (Daily news Hungary, 2018)

2.5 Labour market in Poland

The labour market in Poland is an example of the market developed in the course of a historical process, the importance of which is essential for the proper functioning of economy in national, regional, and local dimensions. It should also be observed that since the market functions as the regulator of economic processes, its sustainability remains crucial from the perspective of broader development processes taking place in economy including the aspect of providing population with appropriate living standards or preventing excessive migration processes. (Przybyła, Kachniarz, Hełda, 2018)

The labour market in Poland has had an impact on administrative reform, especially in terms of development based on European Union funds.

Przybyła and Kachniarz (2017) states that by the year until 1998, Poland was divided into 49 voivodships constituting field government administration. The perspective of accessing the European Union structures and assigning regions with the task of regional policy implementation required introducing corrections in this division and establishing larger, economically stronger voivodships. Following the

administrative reform, which came into force on 1 January 1999, sixteen new voivodships were established in Poland, corresponding in size to the similar regional divisions of the European Union Member States. Simultaneously, in place of the existing forty-nine voivodship capitals, only eighteen cities retained the capital functions as the voivodship cities. Fourteen of them, i.e., Białystok, Gdańsk, Katowice, Kielce, Kraków, Lublin, Łódź, Olsztyn, Opole, Poznań, Rzeszów, Szczecin, Warsaw, and Wrocław, also remain the seats of the voivodship governor and the headquarters of the voivodship local government.

Administrative reforms, economic growth, and also unfavourable demographic impacts, affect the development in Poland, are a prerequisite for changes in the labour market at national and regional level. Growth is projected to remain strong in 2018 and 2019. An increasing utilisation of EU funds is expected to provide a strong stimulus to public and, to a lesser extent, private investment. Private consumption growth is projected to moderate from exceptionally high readings in 2017, while still remaining robust. It will be supported by strong wage increases. Strong domestic demand is forecast to translate into higher imports, but favourable developments in foreign markets should support a continued expansion of exports. As a result, real GDP growth is projected to reach 4.2 % in 2018 and 3.6 % in 2019.

As he says The Leading Public Affairs Agency in Central Europe Apart from a historically low unemployment rate in 2017, a record number of jobs have been created on the Polish labour market. As of the end of November, 250 thousand new jobs were created by Polish enterprises, the Rzeczpospolita daily informs. Notably, this is higher than in 2007 when the economy grew by 6.7%. Over a third of the new positions were created in the industrial sector, especially export-oriented companies such as car manufacturers, metalworking or furniture factories. This is applauded by economists who argue that such jobs translate into productivity which is crucial to maintain Poland's growth these figures are also bound to satisfy the ruling party which puts a special emphasis on reindustrialising the economy. Still, businesses note that with such low unemployment and high rate of job creation it is increasingly difficult to find qualified workers. While it is true that around 250 thousand non-

EU foreigners held work permits in Poland at the end of 2017, this number will have to keep increasing. Even then, workers from countries such as Ukraine, Belarus, or Moldova – which are the top 3 countries of origin for foreigners – provide mostly unqualified labour. The Ministry of Development seeks to attract more economic migrants to Poland to fill gaps on the labour market but one of the biggest challenges of 2017 will be to maintain qualified candidates the level of available. (CEC Briefs Poland, 2018)

Employment grew stronger in 2017 while unemployment hit record lows. Employment growth was particularly strong in manufacturing and certain service sectors. This benefitted all population groups, with employment rates increasing for both men and women in almost all age groups (except women aged 30-34), people with different educational backgrounds and persons with disabilities. In the first half of 2017, the employment rate of those aged 20-64 exceeded 70 % for the first time since data has been available. In parallel, the unemployment rate continued to decline, hitting record lows in subsequent quarters. Falls in unemployment were observed for both female and male populations, and in both rural and urban areas. Youth unemployment (i.e. people aged 15-24) also declined steadily: at 14.7 % it was well below the EU average of 16.6 % in Q3 2017. Finally, the share of long-term job seekers among all unemployed people also decreased. (Atradius, 2018)

The harmonised unemployment rate published by Eurostat for March 2018 in Poland stood at 3.9 % (for the age group 15-74) compared with 7.1 % in the EU (28). The rate of unemployment registered (at labour offices) at the end of March 2018 was 6.6 %, i.e. lower by 1.4 % as compared to the previous year. It should be emphasised that the unemployment rate in March 2018 was the lowest of all rates recorded for the month of March in the past 27 years. Therefore, bearing in mind the positive developments, the forecasts are also optimistic. (Eurostat, 2018)

The drop in the unemployment rate is the result of a systematic decline in the number of unemployed persons registered at labour offices. In 2016, it decreased by 14.6 % and in 2017 by 19 %. The number of unemployed persons registered at labour offices at the end of 2017

was 1 081 700 and was lower by 253 400 than in the corresponding period of 2016. At the end of 2017, the share of women in the total number of unemployed persons registered at labour offices was 55.1 %, while that of men was 44.9 %. The main reasons for the decline in unemployment are: the increasing number of job adverts available at labour offices and a significant number of unemployed persons returning to work. At the end of March 2018, there were 1 092 200 unemployed persons registered at labour offices, representing a decrease of 232 000 (17.5 %) compared to March 2017. (Eures, 2018)

The economic activity rate of the population aged 15 and above was 56.4 % in 2017 (annual average) and increased by 0.2 % compared to 2016. The employment rate of the population aged 15 and over was 53.7 % in 2017 (annual average) and increased by 0.9 % compared to 2016. The unemployment rate in Poland for people aged 15 and above was 4.9 % in 2017 compared 6.2 % a year earlier.

The number of employees at BPO (business processes outsourcing), SSC (shared services centres), IT (information technology) and R&D (research and development) centres in Poland in Q1 2018 was 30% higher than in Q1 2016, which means that 65,000 new jobs had been added. The Compound Annual Growth Rate in the period under analysis was 14%. Employment increased by 15% in the period from Q1 2016 to Q1 2017. In the period from Q1 2017 to Q1 2018, job growth in the sector was two percentage points lower (13%), which means 33,000 new jobs (1,000 more than in the corresponding previous period). The vast majority (87%) were generated by foreign centres. The number of people employed in the business services sector in Poland is expected to exceed 300,000 as early as Q1 2019, i.e. a year sooner than previously forecast. According to the most likely scenario, total employment at BPO, SSC, IT and R&D centres in Poland in Q1 2019 will be higher than the Q1 2018 figure by 10.5% and amount to 308,000 people. Assuming a further 10.5% growth in the next reference period (Q1 2019 – Q1 2020), the number of employees in the sector will reach 340,000 people in 2020. (ABSL, 2018)

Based on the regional aspect, the business services sector created jobs in 40 locations. In 17 of them, business services centres employ over 1,000 people each. Eleven of the largest business services locations in Poland (Kraków, Warsaw, Wrocław, Tri-City, Katowice Agglomeration, Łódź, Poznań, Bydgoszcz, Lublin, Rzeszów and Szczecin) account for 95% of the industry's total headcount. In seven locations, the headcount at BPO, SSC, IT and R&D business services centres exceeds 10,000. Business services centres in the next ten locations have between 1,000 and 10,000 employees. Kraków once again remains the clear leader in the number of jobs in the sector. Kraków's business services centres now have as many as 64,000 employees, which mean that the city has a 23% share in the structure of employment in the industry in Poland. The sector created more than 51,000 jobs in Warsaw and 45,000 jobs in Wrocław. Compared to last year's summary, in three additional locations (Tri-City, Katowice Agglomeration and Łódź), the headcount in the sector exceeded 20,000. (ABSL, 2018)

As shown in the Regional Labour Market Barometer, the biggest demand for employees is declared by the employers from the Western Poland. In Dolnośląskie and Opolskie provinces, two thirds of companies plan recruitment. In the South-western region, 47% of employees are going to conduct recruitment. It is interesting that also in the Eastern region the recruitment plans have intensified and are declared by 44% of companies. The fewest recruitments are planned in the North and South of the country, yet also there 1/3 of the companies will look for new employees. The most difficulties with finding new employees were reported by companies from Dolnośląskie and Opolskie provinces (60.9%). (Work Service, 2018)

They are the early state of the Polish economy and the labour market situation requires employing foreigners.

Poland is experiencing strong economic growth. Domestic demand has been the dominant growth driver for the last 3-4 years. In 2016 and 2017, private consumption contributed the most to growth, given the weak performance of investment during that period. Private consumption was supported by favourable labour market conditions, increased fiscal transfers and record-high consumer confidence.

Estimated at 4.6 % in 2017, real GDP growth was among the highest in the EU.

The strong growth has resulted in a buoyant labour market performance. Employment continued to grow in the first three quarters of 2017. The employment rate of those aged 20-64 went above 71 % in Q2-Q3 2017. Wage growth increased visibly. This translated into a further, though limited, increase in activity rates. The unemployment rate has continued to hit new record lows (4.7 % in Q3 2017). These numbers may underestimate the actual growth in employment as they cover migrant workers only to a limited degree. Available data suggest that inward migration of labour, predominantly from Ukraine, continued to rise in 2017.

As Duszczyk and Matuszczyk (2018) stated, from the moment of Polish accession to the EU we can speak about greater interest in the Polish labour market, in particular among the citizens of post-Soviet republics. The principles on which labour immigration to Poland can take place can be divided into two fundamental types. The first is the free flow of citizens from other EU member-states; the second, the immigration of citizens of other countries who are obliged to obtain a permit to access the Polish labour market (OECD 2016). In the latter case several paths are possible. Definitely the most popular is either obtaining a work permit or pursuing employment based on an employer declaration that s/he has the intention to mandate the work to a foreigner. This instrument is flexible in nature. On the one hand, its introduction could bring about a swift effect in the form of an inflow of employees from third states that thus enjoy facilitated access to the Polish labour market. On the other hand, its elimination or restriction (e.g. through the introduction of additional bureaucratic obligations for employees or employers) is likely to result in a very rapid reduction in the scale of immigration – which would, however, entail a high risk of growth in foreigners' employability in the grey economy. The current system of employer declaration is unique in Europe and allows for a quick reduction in shortages on local labour markets in periods of economic growth. In the case of growth in the level of unemployment or of economic downturn, its elimination would allow for a very speedy reduction in the scale of immigration.

Ukrainian citizens have remained the largest group of labour immigrants for more than ten years. They constitute about 80–90 per cent of the foreign labour force. Immigrants in Poland usually find employment in sectors in the so-called secondary segment of the labour market – i.e. in construction, agriculture, manufacturing and domestic tasks. Interestingly a gradual increase in the share of foreigners in branches and sectors requiring high specialist qualifications can also be observed. Other countries of which to work for Poland are Moldova and Serbia.

2.6 Conclusion on the issue

Turbulent changes in the labour markets are causing changes in employment policies in the countries of Europe, V4 countries are not an exception. The labour market situation raises the need for reforms throughout the European area.

Issues of labour mobility and labour markets have been among the most contentious discussions on the crowded EU agenda of the past couple years. Visegrad countries (the Czech Republic, Hungary, Poland, and Slovakia) have often found themselves on the defensive. They fear that some of the proposals on labour reform fail to coincide with their economic interests and the principle of the free market, or perceive them as an encroachment of the EU Commission on national competencies. (Kudzko, 2018)

The acute shortage of labour force in some sectors and regions is forcing the V4 governments, usually hostile towards any migration, to make their administrative procedures for employing foreigners less restrictive. At the same time, the ambition is also to lure back those who have left to study or work in Western Europe, so far with mixed results.

Given the widely-held perception, following a series of crises, on the need for reforms, it seems clear that they are bound to happen. But Visegrad countries possess opportunities both to influence the direction of the reforms and to prepare themselves for the future. Efforts need to

be marshalled in several directions – at the EU level and domestically. (Zachová et al., 2018)

As established above, the V4 have legitimate grounds to be worried: a combination of labour market reforms and attempts to rapidly introduce higher social and welfare standards across Europe, including in CEE, might lead to the loss of the competitive advantage of Central European countries, increased unemployment, and the inability of countries to stabilize the labour market and national economies overall. To communicate this situation to Brussels and EU partners effectively, Visegrad countries could intensify constructive diplomatic effort at the EU level.

A faster pace of the reform of labour markets towards harmonizing wages and social contributions across Europe might paradoxically serve as a brutal wake-up call and push the V4 to introduce shock therapy into its effort to develop an alternative growth model that is not focused solely on cheap labour. Most importantly, the V4 cannot afford to lose any time in fostering other sources of competitiveness in addition to their currently cheap labour force. The postponements of reforms afford some extra necessary time but will not help avoid the unavoidable. The transition to a knowledge and innovation-based economy requires a better focus on the new priorities of the labour market. (Kudzko, 2018)

Attracting foreign workers by simplification of the hiring and employing process is common strategy of the V4 countries. But there are also some initiatives aimed at attracting emigrants to return home. Slovak government drafted a plan for a “complex” approach to support possible returnees with a list of measures already taken by various ministries. One of them was a pilot project in the first half of 2018 called “Return to Slovakia” that aimed at high-skilled workers living in the United Kingdom. Numbers of Slovaks who are returning to Slovakia is on the rise and could be a partial solution for the labour shortage problem.

Similarly to Poland, Slovakia is also witnessing a change in its labour migration. For the first time since the outbreak of the economic crisis in 2009, more people came to work in Slovakia than have left in 2016. Last year (2017) the number was even higher, when 15 000 people came to

Slovakia, both native returnees and job seeking foreigners, (analysis based on health insurance companies' data). Despite these positive figures regarding the labour migration, Slovakia still faces massive outflow of students.

In the Czech Republic and Poland there are no state initiatives aimed at labour emigrants, but Hungary tried to attract Hungarians working abroad by pilot program called "Come back home". This campaign was launched in 2015 aiming at people who emigrated to Great Britain and Northern Ireland. The government tried via this project to support resettlement and to find jobs and places to live for Hungarians in the United Kingdom willing to go back home. This programme was funded by 340 000 euros, however, only 105 people came back to Hungary. (Zachová et al., 2018)

3 INCLUSIVE GROWTH IN TERMS OF EMPLOYMENT, EDUCATIONAL ATTAINMENT AND POVERTY REDUCTION IN THE REGIONS OF V4 COUNTRIES

Europe, like many countries around the world, is going through a period of transformation. The global economic crisis disrupted economic and social efforts of many years, revealing several structural weaknesses in the economy, which must be eliminated through structural reforms. Therefore, the European Union and its member states proposed a Europe 2020 strategy to ensure sustainable growth by 2020. The strategy addresses not only the short-term challenges of crisis but also the need for reforms and measures to enhance future growth.

Europe 2020 puts forward three priorities:

- Smart growth – developing an economy based on knowledge and innovation.
- Sustainable growth – promoting a more resource efficient, greener and more competitive economy.
- Inclusive growth – fostering a high employment economy delivering social and territorial cohesion (Páleník et al., 2013).

The following headline targets were set under Europe 2020:

- The employment rate of the population aged 20–64 should increase from the current 69% to at least 75%, including through the greater involvement of women, older workers and the better integration of migrants in the work force;
- Both public and private sectors should invest in research and development. The EU currently has a target of investing 3% in research and development.
- Reduce greenhouse gas emissions by 20% to 30%, increase the share of renewable energy sources in final energy consumption to 20%.
- The drop-out rate of early school leavers should be reduced from the current 15% to 10%.

- The number of Europeans living below the national poverty lines should be reduced by 25%, lifting over 20 million EU citizens out of poverty (Páleník et al., 2015).

Europe 2020 aims on smart, sustainable and inclusive growth. Compared to the previous European Union strategies, inclusive growth has been the key theme to minimize long-term unemployment, reduce poverty, and increase educational attainment of the EU citizens. The main purpose of this chapter is to analyse the potential for inclusive growth in terms of the elimination of unemployment, increase of educational attainment and poverty reduction in NUTS 2 regions in the V4 countries.

3.1 Inclusive growth

Even today, Europe is seeking to alleviate the negative effects caused by the economic crisis. The crisis dramatically slowed down the economic and social growth, and revealed substantial shortcomings in the structural economy as a whole. Globally, fundamental shortcomings are related to environmental protection, increased globalization, aging population, or deepening regional economic and social disparities. Thus, strategies to create a smart, sustainable, inclusive economy with a high level of employment, education and cohesion in the EU need to be developed (Páleník et al., 2013).

History is integral to a correct understanding of inclusive growth. Yet, it is necessary to be familiar with its technical definition and associated terms.

Most institutions regard inclusive growth as a means of achieving sustainable growth. Inclusive growth allows contributing to and benefiting from economic growth (World Bank, 2009). The International Labour Organization defines inclusive growth as a growth ensuring that the benefits of development reach the entire population, including the most vulnerable ones.

Inclusive growth refers both to the pace and pattern of growth, which is considered, interlinked, and therefore in need to be addressed together. The idea that both the pace and pattern of growth are critical for achieving a high, sustainable growth record, as well as poverty reduction, is consistent with the findings in the Growth Report: Strategies for Sustained Growth and Inclusive Development (Commission on Growth and Development, 2008).

Inclusive growth can be approached from a number of perspectives. On the one hand, inclusive growth refers to a system of means to achieve sustainable and stable economic growth. On the other hand, inclusive growth refers to a phenomenon that enables to generate and utilize the results of growth of large portion of population in the regions, while contributing to the equitable development of regions that do not have direct benefits from economic growth (Páleník et al., 2015).

Ianchovichina and Lundstrom (2009) made a comprehensive analysis of inclusive growth from the point of view of poverty and economic growth, and concluded that ineffectiveness of government is the main source of market failures that contributed to weak, inclusive growth in Zambia. Thus, it was confirmed that a high pace of growth over extended periods of time is a necessary, and often the main contributing factor in reducing poverty as found by a sizable body of literature including Deininger and Squire (1998), Dollar and Kraay (2002), White and Anderson (2001), Ravallion (2001) and Bourguignon (2003).

From the regional point of view, inclusive growth refers to the achievement a certain level of economic development over the period under analysis, during which the region or territory have recorded a positive economic growth that does not put the future prosperity of the population in danger. At the same time, larger groups of individuals in society are involved in the process of transformation, creation and utilization of economic growth outcomes (Námešný et al., 2012).

The key function of inclusive growth is to strengthen the role of citizens through investments aimed at creating new jobs, investing in skills, education or social support. Thus, the EU wants to make full use of

the potential of their citizens to address the persistent problems associated with population aging and globalization (Páleník et al., 2015).

As part of inclusive growth, Europe 2020 focuses on the areas as follows:

- employment – changing demography will result in a dramatic drop in labour force,
- skills and education – to enhance employability in the labour market,
- the fight against poverty of working population, marginalized groups of the population or migrants (Námešný et al., 2012).

All these objectives are interrelated. In order to meet them, effective political guidance on establishing mechanisms to achieve the required results in the above areas is needed.

3.2 Poverty and inclusive growth

It is not an easy task to define the concept of poverty with so many scientists researching the issue from various perspectives. Generally, Poverty, individuals or groups are in poverty when they lack resources. Thus, poverty is seen from a social perspective. However, not all social groups are equally vulnerable to poverty. There are certain social groups that are at higher risk of poverty than the others. The most vulnerable groups include low-skilled labour, broken families, the long-term unemployed, Roma population and other marginalized groups (Antman, McKenzie, 2005).

The most general definition for poverty is that by Black (2002) who argues that poverty is an inability to afford an adequate standard of consumption. Bradbury and Jäntti (2003) define poverty as unacceptably low standard of living. Yet, poverty also means lack of finance and other material forms of poverty. Not everything considered to be material poverty is actual poverty (Tvrdoň and Kasanová, 2004). Several authors see poverty as a social phenomenon and, at the same time, as a social and individual problem. However, there is no absolute and generally valid

definition for poverty or for a person to be considered poor (Žilová, 2005).

Poverty and social exclusion are multidimensional phenomena. Just as there is no uniform or correct definition of poverty, there is no generally accepted way of measuring it. Each measurement of poverty means that only a certain concept of poverty is measured (Vlačuha, Kováčová, 2017).

Poverty is a social and economic phenomenon and there is much poverty even in the wealthiest countries of the world. The meaning of poverty, however, does not depend only on its definition and measurement, but also on determining its borders. Thus, poverty is, in the true sense, a "national specificity" that reflects the lifestyle of a given country or its prosperity and wealth (Šimunková, 2001).

Poverty is a multidimensional phenomenon, with different aspects, characterized with lack of income and productive resources that are necessary to have sustainable livelihood, hunger and malnutrition, diseases, limited or no access to education and other basic services, rising mortality and morbidity; homelessness and inadequate housing; unhealthy environment; social discrimination and exclusion (Bredbury, 2003).

In the European Union, the definition by the Council of Europe of December 1984 is used: the poor shall be taken to mean persons, families and groups of persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the member state in which they live (Dennis, Guio, 2004).

Smith et al. (2010) see social inclusion as a process which ensures that those at risk gain opportunities and resources necessary to participate fully in the economic, social and cultural life.

3.3 Trends in V4 countries

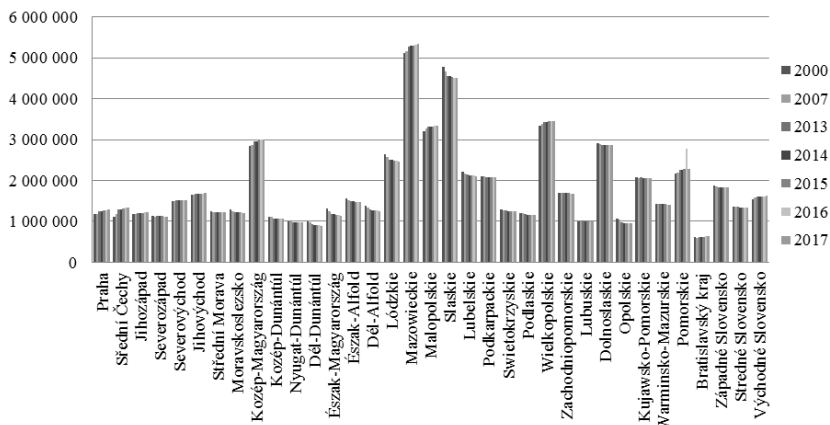
In 2004, the Visegrad countries became members of the European Union. This important step was preceded by the implementation of several pre-accession measures. The second programming period included 11 priorities, including the priority of "Promoting social inclusion, combating poverty and arbitrary discrimination." By combating poverty, social exclusion and discrimination, the European Union with its member states seek to strengthen the inclusive nature and cohesion of European society, and provide their citizens with equal access to available options and resources (Radvanský, Lichner 2013).

Besides their shared history, Visegrad countries have similar socio-economic characteristics and conditions. These were also the reasons why the Visegrad Group was formed. The Visegrad Group has also significantly strengthened their position in the European Community. The countries have been struggling to tackle the deepening disparities. There is, however, the problem of rising numbers of people at risk of poverty. Therefore, the development strategies of the Visegrad Group aim to bring those numbers down.

Despite their common characteristics, there are differences in terms of demography. The Visegrad countries are comparable in terms of economy or standards of living, yet there are pronounced differences in terms of population (Graph 3.1).

Poland is the most populous country of the Visegrad Four (almost 38 million inhabitants) while the lowest population is in the Slovak Republic (5.4 million inhabitants). The most populous regions are the Mazowieckie region (5.3 million inhabitants), Slaskie, Wielkopolskie and Malopolskie regions. The Bratislava region has the lowest number of inhabitants (0.6 million inhabitants). Concerning the population growth in individual regions since 2000, the number of inhabitants rose in some regions (in particular in the regions of Střední Čechy, Mazowieckie, Közép-Magyarország) while the population growth decreased in other regions, in particular in the regions of Slaskie, Łódzkie and Észak-Magyarország.

Graph 3.1: Number of inhabitants in V4 countries by NUTS2



Source: Eurostat, 2018

3.3.1 At risk-of-poverty rate

The Visegrad Four countries have long been working on the elimination of poverty-related problems. They, however, had not been successful in spite of the implementation of various strategies and policies. One of the main indicators in the area of inclusive growth is the poverty risk which refers to the percentage of the population at risk of poverty.

$$H(z) = \frac{\sum_{i=1}^n \mathbf{1}_{y_i < z} w_i}{\sum_{i=1}^n w_i} \cdot 100 \quad (1)$$

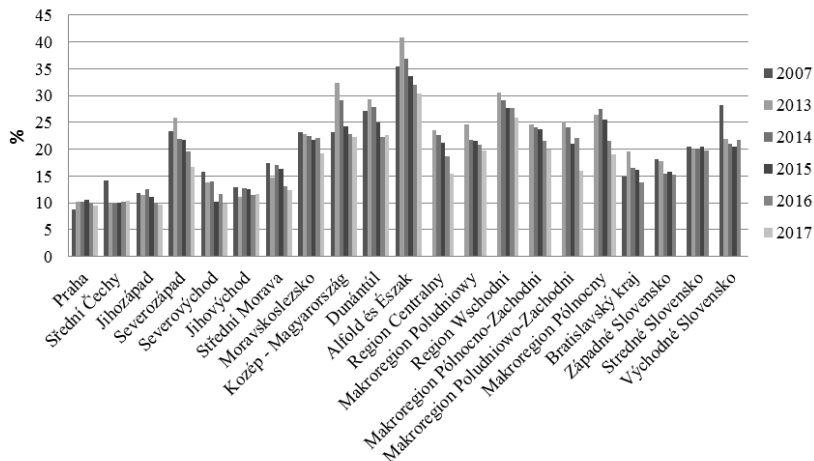
In the European Union, the data on the risk of poverty are available in the EU Statistics on Income and Living Conditions (SILC). This is a sample survey that takes place every year on the basis of a comparable international methodology, allowing not only to analyse the social situation of households in individual countries but also to make international comparisons within the European Union. EU-SILC is a multi-purpose instrument which concentrates primarily on income. Detailed data are gathered on income components, mostly on personal income. However, information on social exclusion and poverty are also included.

At risk of poverty rate is defined as the share of people with a disposable income below 60% of the national median equivalised disposable income. (Statistical Office of the SR, 2018)

Graph 3.2 shows the development of the at-risk-of-poverty rate in individual V4 regions in the analysed period from 2007 to 2017. The data at NUTS2 level are available for the Czech and Slovak regions, and the data at NUTS1 level are available for the regions in Poland and Hungary.

In general, the lowest at-risk-of-poverty rate was recorded in the Czech Republic whereas the highest at-risk-of-poverty rate was found in Hungary. From the regional point of view, the lowest at-risk-of-poverty rate was in the Praha region (the Czech Republic) while the highest at-risk-of-poverty rate has long been in the Hungarian region Alföld és Észak (reaching 40.8% in 2013). In terms of the development of at-risk-of-poverty indicator, it decreased sharply in the analysed period from 2007 to 2017. Therefore, it can be concluded that the implemented tools to alleviate poverty are effective.

Graph 3.2: At-risk-of-poverty rate in V4 countries (%)



Source: Eurostat, 2018

3.3.2 Unemployment rate and regional differences in unemployment rates in V4 countries

The unemployment rate is another important indicator of inclusive economic growth. **Unemployment** is the first and foremost problem of market economy. It is a negative phenomenon in the economy which is associated with labour market imbalances. Martincová (2005, p. 431) defines unemployment as a situation in the labour market where someone of working age is not able to get a job but would like to be in employment. It means that human resources are not being used to produce goods and services. The high level of unemployment has very adverse economic and social consequences.

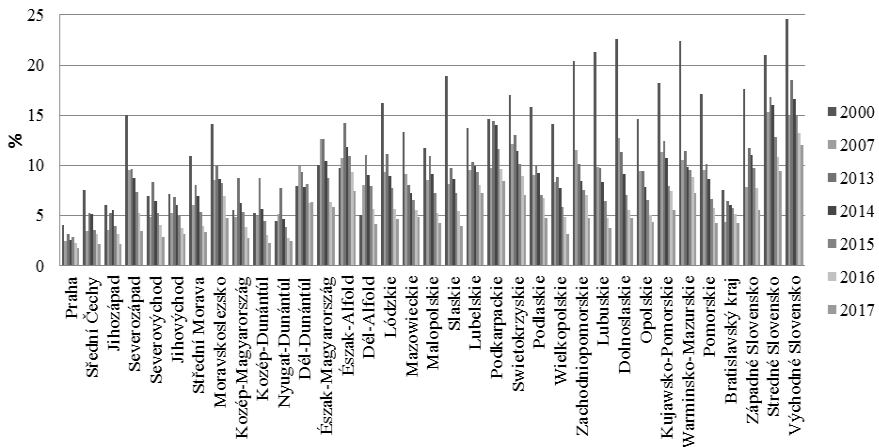
In the European Union, the issue of unemployment is paid close attention by society, politicians and professionals. Unemployment affects adversely not just the unemployed but also the entire society. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. available for work at the time (i.e. were available for paid employment or self-employment before the end of the two weeks following the reference week); 3. actively seeking work (i.e. had taken specific steps in the four-week period ending with the reference week to seek paid employment or self-employment), or who found a job to start within a period of at most three months. The unemployment rate shows unemployed persons as a percentage of the economically active population. (Eurostat, 2017)

Unemployment is watched through an unemployment rate defined as the percentage of unemployed workers in the total labour force.

$$u = \frac{U}{L} \cdot 100 \quad (2)$$

Graph 3.3 shows the development of unemployment rates in V4 countries at NUTS 2 level.

Graph 3.3: Unemployment rates in V4 countries at NUTS 2 level (%)



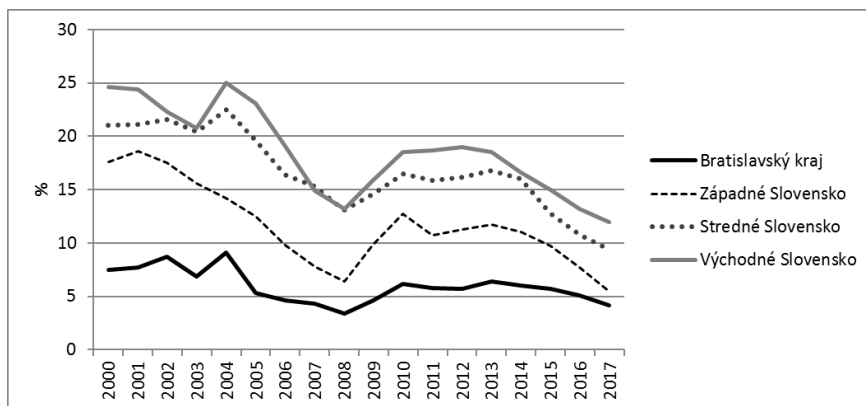
Source: Eurostat, 2018

The Graph shows fluctuations in unemployment rates over 2000-2017. The highest unemployment rates were recorded from 2001 to 2005. In the following years, the unemployment rates declined, and rose from 2008 as a result of the global economic crisis. The unemployment rates, however, never reached the high levels of unemployment in the period from 2001 to 2005.

In V4 countries, the Czech Republic had the lowest unemployment rate; only 1.9% unemployment rate was recorded in the region of Praha in 2008. Low unemployment rates were recorded in other regions of the Czech Republic (Střední Čechy, Jihozápad). The highest unemployment rates were found in Poland (from 2002 to 2004, the unemployment rate did not fall below 26% in the regions of Zachodniopomorskie and Dolnoslaskie) and in the Slovak Republic (the unemployment rate did not fall below 25% in the region of Východné Slovensko in 2004). In Hungary, the regions of Észak-Magyarország and Észak-Alföld have been affected most by unemployment.

The trends in unemployment rates in V4 countries were analysed. The Graph 3.4 shows the development of unemployment rates in the regions of the Slovak Republic. The Graph 3.5 shows the development of unemployment rates in the regions of the Czech Republic.

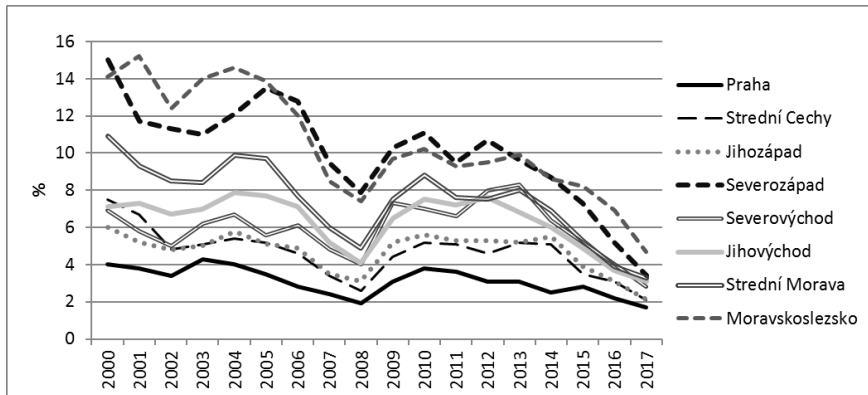
Graph 3.4: Development of unemployment rates in the regions of the SR (%)



Source: authors' own elaboration on Eurostat data

In the regions of the Slovak Republic, the unemployment rate fluctuated, with a downward trend following 2004 and 2012. There are considerable differences in unemployment rates across the regions of Slovakia. The highest unemployment rate was recorded in the region Východné Slovensko in 2004 (25.0%). Throughout the analysed period, the lowest unemployment rate was in the Bratislava Region (merely 3.4% in 2008).

Graph 3.5: Development of unemployment rates in the Czech regions (%)



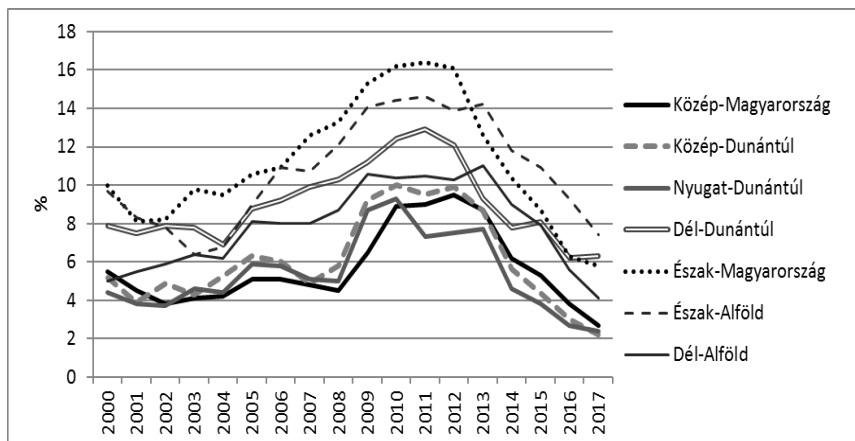
Source: authors' own elaboration on Eurostat data

With regard to unemployment rates, the Czech Republic was in a more advantageous position than the Slovak Republic. Unemployment rates fluctuated in the regions of the Czech Republic, with a downward trend after 2004. However, unemployment rates went up in all the Czech regions during the recession. Kotýnková and Kubelková (2012, p. 79) argue that low performance of the economy went hand in hand with a decrease in jobs, mainly due to poor sales of products in domestic and foreign markets. The recession year of 2009 brought a rise in unemployment due to the decrease in jobs.

In the Czech Republic, the most affected regions are the regions of Moravskoslezsko and Severozápad in which the unemployment rate was high, especially until 2006. The lowest unemployment rate is in the Praha region (only 1.9% in 2008; 1.7% in 2017).

The recession of 2008 also influenced the labour market trends in Hungary (Graph 3.6) and Poland (graph 3.7).

Graph 3.6: Development of unemployment rate in Hungarian regions (%)



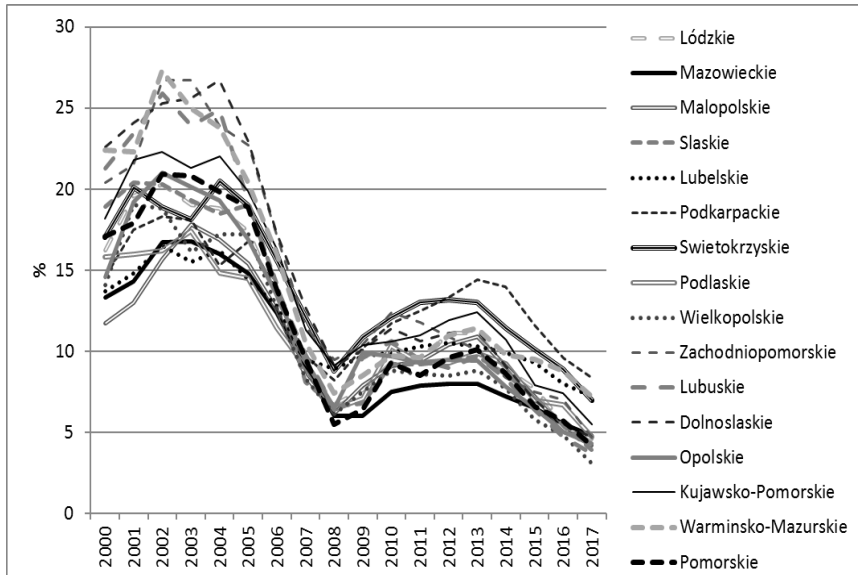
Source: authors' own elaboration on Eurostat data

In Hungary, the unemployment rate was quite low at the beginning of the analysed period. From 2002, however, the unemployment rate was going up. The highest unemployment rate of 16.4% was recorded in the Észak-Magyarország region in 2011. In the following years, the unemployment rate dropped below 10%. From 2003 to 2010, the lowest unemployment rate was recorded in the region Közép-Magyarország. In the following years, the lowest unemployment rate was recorded in Nyugat-Dunántúl region, and Közép-Dunántúl region in 2017 (2.2 %).

In Poland, the unemployment rate was on the rise from 2000 to 2003, and some regions recorded an unemployment rate above 25% (Zachodniopomorskie, Warminsko-Mazurskie, Dolnoslaskie, and Lubuskie). The Polish labour market was greatly influenced by the labour markets of other EU member states, and in particular by gradual opening up of western labour markets to the Polish job-seekers. From 2003 to 2008, the unemployment dropped dramatically, ranging from 5-10% in the regions. Spišáková and Pétrová (2011, p. 243) argue that

unemployment decreased can also be attributed to foreign direct investment inflow to Poland, thus creating new jobs. Following 2008, the unemployment rate went up, and dropped after 2013. Towards the end of the analysed period, the lowest unemployment rates were recorded in the regions of Opolskie, Wielkopolskie and Lubuskie.

Graph 3.7: Development of unemployment rate in Polish regions (%)

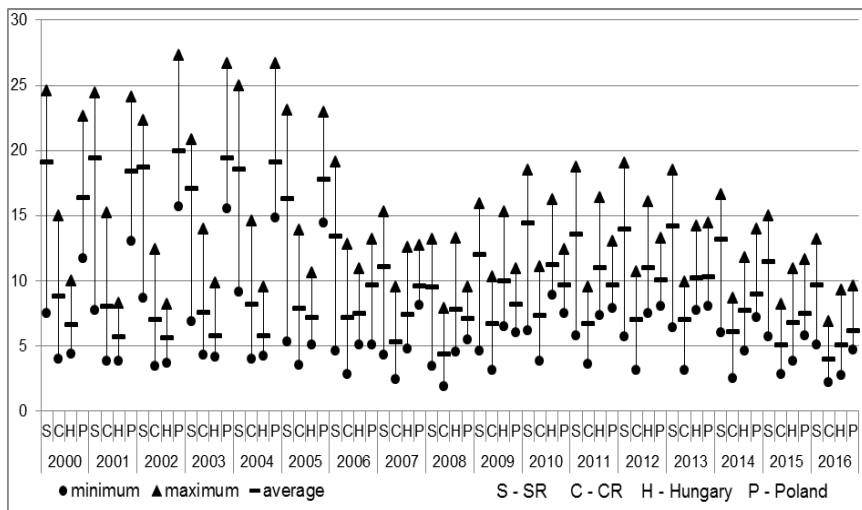


Source: authors' own elaboration on Eurostat data

Regional unemployment rates in V4 countries

Graph 3.8 illustrates the development of minimum, maximum and average unemployment rates (in %) in V4 countries and range (percentage points).

Graph 3.8: Absolute indicators of unemployment rate variability in V4 countries



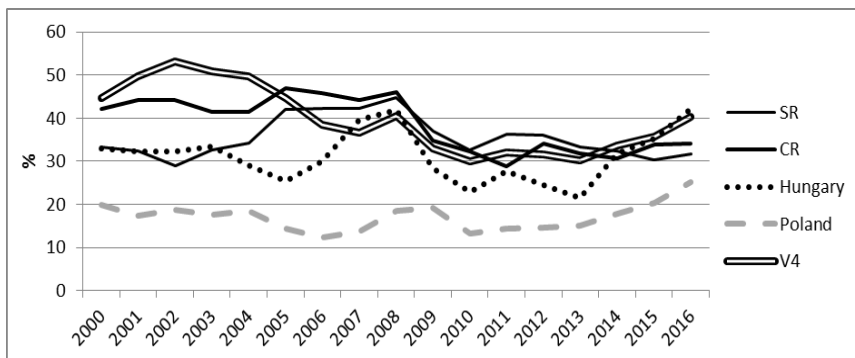
Source: authors' own elaboration, own calculations on Eurostat data (2018)

The data clearly show that the biggest absolute differences in unemployment rates in V4 countries were from 2000 to 2005. Following 2005, the differences alleviated to increase after the recession of 2009. From then on, the differences were reduced. Almost throughout the entire analysed period, the highest unemployment rate was recorded in the Slovak Republic (mostly in the region of Východné Slovensko), and in Poland (Zachodniopomorskie and Dolnoslaskie regions) from 2002 to 2004. During the entire analysed period, the lowest unemployment rate was recorded in the region of Praha, with the exception of 2003, when the lowest unemployment rate was in the Hungarian region of Közép-Magyarország. During the entire analysed period, the biggest variation in unemployment rates was found in the Slovak Republic (reaching 17.8 p.p. in 2005). From 2000 to 2006, the lowest variation in unemployment rates was found in Hungary, from 2006 to 2013 in Poland, and from 2013 in the Czech Republic.

Graph 3.9 shows the relative differences in unemployment rates (coefficient of variation in %) in the Visegrad Four countries from 2000 to 2016.

Minor relative differences in unemployment rates were found in the regions of Poland. These differences, however, increased from 2010. The biggest differences were identified in the regions of the Czech Republic and Slovakia, and Hungary in the last two years of the analysed period. All in all, the differences in V4 countries diminished, differences in unemployment rates declined after 2008, but increased towards the end of the analysed period.

Graph 3.9: Relative differences in unemployment rates (%) in V4 countries



Source: authors' own elaboration, own calculations on Eurostat data (2018)

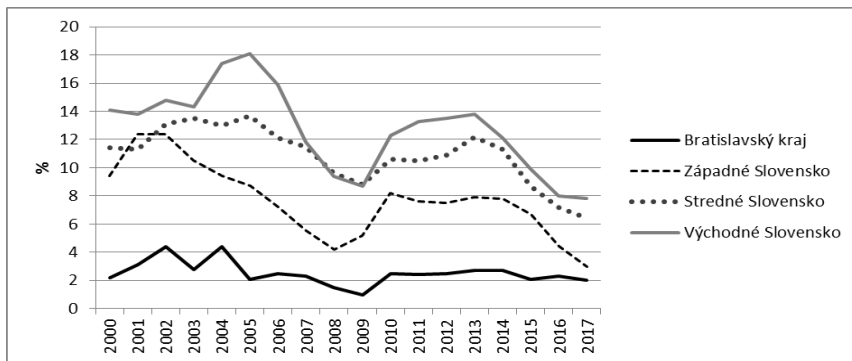
3.3.3 Long-term unemployment rate in the regions of V4 countries

Long-term unemployment or unemployment longer than one year has negative economic, social and psychological consequences for society and affected individuals. Long-term unemployment reflects structural changes in the labour market, regional disproportions in the supply of and demand for work or labour migration. Long-term unemployment has devastating effects on both the unemployed and an

economy. Long-term unemployment means lower employability of unused labour resources, costs to government and society in general, costs for the reintegration of unemployed people into the labour market, and even their social exclusion.

The development of long-term unemployment is examined on the basis of the long-term unemployment rate, which is the percentage of the number of long-term unemployed in the total number of economically active population. In the text below, trends in long-term unemployment in V4 countries will be examined. The development of long-term unemployment rate in Slovak regions at NUTS2 level is shown in Graph 3.10. In the process of economy transformation, the rise of unemployment goes hand in hand with the rise of long-term unemployment. Since then, long-term unemployment has been a major problem in the Slovak labour market.

Graph 3.10: Development of long-term unemployment rate in the SR (%)



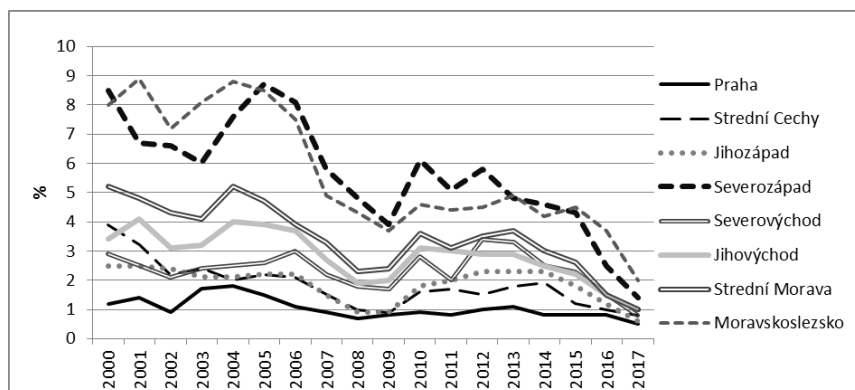
Source: authors' own elaboration on Eurostat data

In the Slovak Republic, the evolution of unemployment had also an impact on the evolution of the long-term unemployment. The highest long-term unemployment rate was recorded in the Východné Slovensko region - up to 18.1% in 2005. In the coming years, the unemployment

rate kept decreasing. It, however, increased to 13.8% in 2013 due to the economic crisis. The lowest long-term unemployment rate is in the region of Bratislava, only 1% in 2009. In 2017, the long-term unemployment rate dropped significantly and ranged from 2 to 8%.

The development of the long-term unemployment rate in the regions of the Czech Republic follows the development of the unemployment rate. The development of long-term unemployment rate in the Czech regions is shown in Graph 3.11.

Graph 3.11: Development of long-term unemployment rate in the CR (%)

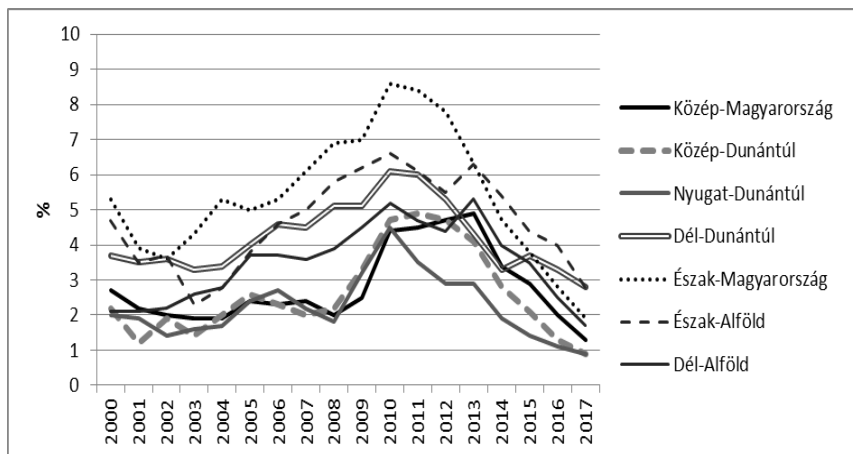


Source: authors' own elaboration on Eurostat data

In the Czech Republic, long-term unemployment rate was the highest in 2001, 2004 and 2005, when it stood almost at 9% in the region of Moravskoslezsko. The worst regions for unemployment were the region of Moravskoslezsko situation was in 2001-2004 and 2015-2017 in the Moravskoslezsko, in the other years in the Severovýchod region. The best region for long-term unemployment was the Praha region where the unemployment rates stood below 2%, and towards the end of the analysed period even below 1%

Graph 3.12 shows the development of long-term unemployment rate in Hungarian regions.

Graph 3.12: Development of long-term unemployment rate in Hungary (%)



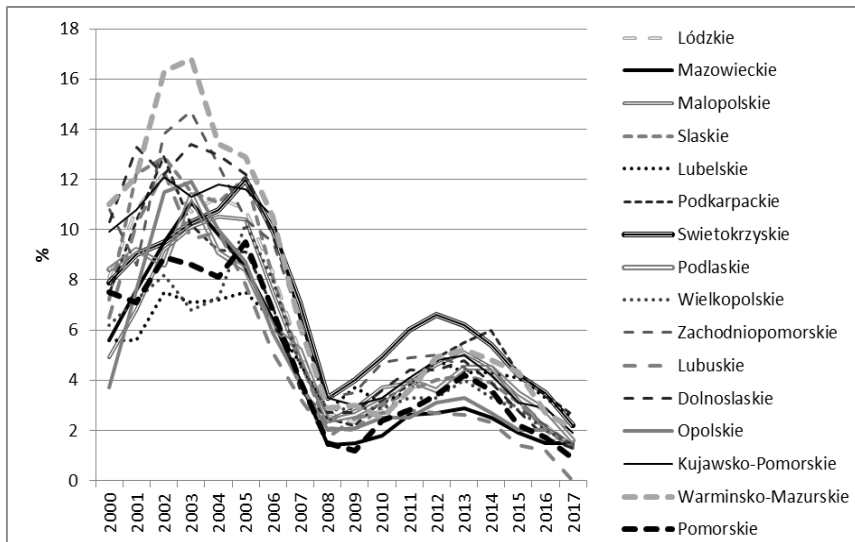
Source: Eurostat, authors' own elaboration

In Hungary, an increase in unemployment goes hand in hand with rising long-term unemployment rates. Long-term unemployment rate was rising until 2010. From 2010, it was going down. Regions with the highest unemployment rates are also mostly affected by long-term unemployment, in particular the Észak-Magyarország region where the long-term unemployment rate increased from 5.3% in 2000 to 8.6% in 2010. Following 2010, long-term unemployment rate decreased sharply in this region (to 1.9% in 2017). Least affected by long-term unemployment was the region of Nyugat-Dunántúl, in which the long-term unemployment dropped to 0.9% in 2017.

Graph 3.13 illustrates the development of long-term unemployment in Polish regions.

In Poland, the evolution of long-term unemployment rates and unemployment rates was alike. In the first years of the analysed period, the rate of long-term unemployment increased, and then went down. From 2008, the long-term unemployment rate increased moderately to decline slightly after 2012.

Graph 3.13: Development of long-term unemployment in Poland (%)

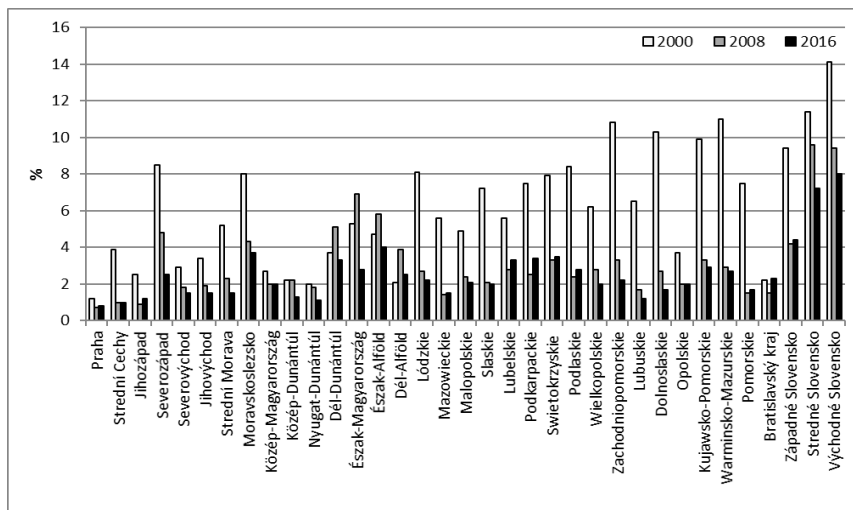


Source: Eurostat, authors' own elaboration

Long-term unemployment mostly struck the region of Warmińsko-Mazurskie, where the long-term unemployment hit 16.8% in 2003, then fell to 2.9% in 2008. Following 2008, the long-term unemployment rate was rising, and falling again after 2013. In the early years of analysed period, high long-term unemployment rate was recorded in the regions of Zachodniopomorskie and Dolnoslaskie, and Swietokrzyskie and Podkarpackie in 2012. In 2001, the lowest long-term unemployment rate was in the region of Lubelskie (5.6%). Towards the end of the analysed period, the lowest long-term unemployment rate was recorded in the regions of Opolskie and Pomorskie.

The comparison of long-term unemployment rates in V4 countries at NUTS2 level in 2000, 2008 and 2016 is shown in Graph 3.14.

Graph 3.14: Comparison of long-term unemployment rates in V4 countries (%)



Source: authors' own elaboration on Eurostat data

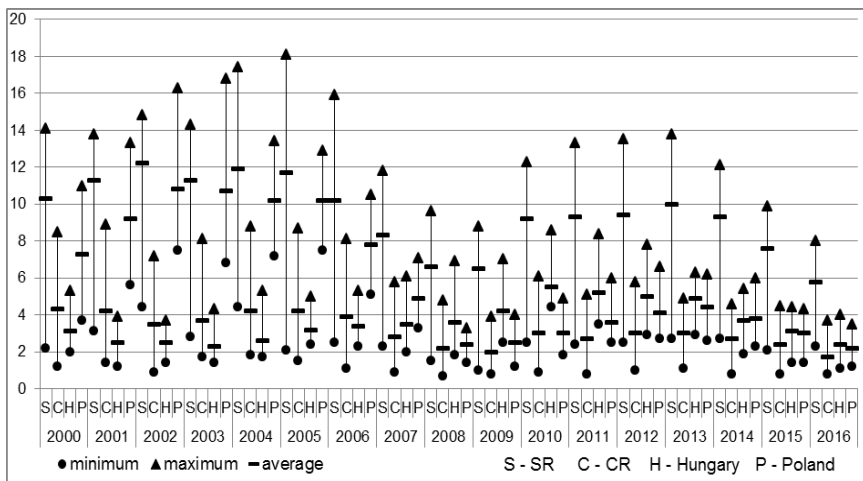
As shown by the Graph 3.14, the highest long-term unemployment rate was in the Slovak Republic (region of Východné Slovensko), followed by several Polish regions. In most of the V4 regions, the highest long-term unemployment rate was in 2000, with the exception of some Hungarian regions.

Differences in long-term unemployment rates in the regions of V4 countries

The key negative consequence of long-term unemployment is the low employability of long-term unemployed in the labour market. To put it in another way, those people able, available and willing to work are not being used. Thus, the unemployed are losing their skills, the habits of work, and ability to learn new skills. Unemployment is detrimental to health and social status of unemployed people. Páleník et al. (2014) make a list of several factors affecting low employability of those being out of work for a long time, such as for instance the concentration of long-term jobless in low performing regions. In some regions, one third of the

economically active population are long-term unemployed. Such a massive exclusion from the labour market has far-reaching implications for the economy and social cohesion of regions which dramatically reduces the effectiveness of some policies and tools. Thus, businesses are not to be able to find qualified labour. Again, the indicators of absolute differences in long-term unemployment (minimum, maximum, average and variation range) in the regions of V4 countries were observed (compare Graph 3.15).

Graph 3.15: Absolute indicators of long-term unemployment rate variability



Source: authors' own elaboration, own calculations on Eurostat data (2018)

Absolute differences in long-term unemployment rates in the V4 regions are considerable, mainly due to the high rates of long-term unemployment in the Slovak Republic, particularly in the regions of Východné Slovensko and Stredné Slovensko. These differences were slightly alleviated from 2008 to 2009 and in 2016.

Throughout the entire analysed period, the highest long-term unemployment rate was in the SR (in the region of Východné Slovensko, in the region of Stredné Slovensko in 2008 and 2009). The exception was

the years of 2002 and 2003, when the highest long-term unemployment was recorded in the Polish region of Warminsko-Mazurskie. The lowest long-term unemployment was recorded in the region of Praha, except for 2001 and 2003, when it was the lowest in the region of Közép-Dunántúl, and except for 2004 when the lowest long-term unemployment was recorded in the region of Nyugat-Dunanthal.

The variation in the long-term unemployment rate was oscillating, the highest values were found in the SR, in 2005 - 16 p.p. The lowest variation range in long-term unemployment rates was in 2000-2005 and 2013-2014 in Hungary, and in Poland towards the end of the period under analysis.

In addition to absolute differences in unemployment rates, relative differences (coefficient of variation in %) in V4 countries over the period from 2000 to 2016 were computed (compare Graph 3.16).

Graph 3.16: Relative differences in long-term unemployment rates (%)



Source: authors' own elaboration, own calculations on Eurostat data (2018)

From 2000 to 2016, the differences in long-term unemployment rates evolved irregularly in V4 countries. The biggest differences were recorded in 2008. Regarding the comparison of regional differences across V4 countries, the largest variation in long-term unemployment

rates was observed in the Czech Republic (2008: 65.89%). The Czech Republic was followed by the Slovak Republic with a variation in long-term unemployment rates below 40% towards the end of the analysed period. The largest fluctuations were observed in Hungary: 52.43% in 2008, and only 23.2% in 2013. The lowest variation in long-term unemployment rates was found in Poland. The variation tended to increase moderately towards the end of the analysed period.

3.3.4 Educational attainment

The promotion of inclusive community goes hand in hand with an array of demographic indicators. One of them is the level of education attained whereas its improvement ranks among the key priorities of the Europe 2020 strategy. In terms of educational attainment, the European issues are early leavers in primary education and a relatively high proportion of population that has attained primary education.

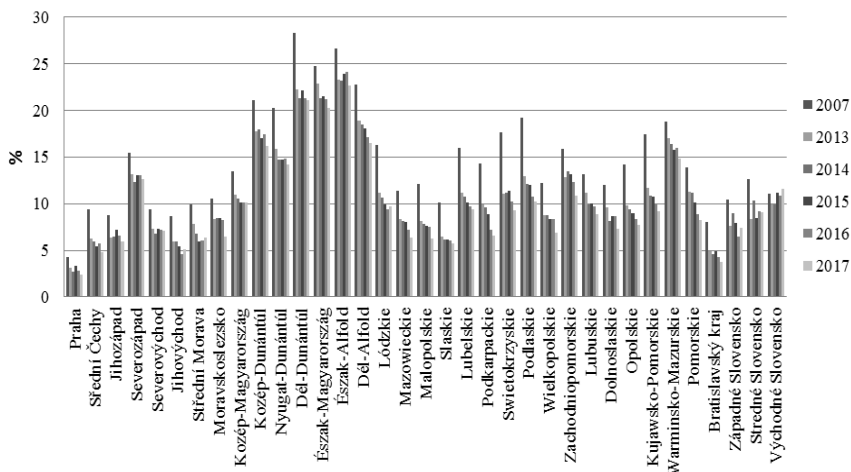
$$EPS(r) = \frac{1}{r - \sum_{k=0}^r f_k} \quad (3)$$

In order to identify the problems associated with a low level of education of the EU population, the statistics on the population aged 25-64 years with a primary education is provided.

Graph 3.17 shows the statistics on the population aged 25-64 years with a primary education.

The highest proportion of population with educational attainment of below secondary education was in Hungary, specifically in the regions of Dél-Dunántúl (28.3% in 2007) and Észak-Alföld. The lowest proportion of population with educational attainment of below secondary education was found to be in the Czech Republic (the region of Praha: below 5%); Slovak Republic (the Bratislava region and the region of Západné Slovensko). In the Polish regions, the share of population with a primary education went down substantially, e.g. to 5.7% in the region of Slaskie in 2017. All in all, there was a considerable decrease in the numbers of population with a primary education in the majority of V4 regions.

Graph 3.17: Population aged 25-64 years with a primary education (%)



Source: Eurostat, 2018

Tertiary education in V4 regions

As mentioned earlier, education plays a significant role in the societal development. Education helps improve the standard of living and quality of life. *Tertiary education* can substantially contribute to sustainable economic growth and human capital development. According to Eurostat (2018), tertiary builds on secondary education. It is offered by universities and other institutions of higher education. Societies are well aware of the significant role that tertiary education is playing in innovation, economic development and growth as well as in increasing human well-being. The European Commission encourages the member states to invest in education for future growth and employment and a more inclusive Europe.

After political changes of 1989, the V4 countries had to transform their centrally-planned economies to market economy. Today, the educational attainment of the population also reflects the countries' competitiveness. Higher education reforms led to an increase in the

numbers of students and institutions of higher education. The reforms were of qualitative nature, especially in the processes of founding private institutions of higher education institutions and implementing new systems of study (Nestorová-Dická, 2013). The Bologna process and the creation of a Europe of Knowledge restructured the system of higher education in Central and Eastern European countries. By 2005, all V4 countries had participated in the Bologna process.

In 2000, the largest share of population with tertiary education was in Hungary (11.2%) and the lowest share was in the Slovak Republic. From 2000 to 2016, the number of population with tertiary education was growing at the fastest pace in Poland (2.685). Towards the end of the analysed period, the largest share of population with tertiary education was recorded in Poland (23.9%). The second fastest growth was in the Slovak Republic (2,405). Throughout the analysed period, the lowest share of population with tertiary education was in the Slovak Republic. The slowest increase in the number of population with tertiary education was in Hungary (1.786%).

According to Eurostat (2018), the government expenditure on tertiary education in Poland, Slovakia and Czech Republic ranged from 3.84% to 4.91% of GDP in 2014. The highest government expenditure on tertiary education was in Poland (4.91% of GDP), and the lowest in the Czech Republic (3.84% of GDP). In Slovakia, the government expenditure on tertiary education amounted to 4.09% of GDP. Hungary did not make the data on government expenditure on tertiary education available for 2014. In 2013, the expenditure was 3.93% of GDP. In Slovakia, the expenditure on tertiary education was rising from 2012, in the Czech Republic the expenditure was going down and in Poland it was stagnating.

The shares of population with tertiary education in V4 countries are shown in Table 3.1.

Table 3.1 Shares of population with tertiary education in V4 countries (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Czech Republic	9,3	9,4	9,6	9,7	10,1	10,7	11,1	11,3	12,1	13,1	14,1	15,3	16,3	17,3	18,0	18,7	19,4
Hungary	11,2	11,1	11,3	12,4	13,6	14,0	14,6	14,9	15,8	16,3	16,5	17,5	18,5	19,0	19,8	20,2	20,0
Poland	8,9	9,3	9,7	11,0	12,2	13,5	14,4	15,1	16,0	17,4	18,6	19,5	20,6	21,6	22,7	23,3	23,9
Slovak Republic	7,9	8,2	8,3	9,0	10,0	11,0	11,6	11,5	12,0	13,1	14,6	15,8	16,4	17,1	17,4	18,3	19,0

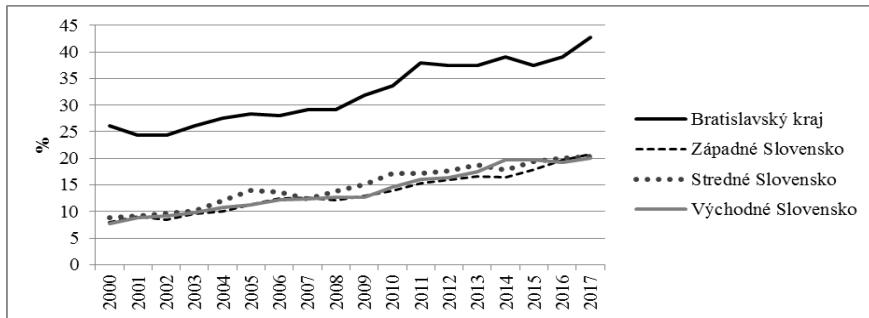
Source: Eurostat, 2018

In V4 countries, there were significant regional differences in indicator values. In 2000, the highest share of persons with tertiary education were in the Bratislava region (21%), the region of Praha (20.7%), the Hungarian region of Közép-Magyarország (17.2%, NUTS 2013), and the Polish region of Mazowieckie (11.8%, NUTS 2013). All four regions are the regions around the V4 capitals. In 2016, the situation was similar, yet the ranking was different.

The highest share of persons with tertiary education was in the region of Praha (37.6%), followed by the Bratislava region (34.2%), Polish region of Mazowieckie (32.2%, NUTS 2013), and the Hungarian region of Közép-Magyarország (30.1%, NUTS 2013). In 2000, the lowest share of persons with tertiary education was in the Slovak regions of Východné Slovensko and Západné Slovensko (5.9%). In 2016, the lowest share of persons with tertiary education was in the Czech region of Severozápad (11.4%).

The development of the share of population with tertiary education in the regions of V4 countries at NUTS2 level is given in Graph 3.18 (Slovakia), Graph 3.19 (Czech Republic), Graph 3.20 (Hungary), and Graph 3.21 (Poland).

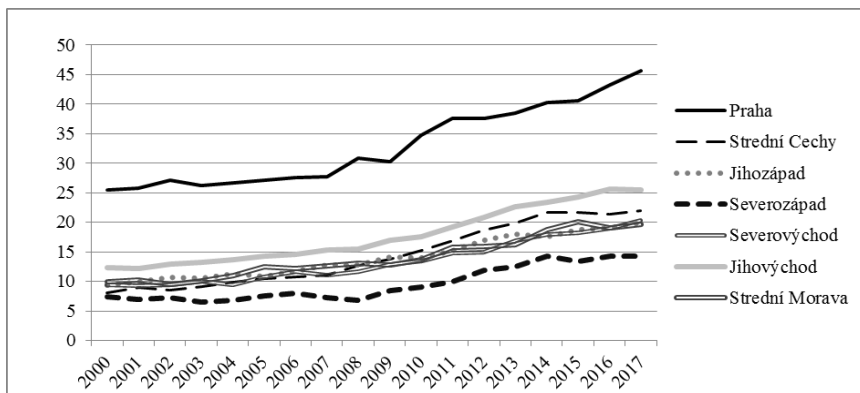
Graph 3.18: Share of population with tertiary education in Slovak regions at NUTS2 level (%)



Source: Eurostat 2018, authors' own elaboration

In the Slovak Republic, the highest share of persons with tertiary education was in the Bratislava region, an increase from 26.1% in 2000 to 42.7% in 2017. There was a wide gap among the Bratislava region and other regions at NUTS2 level, but not among Západné Slovensko, Stredné Slovensko and Východné Slovensko. In these regions the rate of persons with tertiary education was increasing, reaching the rate of 20% in 2017.

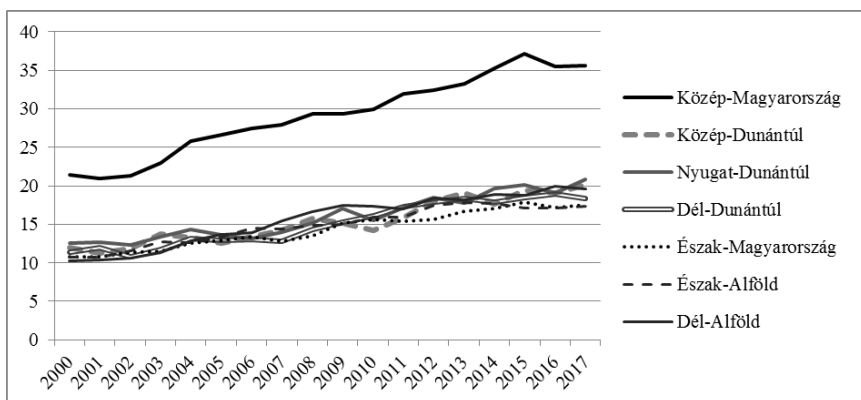
Graph 3.19: Share of population with tertiary education in Czech regions at NUTS2 level (%)



Source: Eurostat (2018), authors' own elaboration

In the Czech Republic, the highest share of persons with tertiary education was in the region of Praha (45.6% in 2017). There was a wide gap among the regions. In 2017, the difference was 20 pps. With regard to other regions, the share of persons with tertiary education reached 25% in the region of Jihovýchod. The worst situation had long been in the region of Severozápad (15% in 2017).

Graph 4.20: Share of population with tertiary education in Hungarian regions at NUTS2 level (%)

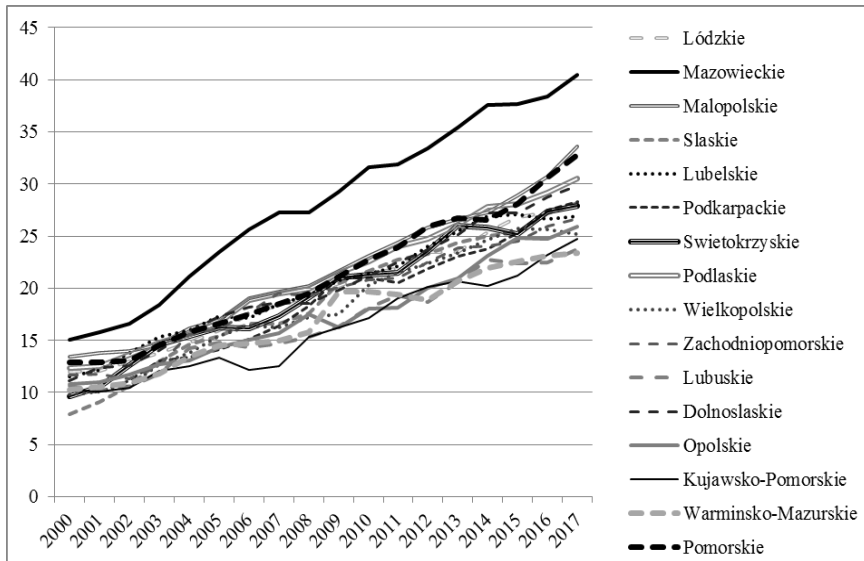


Source: Eurostat (2018), authors' own elaboration

As in other V4 countries, the highest share of persons with tertiary education (37.1%) was in the region around the capital city (Közép-Magyarország) in 2015. Differences between other regions were marginal (in 2017 – the share ranges from 17.4% to 20.8%), but the gap between the region of Közép-Magyarország and other regions is widening - 15 p.p. towards the end of the analysed period.

Also in Poland, the highest share of persons with tertiary education was in the region around the capital city, the region of Mazowieckie (2017, 40.5%). The gap between the region of Mazowieckie and other regions was not that large as in the remaining V4 countries, and interregional differences were bigger. In the region of Pomorskie, the share of persons with tertiary education went up to 32.8%, and in the region of Warminsko-Mazurskie reached only 23.4% in 2017.

Graph 3.21: Share of population with tertiary education in Polish regions at NUTS2 level (%)

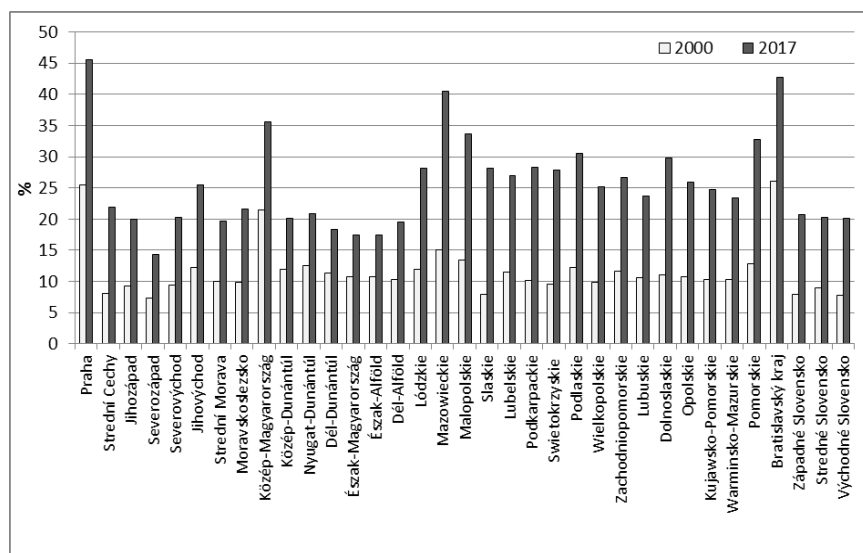


Source: Eurostat (2018), authors' own elaboration

Graph 3.22 shows the shares of persons with tertiary education in V4 countries at NUTS2 level in the first (2000) and last (2017) year of analysed period.

The above Graph clearly shows that the share of persons with tertiary education was highest in the regions of Praha, Bratislava, Mazowieckie and Közép-Magyarország. The Polish regions have higher share of persons with tertiary education than other V4 regions. Since 2000, however, the numbers of persons with tertiary education increased significantly in all V4 countries.

Graph 3.22: Shares of persons with tertiary education in V4 countries at NUTS2 level (%)



Source: Eurostat (2018), authors' own elaboration

3.3.5 Trends in employment by educational attainment in V4 countries

Human resource development is a must in building knowledge-based societies and economies. In this sense, continuous education and lifelong learning are encouraged (Sahadev and Demirbag, 2011). In general, higher-education graduates have a better chance of getting jobs. Table 3.2 shows that the employability of those with tertiary education is the highest in all V4 countries. In this case, tertiary education includes both tertiary and tertiary vocational education, as well as postgraduate education. The analysed time series was from 2007 to 2016. For purposes of comparison, the data from 2000 were listed.

Table 3.2 Trends in employment rates of 25-64 year-olds, by educational attainment

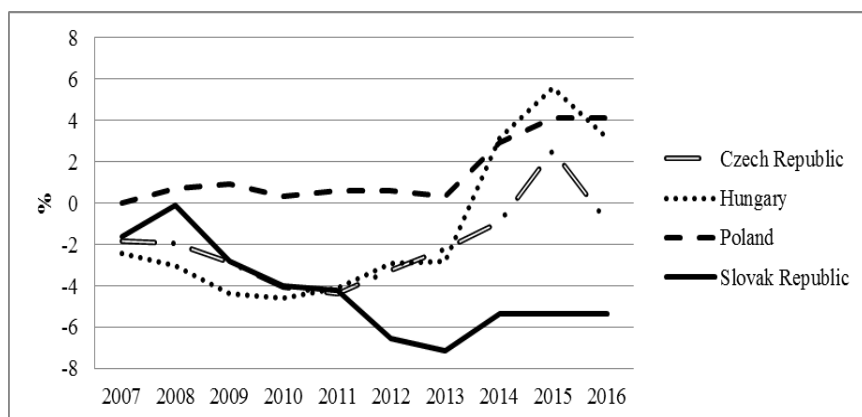
Country	educational attainment	2000	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Czech Republic	Below upper secondary	46.9	45.7	46.5	43.9	43.2	43	41	41.8	44	43	45
	Upper secondary and post-secondary non-tertiary	75.5	76.1	76.6	75.1	74.5	78	79	76.6	78	79	81
	Tertiary education	86.8	85.2	85.1	84.3	83.3	83	84	84.9	86	89	86
Hungary	Below upper secondary	35.8	38.5	38.7	37.4	37.6	40	41	39.4	47	50	52
	Upper secondary and post-secondary non-tertiary	72.1	70.2	68.7	67.0	66.2	68	70	69.0	78	81	76
	Tertiary education	82.4	80.4	79.9	78.8	78.6	79	80	80.1	85	87	85
Poland	Below upper secondary	42.8	41.0	43.0	41.6	39.9	40	40	38.5	40	46	41
	Upper secondary and post-secondary non-tertiary	66.6	65.2	67.0	66.3	65.6	69	69	65.2	66	70	68
	Tertiary education	84.5	84.5	85.1	85.3	84.8	85	85	84.8	87	88	88
Slovak Republic	Below upper secondary	30.9	29.1	32.3	30.3	29.7	32	32	31.0	31	36	38
	Upper secondary and post-secondary non-tertiary	70.6	73.2	74.8	72.0	69.9	74	75	69.9	75	74	74
	Tertiary education	85.6	84.2	85.5	83.2	82.2	82	80	79.5	81	81	81

Source: authors' own elaboration on: Education at a Glance 2011-2017 OECD Indicators

Over the entire period, the highest employment rate is recorded by all countries with highest educational attainment, ranging from 78.6% to 89%. Those with higher levels of education are more likely to be employed. Over the years of economic crisis in 2009 and 2010, the employment rate went down in all levels of education, such as below upper secondary, upper secondary and post-secondary non-tertiary and tertiary education. The highest employment rate of those with tertiary education was recorded in the Czech Republic in 2015. There was, however, an 88% employment rate of tertiary educated persons in 2015 and 2016 in Poland. The lowest rates of 80% were recorded in Hungary from 2008 to 2011. Having used a base index to observe the development of employment rates of those with tertiary education, the least good

developments were found in Slovakia compared to the base year of 2000. The worst situation in the Slovak Republic was in 2013 when the employment rate fell by 7.13 p.p. and stagnated in 2015 and 2016. On the other hand, the development was better in other V4 countries. The best development was in Poland, although Hungary was one step ahead (4.14 p.p.) in 2015, which recorded an increase of up to 5.6 p.p. Poor developments were recorded in the Czech Republic where the employment of tertiary educated persons kept dropping after 2015.

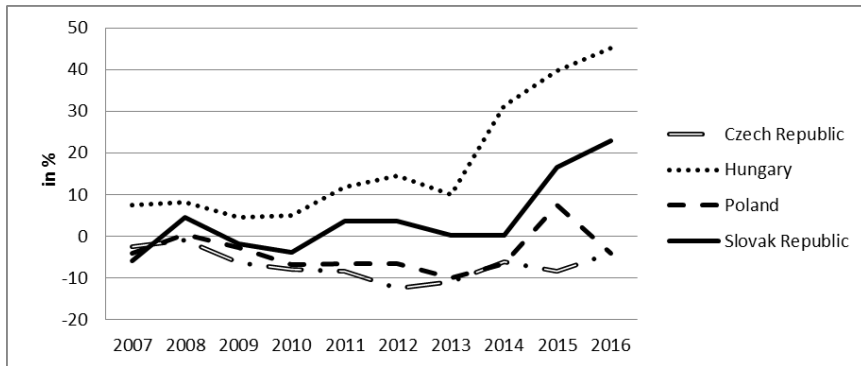
Graph 3.23: Development of base index of employment in tertiary education in %



Source: authors' own elaboration

On the other hand, the category of persons with the lowest education is most vulnerable to political decisions and particularly economic fluctuations, since the employment rate in this category ranges from 29.1% (2007) in Slovakia to 52% (2016) in Hungary. The worst situation in the employment of those with the lowest education was in Slovakia. Although improvements had been made, the employment rate never went above 40% throughout the analysed period.

Graph 3.24: Development of employment base index in below upper secondary education in %



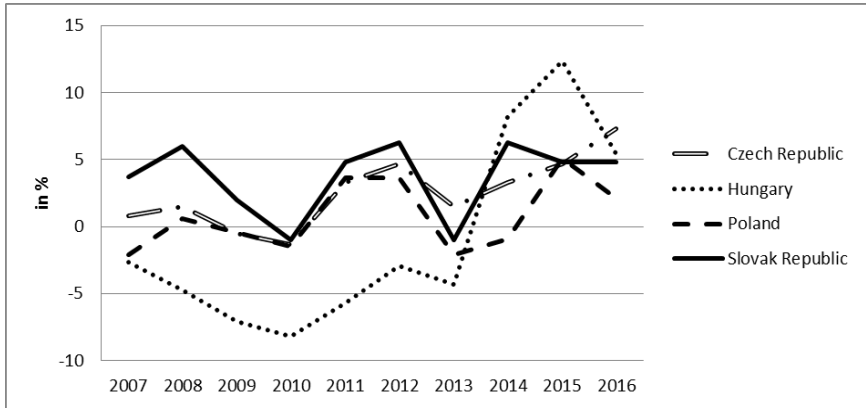
Source: authors' own elaboration

The development of the employment base index of people with the lowest level of education was poor in the Czech Republic, where it decreased by 12.6 p.p. in 2012. The indicator developed best in Hungary, where employment increased by 45.25 p.p. in 2016, and in Slovakia by 22.97 p.p.

Table 3.2 shows that employment rates of those with secondary education ranged from 65.2% (Poland 2007, 2013) to 81% (Czech Republic 2016). The situation for employees with completed secondary education is the best in the Czech Republic. The lowest employment rate of 70% was recorded in 2015 in Poland. In Slovakia, the situation was relatively stable, the employment rate fell slightly below 70% in 2010 and 2013 (69.9%).

Graph 3.25 shows the basic employment index in this group of education. It follows that the most stable situation is in the Czech Republic, and up to 2013 the worst situation in employment was in Hungary, where the decrease was by 8.18 p.p. in 2010. In 2015, however, Hungary faced the largest increase in employment of all V4 countries, by 12.34 p.p. Although higher employment rates were recorded in Slovakia than in the Czech Republic (2008: 5.5 p.p. and in 2011, 2012 and 2014), but there were also bigger decreases, especially in 2010 and 2013.

Graph 3.25: Development of employment base index in Upper secondary and post-secondary non-tertiary education in %



Source: authors' own elaboration

Unemployment rates indicate the relationship between the population as a product of the education system and the national labour market demands. Enhancing the quality of higher education makes the employability in the labour market more demanding. V4 countries are currently struggling with a lack of qualified labour, but in the recent past, economies had to reduce high unemployment rates and tackle the unemployment-related economic and social problems.

3.4 Recommendations and instruments to support inclusive growth in the regions of V4 countries

Even though significant progress has been made in a number of areas, efforts must always be made to ensure long-term and stable economic growth in a sustainable manner. Recently, the regions of Visegrad countries have identified the areas that need to be paid attention. Based on the identification of problems, the European Commission has put forward recommendations to improve economic performance in following areas:

- Educational attainment - despite the high share of population with tertiary education, these regions have a relatively high share of the population with low level of education, or of early school leavers from compulsory education;
- Sustainability of public finances and ensuring efficient public administration with quality services for citizens;
- The labour market due to a relatively high unemployment rates in comparison to those of Western European countries;
- Energy related to the high share of industry in V4 countries and focus on improving energy efficiency through the use of sustainable and eco-friendly technologies (European Union, 2018).

The European Structural Funds and the EU Operational Programs are also used to meet the objectives and recommendations of the European Commission. Funding sources for the current programming period include:

- European Regional Development Fund,
- European Social Fund,
- Cohesion fund,
- European Agricultural Fund for Rural Development,
- European Maritime and Fisheries Fund.

Within the 2014-2020 programming period, it will be possible to work on a number of operational programs that individual countries have developed and adapted to the development of their individual development strategies.

Figure 3.1 shows the structure of the operational programs of V4 countries in the programming period 2014-2020. It follows that operational programs share several features. Operational programs of V4 countries share following areas: Environment, Public Administration, Rural Development, Technical Assistance, Infrastructure, Fisheries and Human Resources Development.

Figure 3.1: Operational programs 2014 – 2020

<p style="text-align: center;">CZECH REPUBLIC</p> <ul style="list-style-type: none"> • OP Business and Innovations for Competitiveness, • OP Transportation, • OP Praha – pole of growth in CR, • Rural Development Program, • OP Research, Development and Education, • OP Environment, • OP Technical Assistance, • European Territorial Cooperation Programs, • OP Employment, • Integrated Regional Operational Program, • Operational Program Fisheries. 	<p style="text-align: center;">SLOVAK REPUBLIC</p> <ul style="list-style-type: none"> • OP Research and Development, • OP Integrated Infrastructure, • OP Human Resources, • OP Quality of the Environment, • Integrated Regional OP, • OP Effective Public Administration, • OP Technical Assistance, • OP Fisheries, • OP Rural Development Program, • Programs of cross-border, national, international cooperation,, • OP Food and Material Aid.
<p style="text-align: center;">POLAND</p> <ul style="list-style-type: none"> • OP Infrastructure and the Environment, • OP Human Capital, • OP Intelligent Development Program, • OP Knowledge and Development, • OP Digital Poland, • OP Eastern Poland, • OP Technical Assistance, • Rural Development Program, • OP Territorial Cooperation, • Fisheries program. 	<p style="text-align: center;">HUNGARY</p> <ul style="list-style-type: none"> • OP Economic Development and Innovation, • OP Territorial Development, • OP Competitiveness of Central Hungary, • OP Human Resources Development, • OP Environment and Energy Efficiency, • Integrated Transport Operational Program, • OP Public administration and Development of Public Services, • OP Support for people in need, • Rural Development Program, • Hungarian Operational Program for Fisheries.

Source: authors' own elaboration by European Union, 2018

Having evaluated the trends of selected inclusive growth indicators, it can be concluded that V4 countries are striving to continuously improve and create conditions for inclusive growth, which also brings positive outcomes in eliminating negative factors causing problems in the economy. When pursuing this trend, V4 countries could draw closer to the living standards of Western European countries.

4 ANALYSIS OF THE DEVELOPMENT OF SELECTED FACTORS INFLUENCING SMART, SUSTAINABLE AND INCLUSIVE GROWTH

In order to increase productivity and social equity in all Member States, the EU has adopted objectives in five areas, such as employment, science and research, climate change and energy, education and poverty reduction. The Europe 2020 strategy, thanks to its nature and content, is a unique document for the development of European integration in areas that were disturbed by the global economic crisis. Europe 2020 is a medium-term strategy with a decade-long perspective and specific objectives in several areas of its scope. The main purpose of this chapter is to analyse the selected factors that condition intelligent, sustainable and inclusive growth in the NUTS 2 regions of the V4 countries.

The Europe 2020 strategy is designed to create the conditions for smart, sustainable and inclusive growth. The strategy set five priorities to be achieved by the end of 2020. These targets include employment, R & D, climate / energy, education, social inclusion and poverty reduction. Achieving these goals should be consistent with reducing regional disparities across the different European regions and contributing to sustainable economic growth.

4.1 Smart, sustainable and inclusive growth under labour market conditions

The European Community is made up of countries that differ economically from each other (Bednárová, 2017), thus it is difficult to coordinate the policy on balancing disparities. Regional differences in the V4 labour markets can also be observed.

Smart growth refers to enhancing EU performance in the following areas:

- Education or ways to motivate people to learn and adapt their skills to current labour market demands;
- Research and innovation or ways of developing new products and services that will generate growth and new jobs to help address social issues;
- Digital society - associated with the use of information and communication technologies (Páleník et al., 2015).

One of other EU priorities under the Europe 2020 strategy is sustainable growth, the concept of which seeks to create conditions that will contribute to economic growth in the long run. In other words, it is a way of developing society that ensures a balance between economic and social progress in full respect of the environment (Hudrlíková, 2013).

Inclusive growth is defined as a means of achieving sustained, stable and sustainable growth. A common definition, however, says that economic growth is inclusive when the majority of the country's population is involved in its production and results. The International Labour Organization defines inclusive growth as a growth ensuring that the benefits of development reach the entire population, including the most vulnerable ones (Hudrlíková, 2013).

All V4 countries had long been seeking to join the European Union. Their membership in the EU was seen as a significant step forward in the process of overcoming barriers through mutual cooperation. V4 countries became members of the EU in 2004. The V4 group was not only an alternative to the efforts for Pan-European integration. Their activities are in no way directed to be kept by themselves or to weaken the relations with other member countries. On the contrary, the aim of this group is to encourage cooperation with all countries, especially with their neighbours (Abrahám, Vošta, 2011).

In order to meet the purpose of this chapter, it was necessary to select a set of indicators that provide for smart, sustainable and inclusive growth. Thus, trends in employment, at-risk-of-poverty and social exclusion rates, education and training, spending on science and

research, household Internet access, and waste production were examined and evaluated.

Labour market and human resources

Recent trends in the V4 labour markets reflect political and socio-economic trends. V4 countries are alike in terms of territorial conditions and socio-economic structures. They joined together in order to increase competitiveness and to be placed on equal footing in Europe. However, the performance of V4 economies is much lower than that of Western Europe. Weaker V4 labour markets are also reflected in wage policy. Emigration to Western European countries for "better" working conditions and "higher" pay brought about the lack of qualified labour, aging working population, which increase the economic burden on families.

The emigration of highly trained and qualified people creates gaps in the labour market, resulting in increased regional disparities and threats to regional competitiveness. In the light of continuing economic development of V4 countries, the EU policies aim to alleviate regional differences in the labour market, strengthen its integrity by exerting pressure on providing equal working conditions for domestic and foreign workers. Supporting mechanisms to meet these objectives include start-up investments, soft services, ICT sector, science and research, as well as support for education, retraining or labour mobility. As V4 countries are among the most advanced countries in the EU, it is questionable whether these measures will improve the conditions for retaining qualified workers in the regions and avoid negative demographic trends or whether mobility will be encouraged which will make the disparities grow.

The labour market refers to the supply and demand for labour in which employers provide the demand and employees the supply (Tuleja, 2007). The labour market gathers human resources as the most important asset of the market economy (Uramová, 2004).

Labour markets are shaped mainly by demographic trends. The reduction of the share of economically active population in the V4 countries is given by the following trends:

- the aging of the population with a strong probability of retirement age extension and lower employee productivity,
- increasing the student enrolments in higher education,
- work abroad (Baránik, 2002).

Human resources are a source of effective activity and prosperity. For this reason, they are an essential foundation on which strengths and competitive advantages are built not only in enterprise but also in regions (Vetráková, 2001).

Human resources have a major impact on the production capability of countries. In addition, they also determine their position in the world in terms of economic development. Therefore, human resources are vital for labour markets. In the competitive environment of today, economic success and competitiveness rely not only on material, financial or information resources, but primarily on human resources, which are a key to success and prosperity. Material, financial or information resources are considered to be the resources that need to be managed in order to function properly (Bakoš, 2006).

4.2 Economic performance of the V4 regions

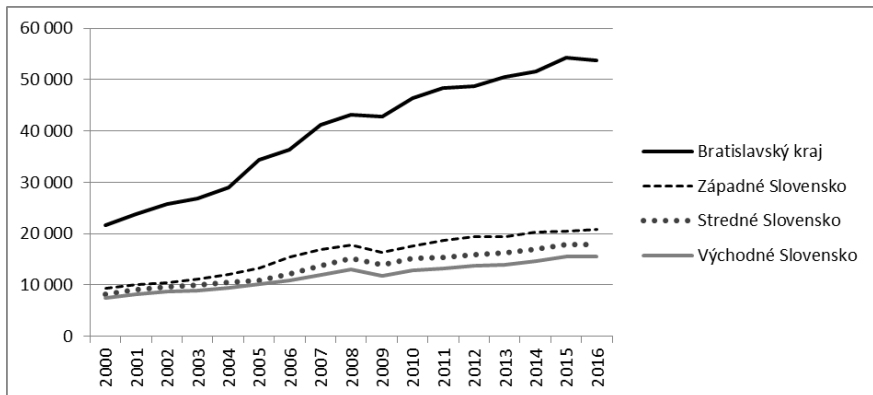
Gross domestic product (GDP) is considered as the basic macroeconomic indicator, which reflects the economic performance and the strength of the national economy as a whole and also its regions. According to Eurostat (2018), gross domestic product at market prices is the final result of the production activity of resident producer units. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation.

We examine gross domestic product per capita in the regions of V4 in current market prices in PPS. Regional GDP per inhabitant is a share of

two indicators - regional GDP (which used the composition criteria according to the place of work) and average amount of populations with permanent residence in existing territory (based on the resident principle). This indicator used to be overestimated especially in regions with high job attendance (regions of the capital cities). On-going discussions in Eurostat are appointed to improve applicability of the indicator, especially by replacing the indicator of permanent residence in existing territory. (Statistical Office of the Slovak Republic, 2014)

We probe the development of GDP per inhabitant in the period 2000-2016. More recent data are not available because NSIS have 24 months after the end of the reference year for the transmission of basic data to Eurostat. Graph 4.1 shows the trends in GDP per capita in current market prices in PPS in the Slovak regions.

Graph 4.1: Trends in GDP per capita in the Slovak regions (PPS)



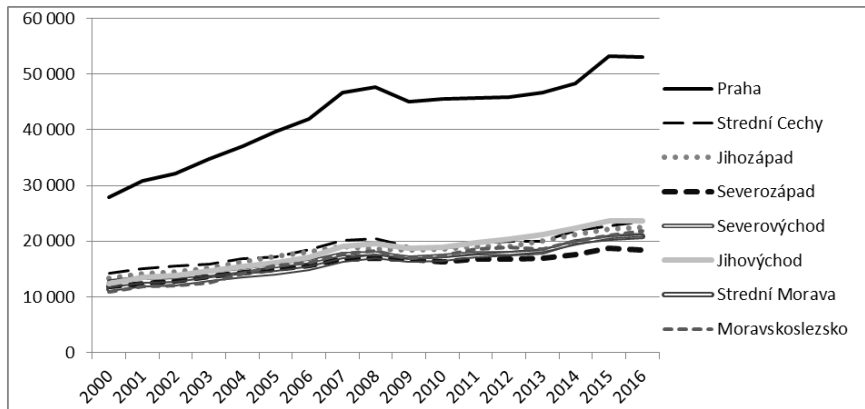
Source: authors' own elaboration based on Eurostat data

The development of GDP growth per capita in the Slovak regions was satisfactory, with an upward growth, with the exception of the recession year of 2009. Bratislava region reached the highest level of GDP per inhabitant in the whole observed period in Slovak Republic (54 200 in 2015). According to Havierniková and Janský (2014, p. 137), in Bratislava region there is the highest concentration of production with high added value and it is characterized by high mobility of the workforce that comes

from another region and other related agglomeration factors. Bratislava region is located close to the other significant prosperous cities, such as Vienna or Győr. Difference in results is extremely large between Bratislava region and other regions of the SR. The weakest region is Východné Slovensko which reaches only about 30% of the level of GDP per inhabitant of Bratislava region (15600 in 2016).

Graph 4.2 shows the trends in GDP per capita in current market prices in PPS in the Czech regions.

Graph 4.2: Trends in GDP per capita in the Czech regions (PPS)

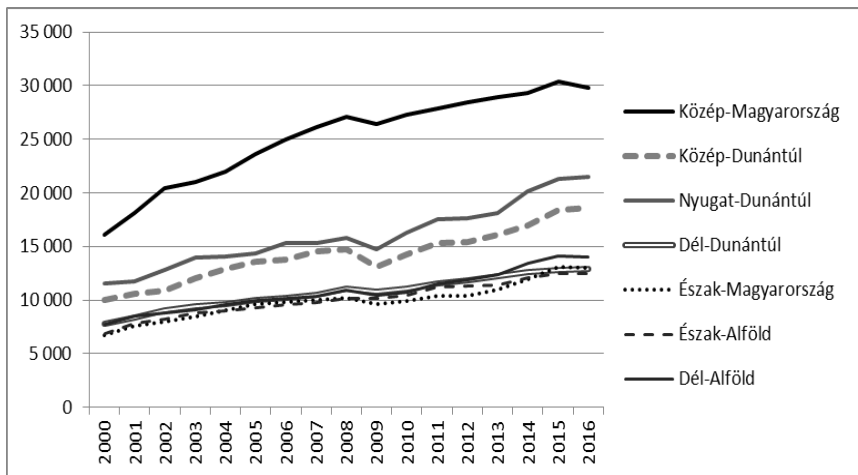


Source: authors' own elaboration based on Eurostat data

GDP per capita in the Czech regions was growing during the period under analysis, with the exception of 2009, with the exception of the recession year of 2009. In the Czech Republic, the region of Praha is the most productive region. GDP per capita increased from 27,900 in 2000 to 53,100 in 2016. The region of Moravskoslezsko reached the lowest level of GDP per inhabitant in 2000-2003, the region of Střední Morava in 2004-2007 and 2009, the region of Severozápad in 2008, 2010-2016. The weakest region reached in average 37% of the GDP per inhabitant of the Praha region.

Graph 4.3 shows the trends in GDP per capita in current market prices in PPS in the Hungarian regions

Graph 4.3: Trends in GDP per capita in the Hungarian regions (PPS)



Source: authors' own elaboration based on Eurostat data

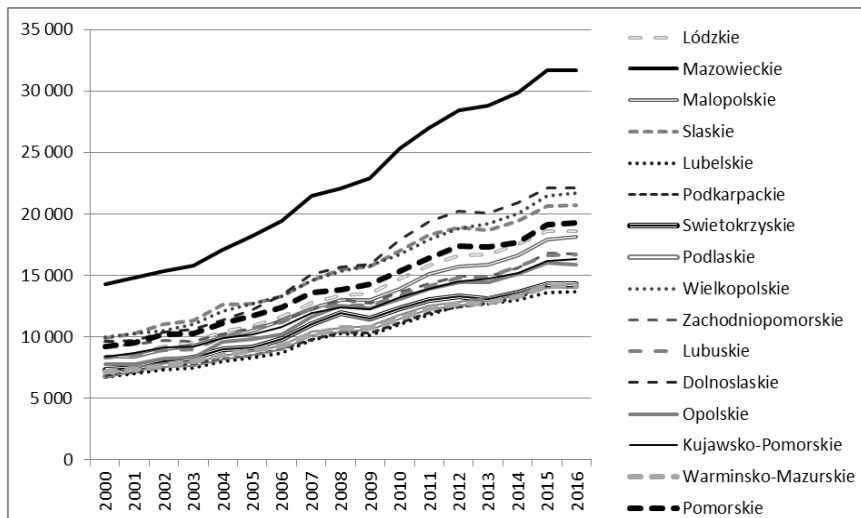
Similarly, GDP per capita was rising in the regions of Hungary, with the exception of the 2009. In Hungary, the highest GDP per capita was in the region of Közép-Magyarország. The weakest regions were Észak-Magyarország (2000-2004, 2008-2014) and Észak-Alföld (2004-2008, 2015-2016) which achieved 39 % of the Közép-Magyarország GDP on average.

Graph 4.4 shows the trends in GDP per capita in current market prices in PPS in the Polish regions.

In Poland, GDP per capita developed similarly to the other V4 countries, but Poland was not hit as hard by the crisis. Therefore, GDP per capita in PPS slowed down instead of going down sharply. In Poland, the highest GDP per capita was recorded in the region of Mazowieckie region (31700 in 2016); the lowest GDP per capita were recorded in the regions of Podkarpackie and Lubelskie. In the early years of the analysed

period, the weakest regions reached more than 45 % of the best region's GDP; the proportion is about 42 % in the subsequent years.

Graph 4.4: Trends in GDP per capita in the Polish regions (PPS)

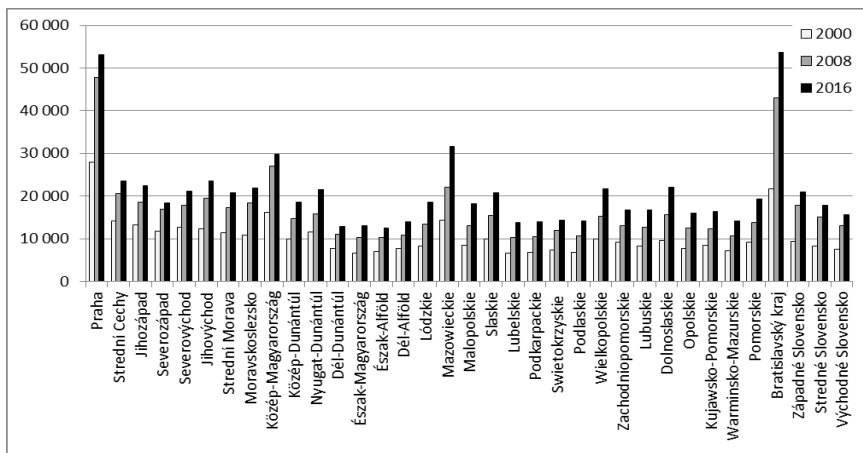


Source: authors' own elaboration based on Eurostat data

Graph 4.5 shows a comparison of the GDP per capita in V4 countries at NUTS2 level in 2000, 2008 and 2016.

It follows that the highest levels of GDP per capita are in the regions Praha and Bratislava. Far behind were the Polish region of Mazowieckie and the Hungarian region of Közép-Magyarország. The lowest economic performance was recorded in Polish and Hungarian regions. The highest GDP growth per capita was in the regions of Bratislava and Praha.

Graph 4.5: Comparison of the GDP per capita in V4 countries (PPS)



Source: authors' own elaboration based on Eurostat data

4.3 Differences in employment rates in the V4 regions

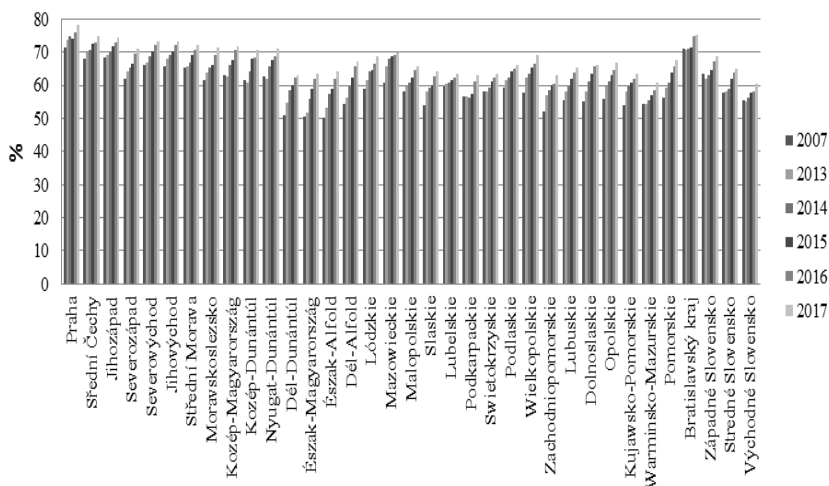
Employment is an important indicator of the economy's health. Employment can be defined as the engagement of working population in the process of creating new products and services. Employment is monitored for the importance of human factor and its impact on the development of economies. Employment is also one of the most important indicators of the performance of economies and regions.

Employment covers persons aged 15 years and over (16 and over in Spain, Italy and the United Kingdom, 15-74 years in Estonia, Latvia, Hungary, Finland, Sweden, Norway and Denmark, and 16-74 years in Iceland), living in private households, who during the reference week performed work, even for just one hour, for pay, profit or family gain, or were not at work but had a job or business from which they were temporarily absent, for example because of illness, holidays, industrial dispute or education and training. (Eurostat, 2018)

Employment has a direct impact on national and regional economic and social developments. Employment is analysed through the employment rate indicator, which is the share of the number of working people aged 15-64 on the total population aged 15-64, expressed as a percentage.

Graph 4.6 shows the employment rates in V4 countries at NUTS 2 level.

Graph 4.6: Employment rates in V4 countries (%)



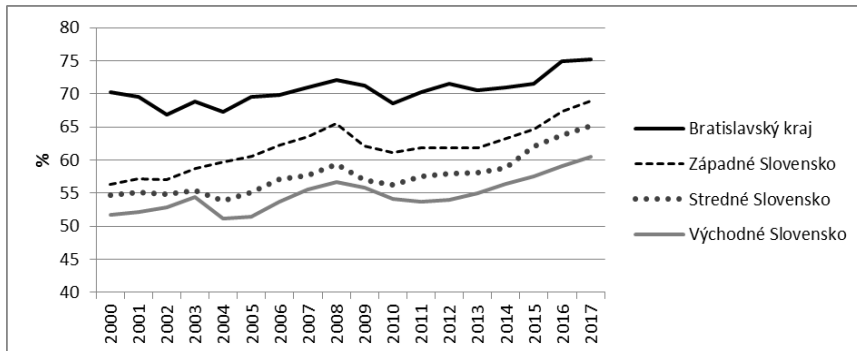
Source: Eurostat, 2018

From the regional point of view, the highest employment rates were in the regions of Praha and Bratislava. Relatively high employment rates were recorded in the Polish region of Mazowieckie and the Hungarian regions of Közép-Magyarország and Nyugat-Dunántúl. Much lower employment rates were found in the remaining Hungarian and Polish regions. Generally speaking, trends in employment rates were positive, unemployment rates went down and new jobs were created.

The text below discusses the employment trends in V4 countries at NUTS2 level. Trends in employment will be illustrated for each V4 country

separately: Slovak Republic (Graph 4.7), Czech Republic (Graph 4.8), Hungary (Graph 4.9) and Poland (Graph 4.10).

Graph 4.7: Employment rates in the regions of the Slovak Republic (%)



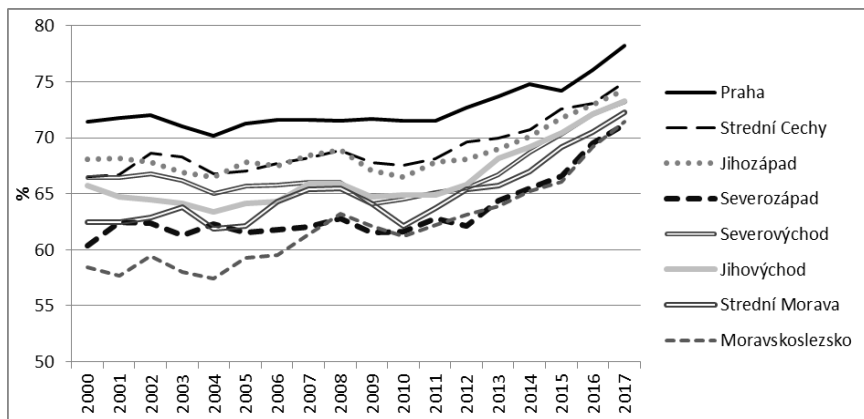
Source: authors' own elaboration based on Eurostat data

In the Slovak Republic, there were significant differences in economic level of individual regions, being closely related to differences on labour market, along with employment. The situation in the Slovak labour market reflected mainly the profound changes in the structure of the national economy due to the transition from centrally planned economy to market economy.

In Slovakia, the employment was growing by 2008, then it declined as a result of the economic recession. The lowest employment rate was recorded in 2010. From then on, the employment rate was increasing. This trend was also observed in the NUTS2 regions. The highest employment rate was in the Bratislava Region, where the employment rate stood at 72.1% in 2008, and even 75.2% in 2017. The lowest employment rate was in the region of Východné Slovensko where it went above 55% only from 2007 to 2009 and after 2013.

Regional differences across the Czech regions could also be traced in employment rates. As shown in graph 4.8, the employment rate varied in the Czech Republic from 2000 to 2017.

Graph 4.8: Employment rates in the regions of the Czech Republic (%)

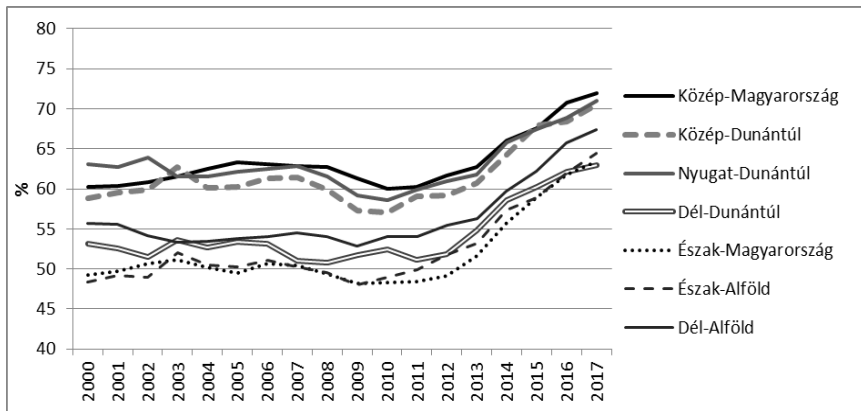


Source: authors' own elaboration based on Eurostat data

In the Czech Republic, likewise in Slovakia, there were significant differences in employment rates in individual regions. Over the period under analysis, employment rates fluctuated, with an upward trend towards the end of the period under analysis. The highest employment rate was in the region of Praha. The employment rate never went below 70%. In 2017, the unemployment rate in the region of Praha stood at 78.2%. The lowest employment rate was recorded in the region of Moravskoslezsko, only 57.4% in 2004. After 2010, the employment rate kept increasing across all the Czech regions while exceeding 70% in all the Czech regions in 2017.

In Hungary, the employment rate fluctuated, with a slight drop after 2008. After 2012, the employment rate increased considerably (Graph 4.9).

Graph 4.9: Employment rates in the regions of Hungary (%)



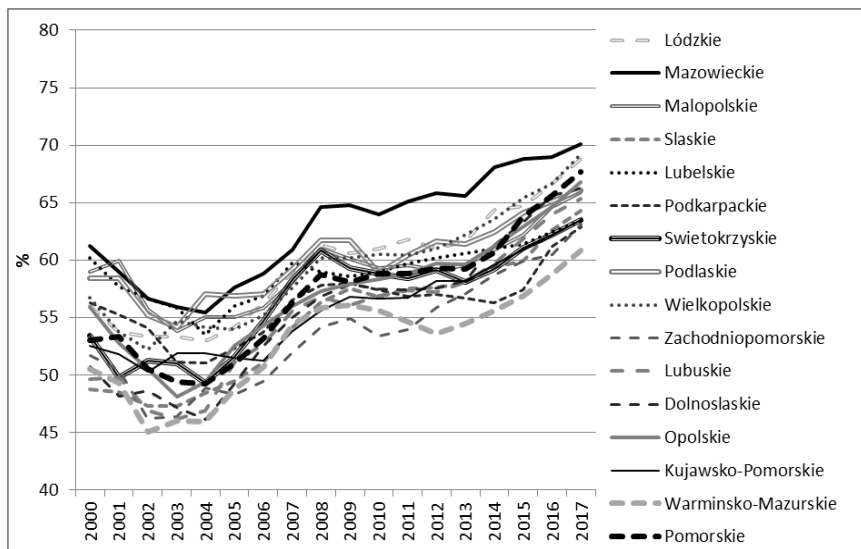
Source: authors' own elaboration based on Eurostat data

In Hungary, the employment was notably lower than in the Czech Republic. Concerning NUTS2 regions, the highest employment rates were recorded in the regions of Közép-Magyarország (71.9% in 2017), the regions of Közép-Dunántúl and Nyugat-Dunántúl to 2007 and after 2012 (mostly above 60%). The lowest employment rates were recorded in the regions of Észak-Magyarország, Észak-Alföld and Dél-Dunántúl where the employment increased considerably only after 2012.

Graph 4.10 shows the development of employment rates in the regions of Poland.

In Poland, employment decreased at the beginning of the period under analysis. From 2004, however, the employment rate was rising. The years of 2008 and 2009 were marked by an economic recession, yet its effects on the Polish labour were not so severe, and the employment rate continued to grow at a slower pace. In some Polish regions, employment was rising slowly. In some others, there was a slight decline in employment rates from 2009 to 2012. The highest employment rate (70.1%) was recorded in the region of Mazowieckie in 2017. The lowest employment rates were recorded in the regions of Zachodniopomorskie, Warminsko-Mazurskie and Podkarpackie.

Graph 4.10: Employment rates in the regions of Poland (%)

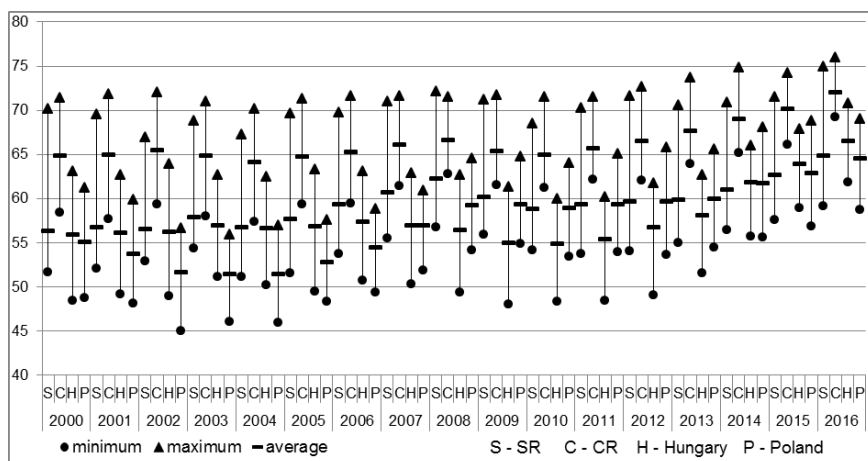


Source: authors' own elaboration based on Eurostat data

The analysis indicated that there were fluctuations in employment rates in the V4 regions with an upward trend towards the end of the period under analysis, and differences in employment rates in the V4 regions. Absolute differences in employment rates (minimum, maximum, average, and variation range) in the regions of V4 countries are shown in Graph 4.11.

Absolute differences in employment rates were quite large in the V4 regions, they were reduced throughout 2014 – 2016. The highest employment rate over the whole period under analysis was recorded in the region of Praha, except for 2008, when the highest employment rate was recorded in the Bratislava region. The lowest employment rate was recorded in Poland in 2000-2006 and 2015-2016, and in Hungary in other years.

Graph 4.11: Absolute differences in V4 employment rates



Source: authors' own calculations and elaboration

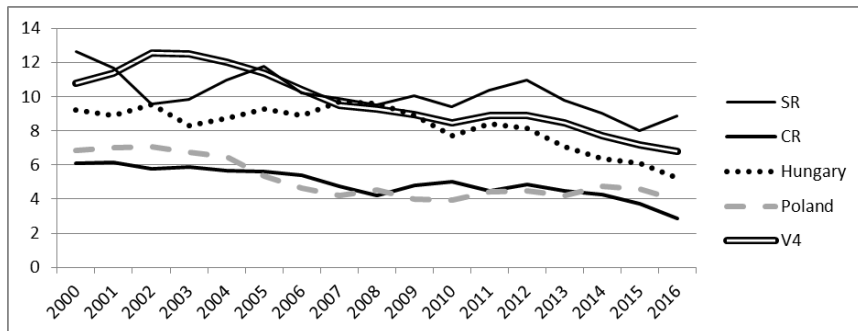
The largest absolute differences in employment rates were in the Slovak Republic (in 2000 and 2005 more than 18 p.p.), except for 2002, when they were the largest in Hungary (14.9 p.p.). The smallest variation range was in Poland until 2007, then in the Czech Republic. Overall, the largest differences in employment rates in the V4 regions were in 2002: a difference of 27 p.p. between the employment rate in the region of Praha (72%) and the region of Warminsko-Mazurskie (45%). In the period under analysis, the variation range in the V4 region was decreasing to reach 17.3 p.p. in 2015 and 2016.

Relative differences in employment levels were monitored through the employment rate variation coefficient. The development of the variation coefficient of the employment rate in V4 countries is shown in Graph 4.12.

The variation coefficient expresses the relative degree of variability. In the period under analysis, the relative differences in employment rates decreased in V4 regions. The biggest differences were recorded in 2002, and the lowest in 2016. The variation in employment rates in the Czech Republic and Poland is notably lower than in Hungary. The largest

regional disparities in employment rates were in the SR, which even increased in 2016.

Graph 4.12: Development of the variation coefficient of the employment rate in V4 countries (%)



Source: authors' own calculations and elaboration based on Eurostat data (2018)

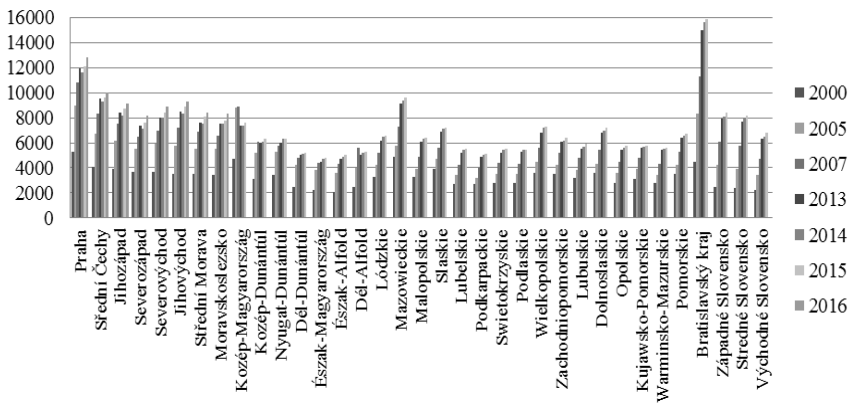
4.4 Household income development in the V4 regions

Household income is another labour market indicator, which is related to inclusive, sustainable and smart growth. Eurostat collects information on NUTS2 income of households in Euro per inhabitant. The Graph 4.13 shows the development of income of households per inhabitant in V4 countries.

The graph shows considerable differences in the household income levels in V4 regions. In general, the highest earnings were in the Czech Republic and Slovak Republic. Regarding the individual regions, the highest per capita income was in the Praha region from 2000 to 2006. From 2006, the highest earnings were found to be in the region of Bratislava, EUR 15,900 in 2015 (EUR 12,100 in the Praha region in 2015). They are followed by the regions of Mazowieckie and Střední Čechy. The Hungarian region of Közép-Magyarország used to be among the highest

income regions in the early years of the period under analysis, which changed after 2007. The lowest income regions include the regions of Východné Slovensko, Podkarpacie from 2003, Észak-Alföld in 2011 and Észak-Magyarország in the years that followed. In 2000, the income of the V4 regions ranged between EUR 2,000-4,300 compared to EUR 4,800-15,900 in 2015.

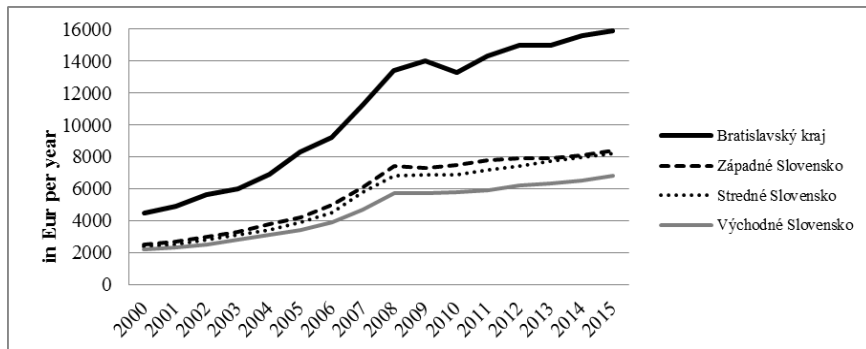
Graph 4.13: Development of household income per inhabitant in V4 countries (Euro per inhabitant)



Source: authors' own elaboration based on Eurostat data

In the text below, the development of household income in the V4 regions in EUR per capita is examined. Graph 4.14 shows the household income development in the Slovak regions, Graph 4.15 shows the household income development in the Czech regions. Graph 4.16 shows the household income development in the Hungarian regions, Graph 5.17 shows the household income development in the Polish regions.

Graph 4.14: Household income development in the Slovak regions (Euro, per year)

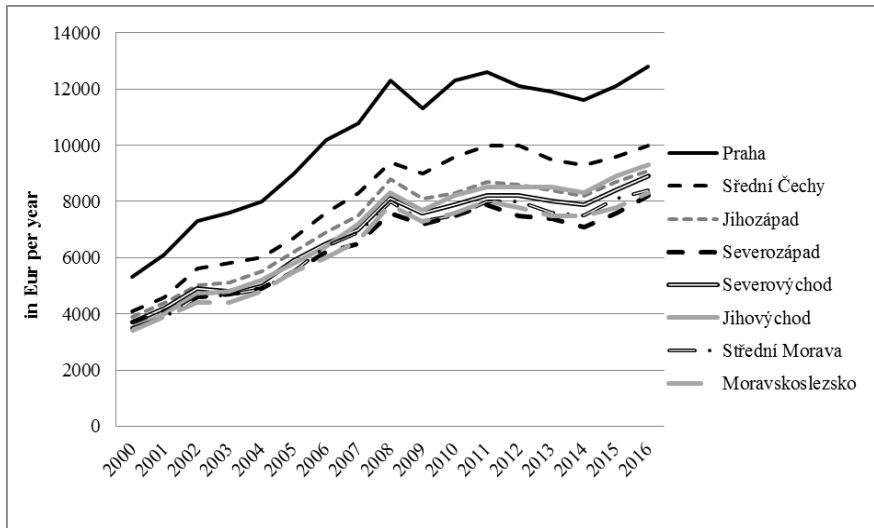


Source: authors' own elaboration based on Eurostat data

The annual household income of the population of the Slovak Republic kept increasing in the period under analysis, except for 2010. There was a big gap found between the Bratislava region and the remaining Slovak regions. In the Bratislava region, household income increased from EUR 4,500 in 2000 to 15,900 in 2015. Differences among the remaining regions were not very large. The lowest household income was in the region of Východné Slovensko, rising from 2,200 in 2000 to 6,800 in 2016.

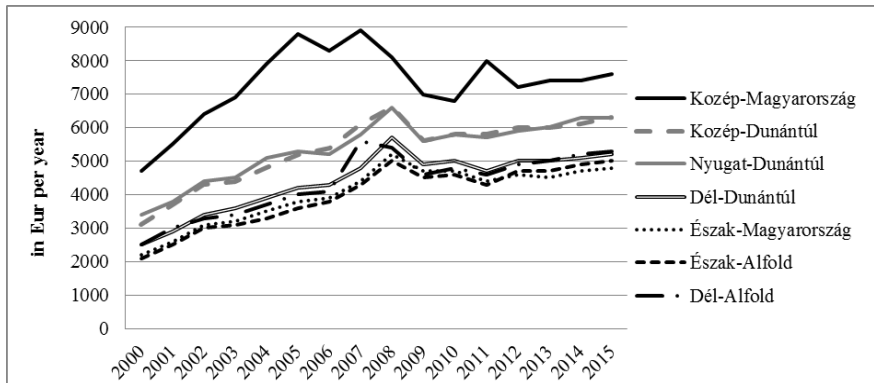
In the Czech Republic, household income was growing in the first half of the period under analysis. From 2009, it was decreasing, increasing and decreasing again from 2012 to 2014. In the Czech Republic, the highest income had the residents in the region of Praha, where the household income increased from EUR 5,300 (2000) to EUR 13,800 in 2016. Far behind was the region of Střední Čechy, followed by other regions. The lowest household incomes were in the regions of Moravskoslezsko and Severozápad.

**Graph 4.15: Household income development in the Czech regions
(Euro, per year)**



Source: authors' own elaboration based on Eurostat data

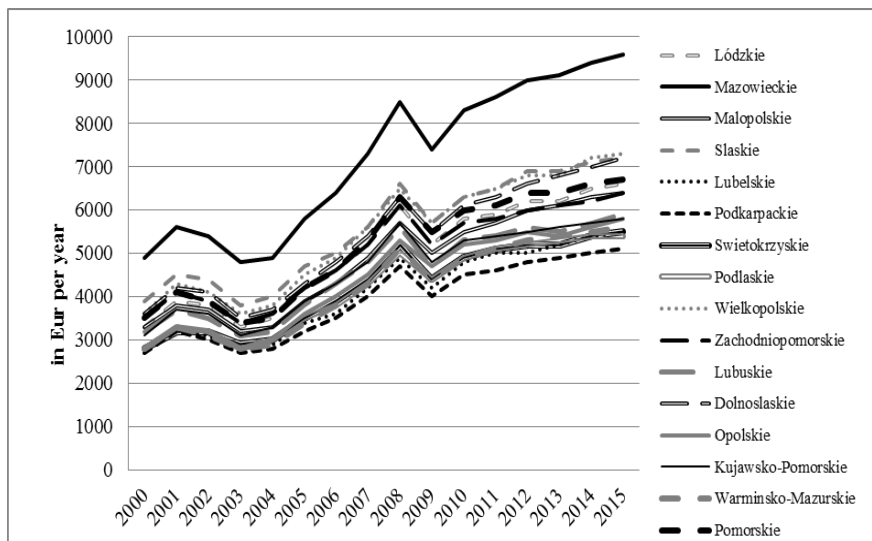
**Graph 4.16: Household income development in the Hungarian regions
(Euro, per year)**



Source: authors' own elaboration based on Eurostat data

In Hungary, the development of household income was similar to that in the Czech Republic: growing in the beginning of the period under analysis, then fluctuating and showing only moderate rate of growth. The highest household incomes were in the region of Közép-Magyarország – EUR 8,900 in 2007. From 2007, household incomes dropped to EUR 7,600. The lowest incomes were in the regions of Észak-Alföld and Észak-Magyarország.

Graph 4.17: Household income development in the Polish regions (Euro, per year)

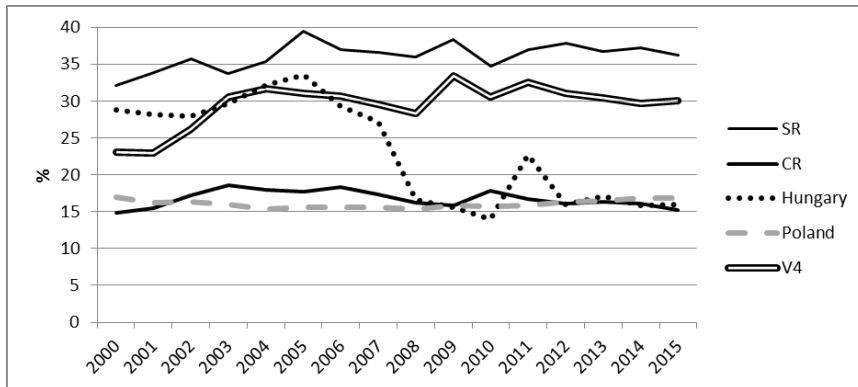


Source: authors' own elaboration based on Eurostat data

In Poland, there was a drop in household incomes after 2001, followed by rapid growth until 2008, a decline in 2009, and a moderate rate of growth in the following years. Similarly, the highest household revenues were in the region of Mazowieckie – EUR 4,900 (2000), and EUR 9,600 in 2015. The lowest household incomes were in the region of Podkarpackie – EUR 5,100 in 2015.

Graph 4.18 shows the development of variation coefficient that is used to measure the relative differences in income levels in V4 countries.

Graph 4.18: Development of income variation coefficient in the V4 regions (%)



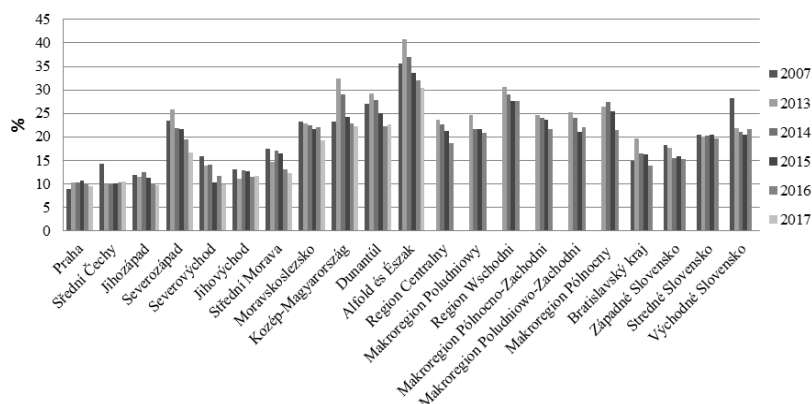
Source: authors' own calculations and elaboration

The biggest disparities in incomes were in the Slovak Republic throughout the entire period under analysis. Slovakia was followed by Hungary for the years from 2000 to 2002 and 2005. In the following years, however, the disparities were alleviated as a result of the income cuts in the region of Közép-Magyarország. The slightest disparities in income levels were in Poland and the Czech Republic.

4.5 Analysis of the social situation development in the V4 regions

The social situation of the population in the V4 regions is assessed using the indicator of people at risk of poverty or social exclusion expressed in %. According to Eurostat (2018), the collection "People at risk of poverty or social exclusion" houses main indicator on risk of poverty or social inclusion included in the Europe 2020 strategy as well as the intersections between sub-populations of all Europe 2020 indicators on poverty and social exclusion. The development of this indicator is shown in Graph 4.19. The data at NUTS2 level are available for the SR and CR, and at NUTS1 level for Poland and Hungary.

Graph 4.19: People at risk of poverty or social exclusion in V4 regions (%)



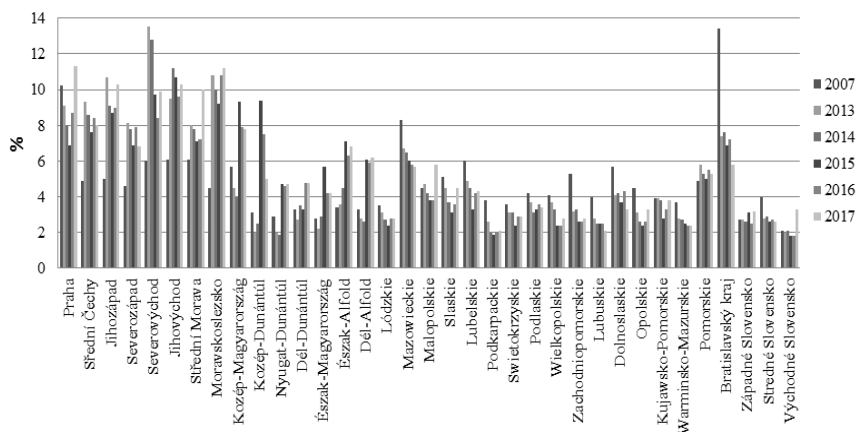
Source: authors' own elaboration based on Eurostat data

The highest percentage of population at risk of poverty and social exclusion was identified in Poland and Hungary whereas the lowest percentage of population at risk of poverty and social exclusion was in Slovakia and the Czech Republic. It has, however, to be noted that the risk is being gradually reduced. From the regional point of view, the most vulnerable regions to poverty and social exclusion were the Hungarian regions of Alföld és Észak and Dunántúl, the region of Wschodni in Poland, and the Východné Slovensko region. The least vulnerable to poverty and social exclusion were the Czech regions of Praha, Střední Čechy and Jihovýchod. A relatively good situation was identified in the region of Bratislava. Compared to the employment rate, however, the reduction in the number of people at risk of poverty is not that significant. In almost all the regions, there was a decline in the share of the population at risk of poverty and social exclusion when the beginning and the end of the period under analysis were compared. Yet, there was a slight stagnation towards the end of the period under analysis, which is not a good new, especially at the times when strategies and operational programs to reduce poverty are developed.

4.6 Participation in education and training in the V4 regions

Education is a must for building knowledge-based economies, and there has been an ever-increasing need for continued lifelong learning. Another indicator under examination was the participation rate in education and training (last 4 weeks) in terms of increasing employability. The development of this indicator is shown in Graph 4.20.

Graph 4.20: Participation rate in education and training in the V4 regions (%)



Source: authors' own elaboration based on Eurostat data

It was found that the citizens of the Czech Republic are those who mostly participate in education and training. The lowest rate in those aged 25-64 was identified in Slovakia. With regard to regions, the Bratislava region ranked among those with the highest participation in education and training along with the regions of the Czech Republic, namely the regions of Severovýchod, Jihovýchod and Moravskoslezsko. A relatively low level of citizens' participation in education and training was, on the other hand, identified in the vast majority of Slovak and Polish regions.

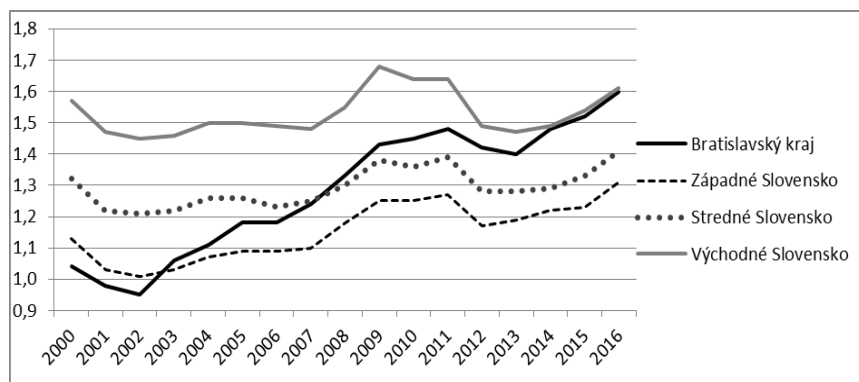
4.7 Development of fertility rates in the V4 regions

Out of health care indicators, the fertility rate, infant mortality rate and life expectancy were selected to conduct an analysis. Their development will be dealt with in the subchapters below.

Fertility rate is the mean number of children that would be born alive to a woman during her lifetime if she were to pass through her childbearing years conforming to the fertility rates by age of a given year. (Eurostat, 2018) Fertility is one of the demographic indicators which is closely related to social and economic developments in individual regions and countries. As noted by Eurostat (2018 Archive: Population Statistics at Regional Level), low fertility will, for example, lead to a decline in the number of students in the education system, lower numbers of working-age people, and a higher number and proportion of older people who will need additional infrastructure, health services and adapted housing. These structural demographic changes may affect governments' ability to collect taxes, achieve financial equilibrium or pay adequate pensions and finance health services.

The development of fertility rates in the Slovak regions is shown in Graph 4.21. The development of fertility rates in the Czech regions is shown in Graph 4.22.

Graph 4.21: Development of fertility rates in the Slovak regions

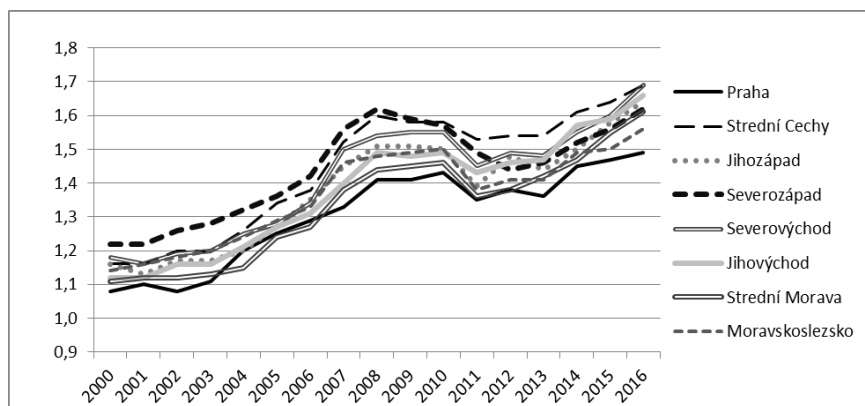


Source: authors' own elaboration based on Eurostat data

The fertility rate in the Slovak Republic was fluctuating. The highest fertility rate was recorded in the region of Východné Slovensko which stood at 1.61 in 2016. In the course of the almost entire period under analysis, the lowest fertility rate was in the region of Západné Slovensko where it rose from 1.13 in 2000 to 1.31 in 2013. It is worth monitoring the development of fertility rate in the region of Bratislava. It was the region with the lowest fertility rate among all the other Slovak regions from 2000 to 2002 (2002: 0.95). It, however, increased dramatically and reached 1.60 in 2016.

Compared to the Slovak regions, differences in fertility rate in the Czech regions were lower. The development of fertility rate was fluctuating, with an upward trend to 2008, then moderately growing and declining, and growing from 2013 - 2016. The highest fertility rate was in 2000-2009 in the region of Severozápad/Northwest (2008: 1.62), in the following years in the region of Střední Čechy (1.69 in 2016, also in the region of Severovýchod in 2016). The lowest fertility rate was recorded in the region of Praha in 2002: 1.08.

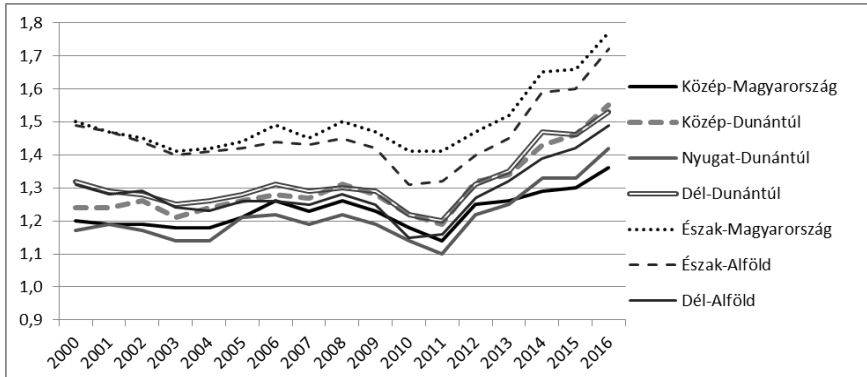
Graph 4.22: Development of fertility rates in the Czech regions



Source: authors' own elaboration based on Eurostat data

The development of fertility rates in the Hungarian regions is shown in Graph 4.23. The development of fertility rates in the Polish regions is shown in Graph 4.24.

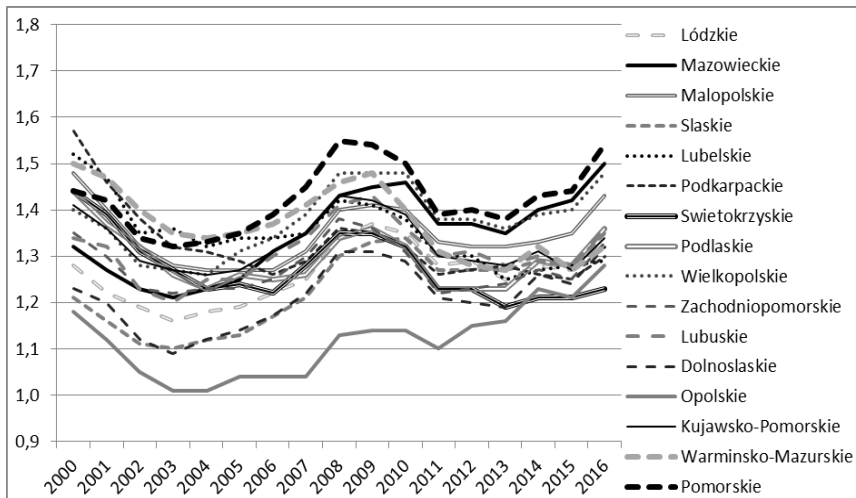
Graph 4.23: Development of fertility rates in the regions of Hungary



Source: authors' own elaboration based on Eurostat data

In the regions of Hungary, fertility rates developed differently from the SR and the Czech Republic. Until 2009, the fertility rate stagnated, followed by a slight decline and a more pronounced growth from 2012 onwards. The highest fertility rate was recorded in the region of Észak-Magyarország (2016: 1.72). The lowest fertility rate was in the regions of Nyugat-Dunántúl (2011: 1.10) and Közép-Magyarország (2016: 1.36).

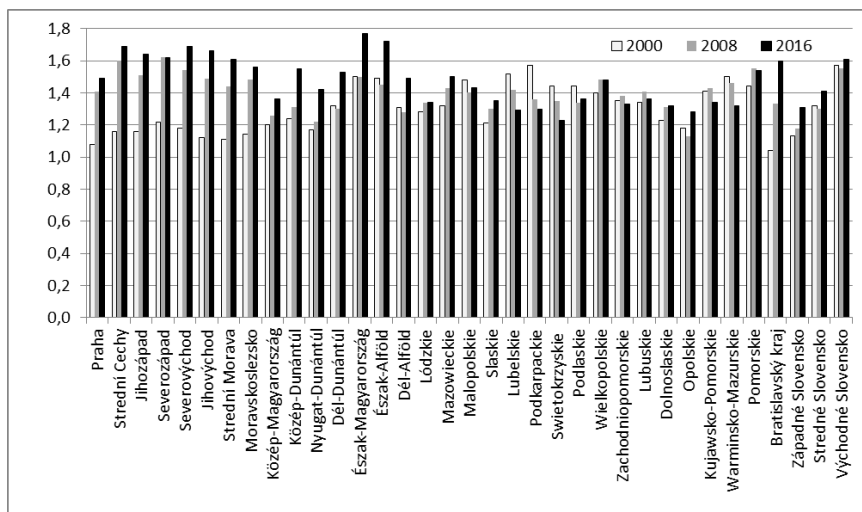
Graph 4.24: Development of fertility rates in the regions of Poland



Source: authors' own elaboration based on Eurostat data

In the regions of Poland, a markedly fluctuating development of the fertility rate could be observed, with a growing trend after 2003 and 2013. The highest fertility rate was recorded in the regions of Podkarpackie in 2000 (1.57) and Pomorskie in 2008 (1.55). The region of Opolskie had the lowest fertility rate in almost the entire period - only 1.01 from 2003 to 2004. The graph below shows the comparison of fertility rates in the V4 regions in three selected years.

Graph 4.25: Comparison of fertility rates in the V4 regions



Source: authors' own elaboration based on Eurostat data

It follows that the highest fertility rates were in 2016 in the regions of Észak-Magyarország and Észak-Alföld (1.77 and 1.72). Some Czech regions and the region of Východné Slovensko exceeded the fertility rate of 1.6. In most V4 regions, the fertility rate increased in 2016 compared to 2000, with the exception of several Polish regions. The lowest fertility rate was in the region of Opolskie. The largest drop in fertility rate was recorded in the region of Podkarpackie, and the largest increase was recorded in the region of Bratislava.

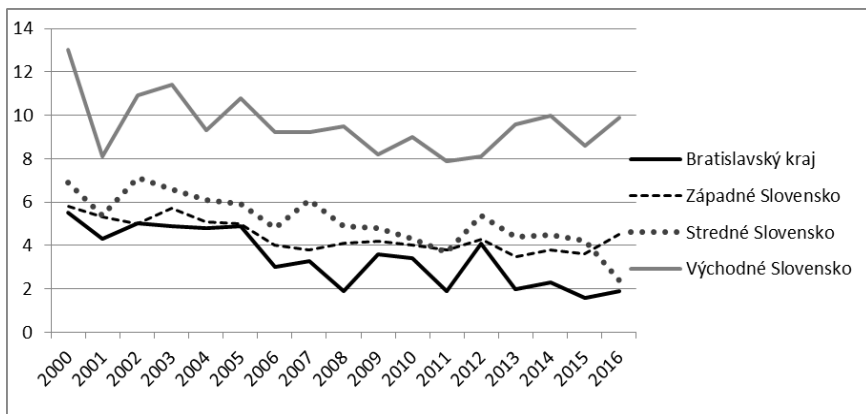
4.8 Development of infant mortality rates in the V4 regions

Infant mortality rate is the ratio of the total number of deaths of children under one year of age during the year to the number of live births in that year. The value is expressed per 1000 live births (Eurostat, 2018). It is an important indicator of mortality rates in terms of social development of populations. Infant mortality rates, apart from the quality of treatment-preventive health care, are also affected by other

factors, such as air pollution, use of contaminated water, lead poisoning and accidents due to accidents.

The development of infant mortality rates in the V4 regions is shown in the following graphs: Slovak Republic (Graph 4.26), Czech Republic (Graph 4.27), Hungary (Graph 4.28), and Poland (Graph 5.29).

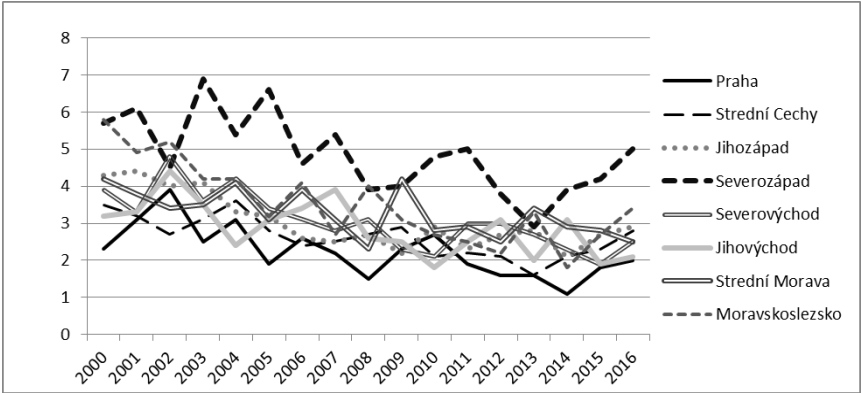
Graph 4.26: Development of infant mortality rates in the Slovak regions



Source: authors' own elaboration based on Eurostat data

In the Slovak Republic, infant mortality rates were fluctuating with a slightly decreasing trend. The highest infant mortality rate was recorded in the region of Východné Slovensko (2000: 13.0) throughout the entire period. The rate is that high mainly due to the high infant mortality rate in the marginalized part of the Roma population living in settlements under poor hygienic and economic conditions. The lowest infant mortality rate was observed in the region of Bratislava (only 1.6 in 2015).

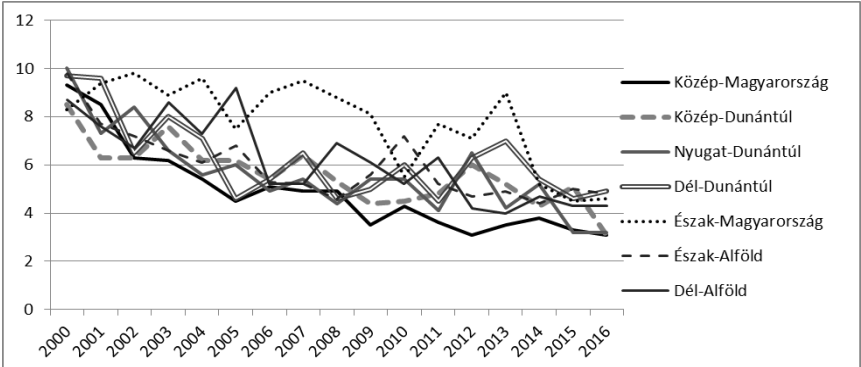
Graph 4.27: Development of infant mortality rates in the Czech regions



Source: authors' own elaboration based on Eurostat data

In the Czech regions, infant mortality rates were fluctuating with a downward trend. The highest infant mortality rates were recorded in the region of Severozápad (as high as 6.9 in 2003). The lowest infant mortality rates were in the region of Praha (2014: 1.1) and the region of Jihovýchod.

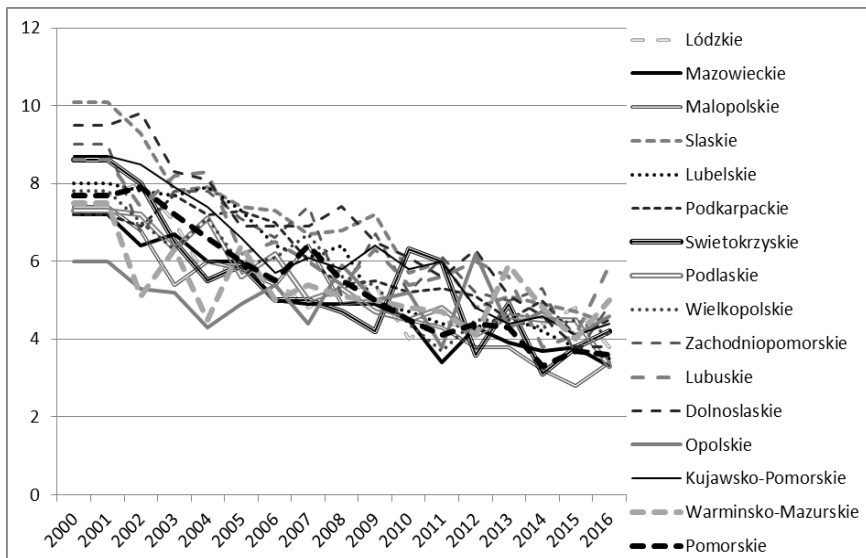
Graph 4.28: Development of infant mortality rates in the Hungarian regions



Source: authors' own elaboration based on Eurostat data

In the regions of Hungary, fluctuating infant mortality rates could be observed with a markedly downward trend. In 2000, infant mortality rates ranged from 8 to 10, in 2016 from 3 to 5. The highest infant mortality rates were recorded in the region of Észak-Magyarország over almost the entire period, although they dropped below 5 in the final years of the period under analysis. The lowest infant mortality rate was recorded in the capital region (2016: 3.1) as well as in the region of Közép-Dunántúl in 2016.

Graph 4.29: Development of infant mortality rates in the regions of Poland

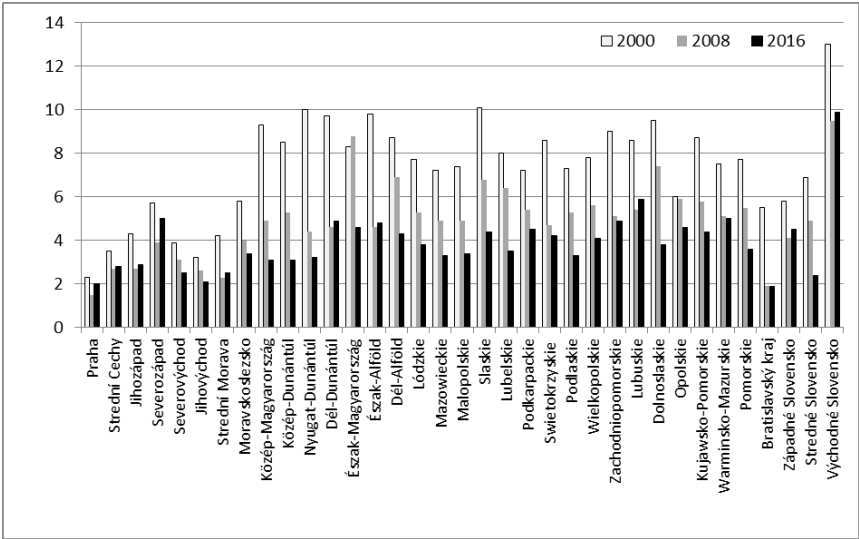


Source: authors' own elaboration based on Eurostat data

In Poland, like in Hungary, infant mortality rates were fluctuating, but there was a markedly downward trend. In 2000, infant mortality rates ranged from 6 to 10.1 and from 2.8 to 4.5 in 2015. The highest infant mortality rates were recorded in the regions of Śląskie and Dolnośląskie. By contrast, the lowest infant mortality rates were in the regions of Opolskie (until 2005), Mazowieckie and Małopolskie. The

Graph below shows the infant mortality rates in the V4 regions in 2000, 2008 and 2016.

Graph 4.30: Comparison of infant mortality rates in the V4 regions



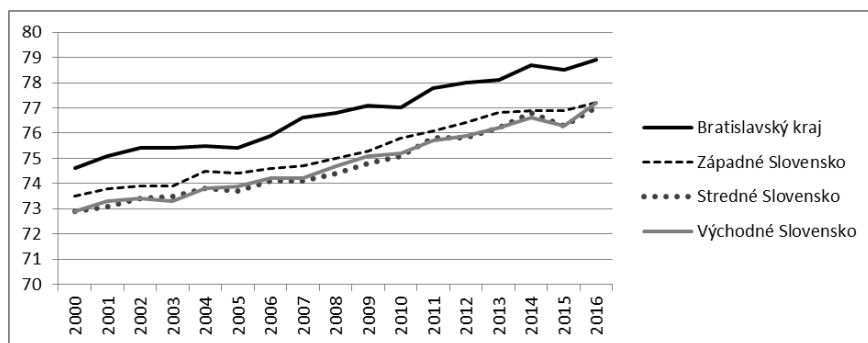
Source: authors' own elaboration based on Eurostat data

The graph shows significant differences in infant mortality rates in the V4 regions. The lowest rates were found to be in the regions of the Czech Republic. In the regions of Hungary and Poland, a pronounced drop in infant mortality rates could be observed in the year 2016 compared to 2000. The highest mortality rates were recorded in the region of Východné Slovensko.

4.9 Development of life expectancy in the V4 regions

Life expectancy at given exact age is the mean number of years still to be lived by a person who has reached a certain exact age, if subjected throughout the rest of his or her life to the current mortality conditions (age-specific probabilities of dying). (Eurostat, 2018) It is a significant indicator of the mortality rate. It characterizes the health of population and the quality of health care system. The development of life expectancy in the Slovak regions is shown in Graph 4.31 and that of the Czech regions is shown in Graph 4.32.

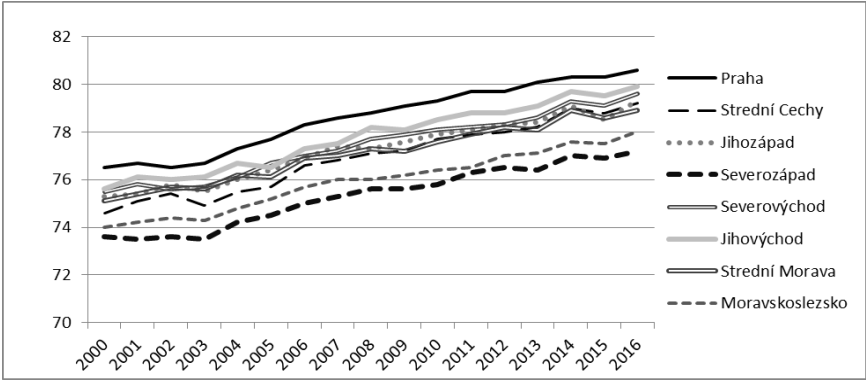
Graph 4.31: Development of life expectancy in the Slovak regions



Source: authors' own elaboration based on Eurostat data

In the Slovak Republic, life expectancy increased in the region of Bratislava from 74.6 (2000) to 78.9 years of age (2016). There was more than a 1-year difference in life expectancy between the region of Bratislava and the remaining Slovak regions. The lowest life expectancy was recorded in the region of Stredné Slovensko, even though life expectancy also increased there from 72.9 (2000) years of age to 77 years of age (2016).

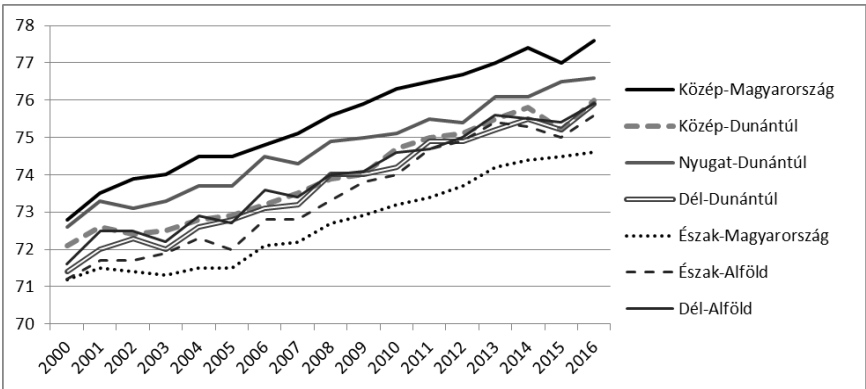
Graph 4.32: Development of life expectancy in the Czech regions



Source: authors' own elaboration based on Eurostat data

Life expectancy increased also in the regions of the Czech Republic. Life expectancy was the highest in the region of Praha - 80.6 years of age in 2016. By contrast, life expectancy was the lowest in the region of Severozápad (below 74 years of age). The graphs below show the development of life expectancy in Hungary (Graph 4.33) and Poland (Graph 4.34).

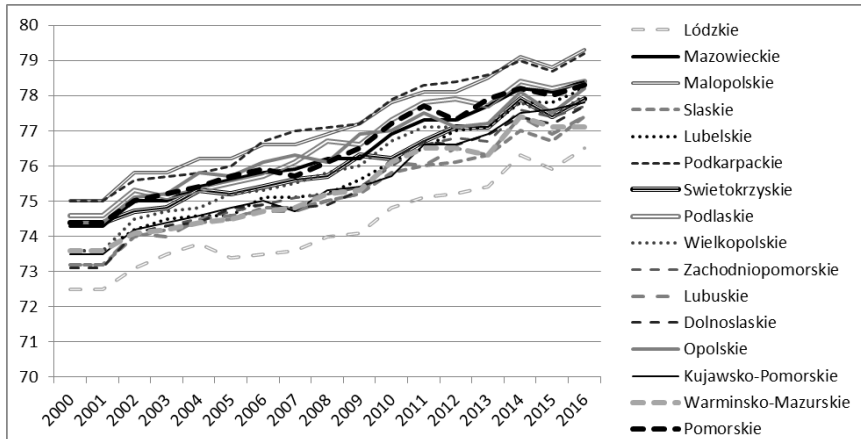
Graph 4.33: Development of life expectancy in the Hungarian regions



Source: authors' own elaboration based on Eurostat data

There was a slightly volatile development of life expectancy with an upward trend in the regions of Hungary. The highest life expectancy was recorded in the region of Közép-Magyarország – an increase from 73.5 years of age in 2000 to 77.6 years of age in 2016. The lowest life expectancy was found in the region of Észak-Magyarország.

Graph 4.34: Development of life expectancy in the Polish regions

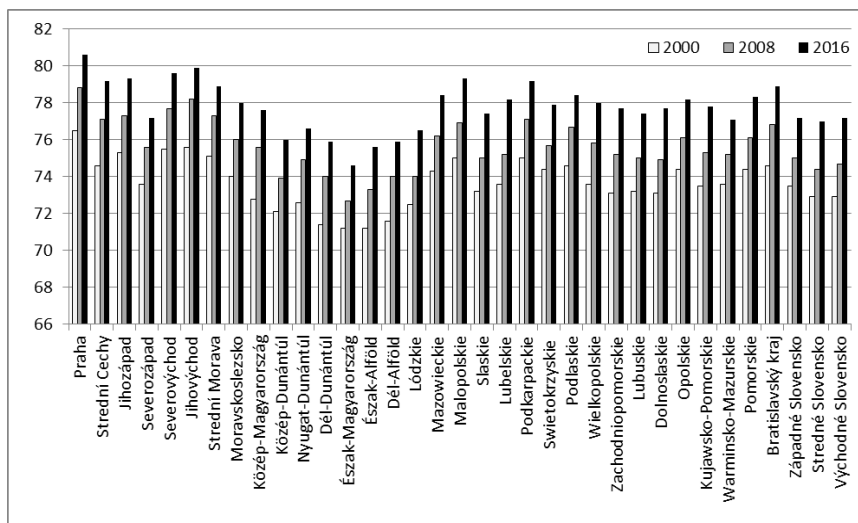


Source: authors' own elaboration based on Eurostat data

Even in Poland, life expectancy was slightly fluctuating, with a pronounced upward trend. In the best regions (Małopolskie, Podkarpackie) life expectancy exceeded the age of 79 in 2016. On the other hand, the region of Łódzkie lagged well behind other regions. Here, life expectancy was 72.5 years in 2000 and 76.5 years in 2016.

Graph 5.35 compares life expectancy in the V4 regions. It follows from the graph that life expectancy increased in all the regions throughout the period under analysis. The biggest increase by 4.8 years was recorded in the region of Közép-Magyarország. Life expectancy was the highest in the region of Praha, the lowest in the region of Észak-Magyarország. The lowest life expectancy was recorded in the Hungarian regions.

Graph 4.35: V4 regions according to life expectancy



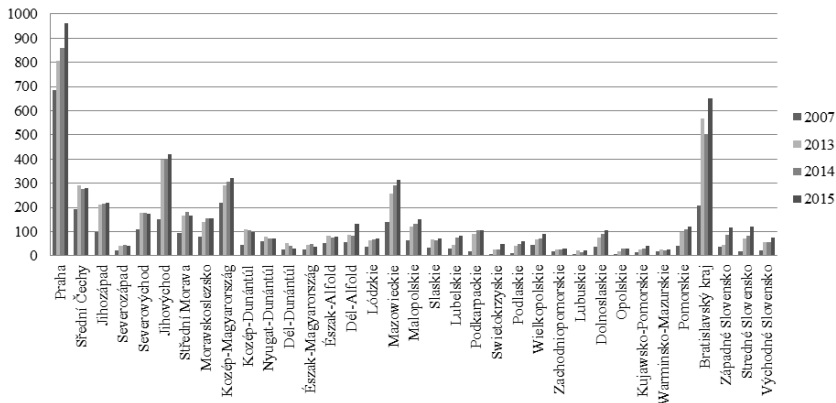
Source: authors' own elaboration based on Eurostat data

4.10 Research and development expenditures in the V4 regions

Research and development are vital for the economic and social development of countries and regions. Research and development ensure competitiveness for businesses, regions and countries. High quality research and development endeavours require sufficient funding.

Research and development (R&D) expenditure is a challenge for V4 countries as most of them are not able to support sufficiently their research and development activities in the long run. Graph 4.36 presents the data on research and development expenditures per capita.

Graph 4.36: Expenditures on R&D per capita (in EUR)



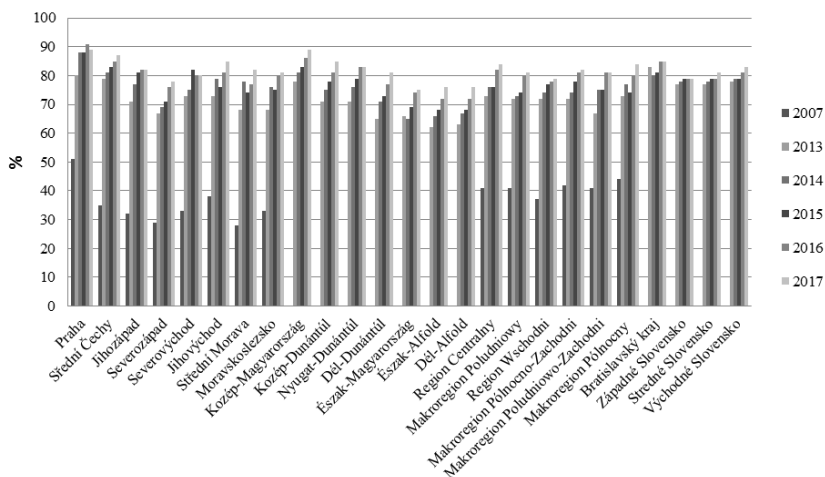
Source: authors' own elaboration based on Eurostat data

The Czech Republic spends the most on research and development. The leading regions were the regions of Praha and Jihovýchod. On the other hand, Poland and Slovakia spent the least on research and development activities. In terms of regions, the highest investments in R&D were in the regions around capital cities which are also centres of R&D.

4.11 Household Internet access in the V4 regions

Rapid innovations and advances in information technology have made the use of ICT a must both at home and work. In order to measure information society, an indicator measuring the percentage of households with Internet access, among other indicators, is used. The development of household Internet access rates in the V4 region is shown in Graph 4.37. Concerning Poland, only NUTS1 data were available.

Graph 4.37: Percentage of household Internet access (%)



Source: authors' own elaboration based on Eurostat data

From 2007 to 2017, there was a significant increase in the number of households connected to the Internet, which may also imply increased digital literacy of the population. Having compared the regions in 2007 and in 2017, the percentage of homes with Internet access almost doubled. With regard to countries, almost identical results were achieved. At the end of the period under analysis, there were more than 80% of households with Internet access in almost all the regions. The regions with the highest percentage were the regions in the vicinity of the capital cities. On the other hand, the regions with the lowest percentage of households connected to the Internet were for instance the regions of Észak-Magyarország, Észak-Alföld and Dél-Alföld.

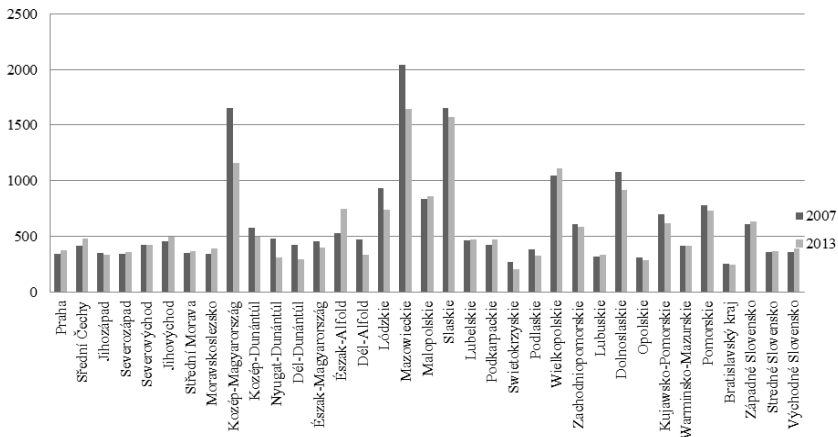
4.12 Waste generation in the V4 regions

The environmental aspect is evaluated through the waste generation index which is one of the basic waste management indicators.

The indicator reflects the amount of waste generated during the period under analysis.

Graph 4.38 illustrates the data on the volume of waste generated in NUTS2 regions.

Graph 4.38: Waste production in thousand tonnes



Source: authors' own elaboration based on Eurostat data

Naturally, waste generated per person was the highest in Poland as it is the most populous country. Concerning individual regions, the lowest amounts of waste were generated in the regions of Świętokrzyskie and Bratislava. The Czech regions also generated low volumes of waste. The largest amounts of waste were generated in industrial regions. The biggest waste generators were the Polish regions of Mazowieckie and Śląskie and the Hungarian region of Közép-Magyarország.

4.13 Assessment of smart, sustainable and inclusive growth in V4

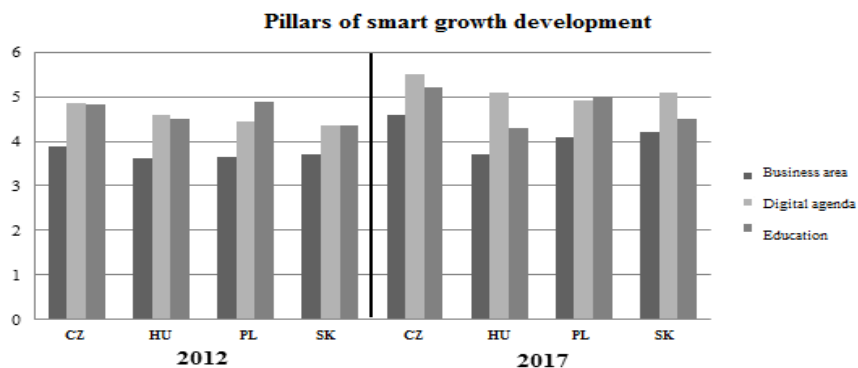
V4 countries are already trying to eliminate the problems caused by the global economic crisis in the second programming period of their

membership in the EU. Another challenge that Member States are facing is the effort to remove barriers in terms of territorial disparities in order to increase the quality of life for the European citizens through the application of support tools. It is, however, questionable whether these efforts are equally effective in all regions and whether European regions are able to reach equality of resources and opportunities. The European Union is striving to achieve positive results in this area, and its efforts are largely reflected in its strategies. Intelligent, sustainable and inclusive growth remains a priority to contribute to the equality of opportunities for all citizens.

Graph 4.39 shows the development of the main pillars of smart growth, such as the point assessment of performance indicators of the business environment and digital agenda, as well as the point assessment of education and training indicators. These indicators were rated by the Institute of the World Economic Forum. The data on V4 countries were used to compare the development and effectiveness of the tools employed. In this case, the years 2012 and 2017 were compared, with 2012 representing the values and results of the 2007-2013 programming period and the year 2017 showing the values and results of the 2014-2020 programming period, in which smart growth has been one of the top priorities.

Following the data comparison, an increase in almost all indicators in the entire V4 community was identified. It is a pleasing fact that according to the World Economic Forum's assessment, the quality and performance of the business environment, digital agenda, education and training, markedly improved over the period under analysis. This was also confirmed by the assessment of selected indicators of employment rate development, participation rate in education and training, or an increased spending on research and development.

Graph 4.39: Pillars of smart growth development

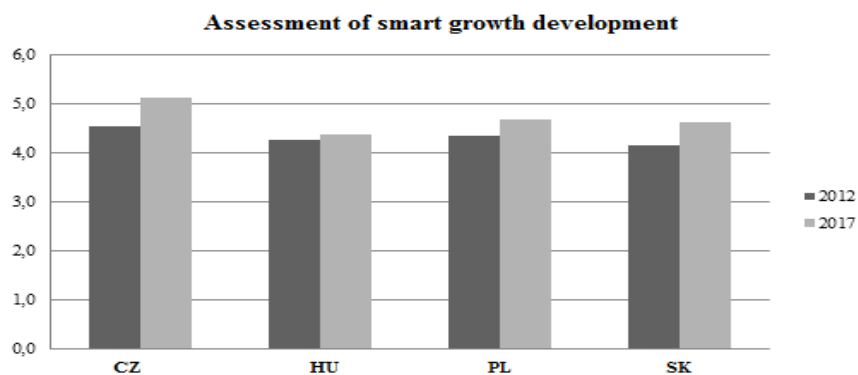


Source: World Economic Forum, 2017

Thus, it follows that the instruments selected as a part of country strategies seem to be effective, which of course does not mean the entire elimination of problems. Even though the countries are successful in improving their results, they still need to go a long way to attain their ultimate goals.

Graph 4.40 builds on the evolution of previous indicators and clearly confirms the positive results achieved by V4 countries.

Graph 4.40: Assessment of smart growth development

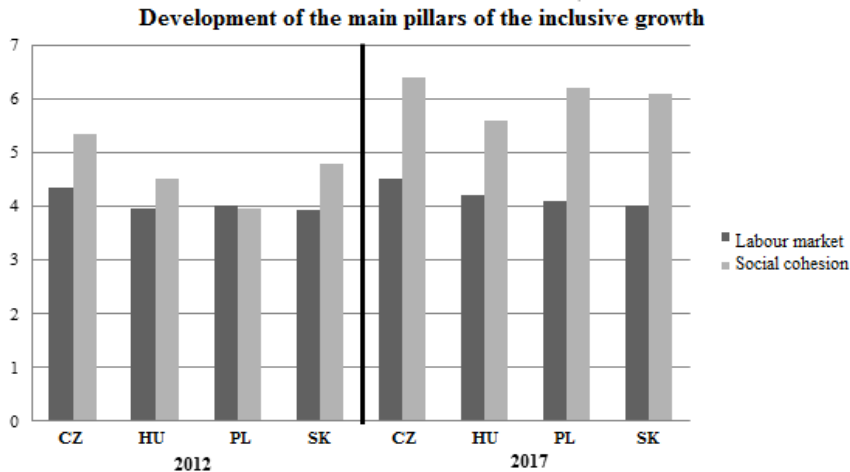


Source: World Economic Forum, 2017

Based on the data from the World Economic Forum, the Czech Republic achieved the best results. Strategies were also well implemented in Poland and the Slovak Republic. The poorest, yet positive results were identified in Hungary.

Graph 5.41 illustrates the development of the main pillars of inclusive growth through point assessment of labour market and employment indicators and of social cohesion indicators. These indicators were also assessed by the World Economic Forum Institute.

Graph 4.41: Development of the main pillars of inclusive growth



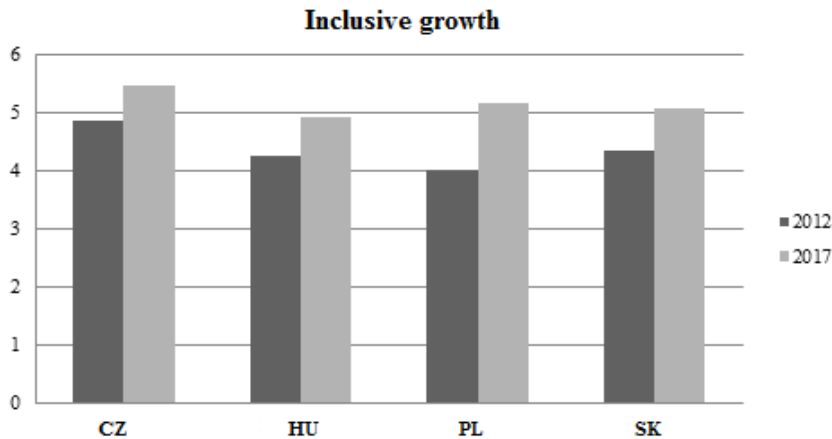
Source: World Economic Forum, 2017

Having compared the years 2012 and 2017, an increase in both indicators was identified, respectively. This trend can again be confirmed on the basis of the assessments of employment rate developments, and developments of population at risk of poverty and social exclusion rates. Labour market and employment –related outcomes were much poorer in comparison with the results obtained in the area of social cohesion. The best results were achieved by the Czech Republic while the poorest results were achieved by Poland and Slovakia. Regarding the development of social cohesion indicators, all countries did well.

Remarkable results were achieved by the Czech Republic, Poland and Slovakia with Hungary lagging well behind.

Graph 4.42 shows the outcomes of inclusive growth development that are derived from the developments in labour market and employment indicators and social cohesion indicators.

Graph 4.42: Inclusive growth



Source: World Economic Forum, 2017

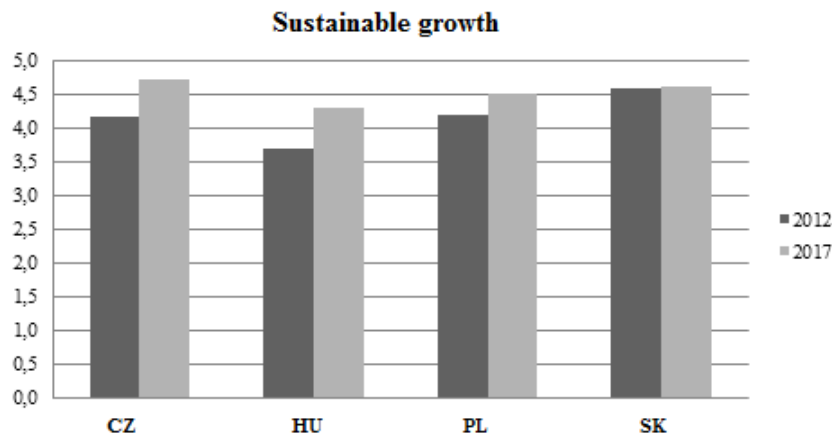
In view of the positive development of these indicators, as shown in the graph above, the positive development of the overall value of inclusive growth can naturally be deduced. The development of inclusive growth remained positive in all V4 countries, which means that the tools for promoting inclusive growth appear to be effective.

Graph 4.43 interprets the outcomes on sustainability development of the results achieved in the different areas of the Europe 2020 Strategy.

Based on information from the World Economic Forum, the Czech Republic was doing best with regard to the sustainability of obtained results. Hungary and Poland were doing very well while Slovakia still needs to address this issue. Although the values of sustainability were

excellent, there were no significant improvements in the period under analysis in Slovakia.

Graph 4.43: Sustainable growth

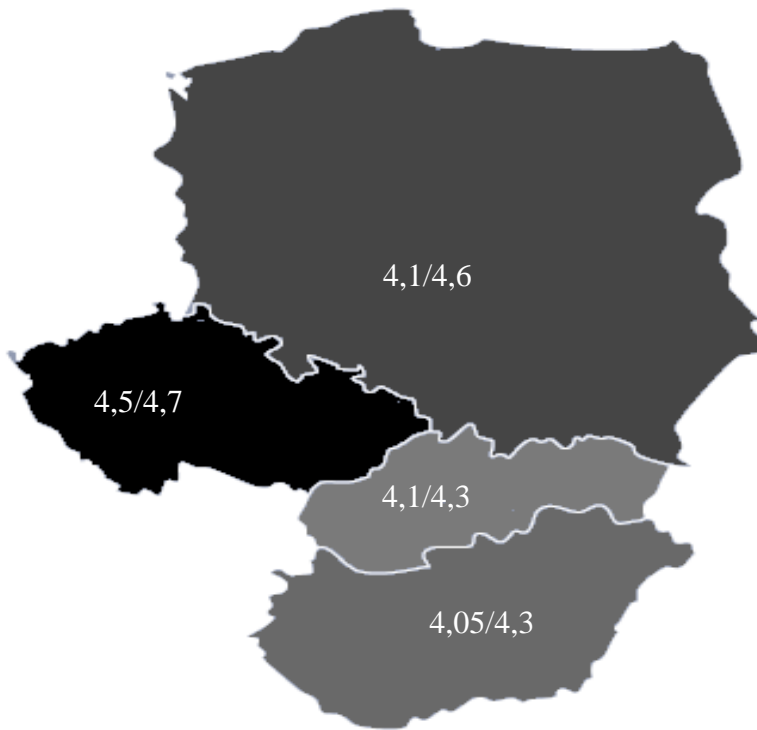


Source: World Economic Forum, 2017

Figure 1 interprets the level of V4 competitiveness as a whole. Over the period under analysis, Poland had the highest degree of competitiveness whereas the lowest one had the Slovak Republic.

With regard to the degree of competitiveness achieved, the best results were achieved by the Czech Republic, which seems to be the most competitive country among V4 countries. The lowest degree of competitiveness was found in the Slovak Republic. Thus, Slovakia has a lot of work to do to catch up with the remaining V4 countries. The lower degree of Slovak competitiveness can be attributed to a relatively high unemployment rate and relatively low adult participation in education and training.

Figure 4.1: Country Competitiveness Index (WEF)



Source: *authors' own elaboration based on World Economic Forum, 2017*

With regard to the degree of competitiveness achieved, the best results were achieved by the Czech Republic, which seems to be the most competitive country among V4 countries. The lowest degree of competitiveness was found in the Slovak Republic. Thus, Slovakia has a lot of work to do to catch up with the remaining V4 countries. The lower degree of Slovak competitiveness can be attributed to a relatively high unemployment rate and relatively low adult participation in education and training.

5 COMPARISON OF NUTS2 REGIONS OF V4 COUNTRIES

Uneven development of regions in the past has caused regional disparities to occur. On the one hand, these differences drive further development and competition of the regions. On the other hand, widening of regional differences is not desirable as it can lead to serious social, economic and political problems and affect negatively the overall development of the state.

That is why the examination and measurement of regional differences is an important starting point for the elaboration of regional development programming documents and formation of regional policy. As noted by Hučka et al. (2008), regional disparity research is highly topical as its findings will contribute to an overall increase in the body of knowledge on regional disparities and improved regional management.

The chapter compares and assesses regional disparities in V4 countries. When measuring regional differences, it is necessary to address two basic issues:

- what indicators shall be used to measure regional disparities,
- what methods shall be used to assess these differences or similarities.

Differences in the V4 regions are compared and analysed through the indicators whose developments were monitored in the previous chapters. Out of those examined, only the indicators with the data available at NUTS2 from 2000 to 2016 were selected. All the selected indicators are expressed in relative numbers so they can be compared across regions regardless of their size and population.

The following labour market, education, health and health care-related **indicators** were chosen:

- employment rate,
- unemployment rate,
- long-term unemployment rate,
- income,

- tertiary education rate,
- fertility rate,
- infant mortality rate,
- life expectancy.

The indicators in the V4 regions were compared in three years: the starting year of 2000, the pre-crisis year of 2008 and 2016 - the last year of the time series under analysis.

The scoring method and cluster analysis were employed to compare the regions. In the scoring method, individual indicators in the V4 regions were assigned points, and the resulting average scores were compared with the economic performance of regions measured by GDP per capita. Cluster analysis was employed to watch the similarities among individual regions using the indicators as used in the scoring method.

5.1 Comparison of the V4 regions using a scoring method

A scoring method is one of the methods of multi-criteria evaluation. When using the scoring method, each parameter is assigned the region, which scored the best value, 100 points, and other regions are assigned indicator points as follows:

- if the maximum value is the best value (employment rate, income, tertiary education, fertility rate, life expectancy):

$$b_{ij} = x_{ij}/x_{j\max} \times 100 \quad (4)$$

- if the minimum value is the best value (unemployment rate, long-term unemployment rate, infant mortality rate):

$$b_{ij} = x_{j\min}/x_{ij} \times 100 \quad (5)$$

where: x_{ij} = the value of j-th variable in the i-th region

$x_{j\max}$ = highest value of the j-th variable

$x_{j\min}$ = lowest value of the j-th variable

b_{ij} = the scores of the i-th region for the j-th variable.

Next, the integral variable d_i , as the arithmetic average of the points for the indicators set for each region is calculated. The best results of observed variable reaches the region in which the integral indicator d_i reaches the maximum value.

Through the number of points obtained, the scoring method shows the relative differences in the indicators examined among countries whereas territorial units are being compared with the best territorial unit in the given indicator. The scoring method can aggregate the indicators measured by different units of measurement into one synthetic characteristic, which represents a dimensionless number. Using the integral indicator thus obtained, it is then possible to determine either the order of individual states, identify differences among countries and determine the lagging sequence.

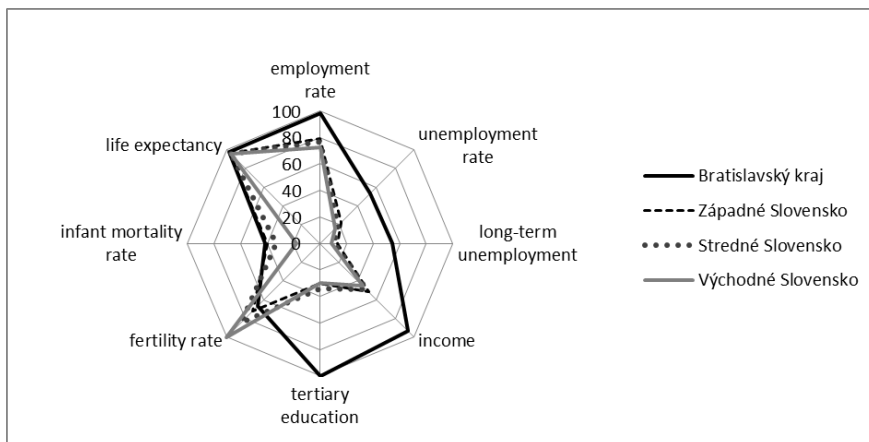
Scoring methods are used for various purposes in technical literature and research papers. Scoring methods to assess regional disparities were employed by Kutscherauer et al. (2010), Tuleja (2010), Svatošová and Novotná (2012), Michálek (2012), Hamada (2014), etc.

Assessment of countries' performance by scoring method provides a comprehensive insight into their performance. However, the results of such an assessment depend on the choice of indicators and countries to be included in the assessment.

5.1.1 Performance assessment of the V4 regions in 2000

2000 is the starting year in the time series. In 2000, V4 countries experienced economic growth (with the exception of the SR). In the Slovak Republic and Poland, there was still high unemployment and high inflation (with the exception of the Czech Republic). The performance assessment of the Slovak regions is shown in Graph 5.1 and that of the Czech regions is shown in Graph 5.2.

Graph 5.1: Point assessment of the Slovak regions in 2000

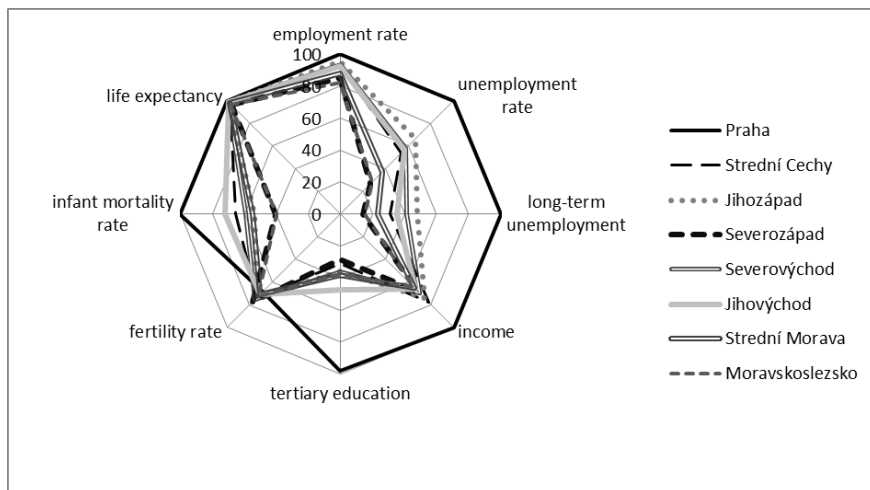


Source: authors' own calculations and elaboration

It follows that the best-performing region was the region of Bratislava, except for the fertility rate indicator. The highest fertility rates were recorded in the region of Východné Slovensko in the Slovak Republic and all V4 countries. The region of Bratislava reached the best value in the tertiary education indicator from within the V4 regions. The region of Bratislava scored over 90 points in the following indicators: employment rate, life expectancy, income.

In the Slovak Republic, the biggest differences were in the share of tertiary education, long-term unemployment rate, income, employment rate. The lowest differences were in life expectancy. In the region of Bratislava, the value of integral variable d_i was 75.69 points, followed by the regions of Západné Slovensko and Stredné Slovensko with a 15-point difference, and the region of Východné Slovensko with two points less than the regions Západné Slovensko and Stredné Slovensko.

Graph 5.2: Point assessment of the Czech regions in 2000



Source: authors' own calculations and elaboration

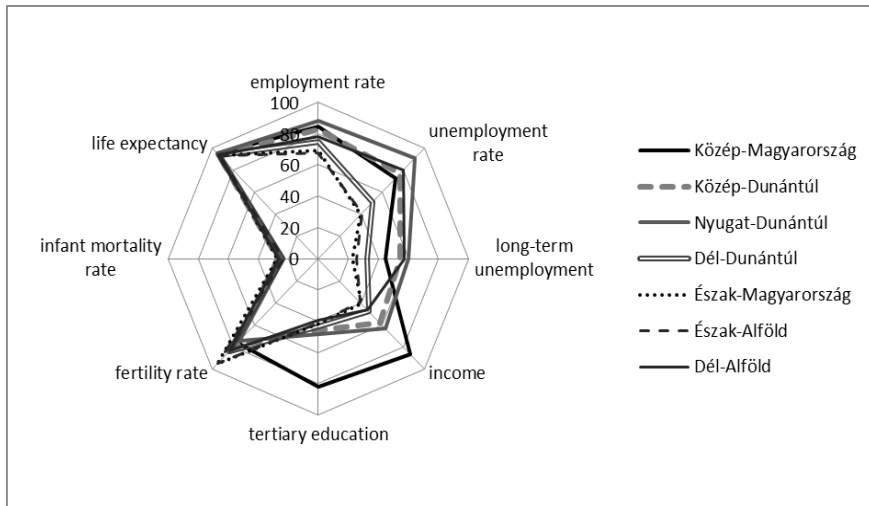
Among the Czech regions, the region of Praha recorded the best values in seven indicators in the Czech Republic and in six indicators within V4 countries. The biggest differences were in long-term unemployment, tertiary education and unemployment rate. The final integral indicator of the Praha region was 95.81 points. The region of Praha was followed by the regions of Jihozápad, Jihovýchod, Severovýchod and Střední Čechy. The lowest point assessment of less than 55 points was scored by the regions of Moravskoslezsko and Severozápad.

The graphs below show the points assessments of the Hungarian regions (Graph 5.3) and Polish regions (Graph 5.4).

The Hungarian regions were rated best among the V4 regions in life expectancy and fertility rate. The worst rated were infant mortality rate and long-term unemployment rate. The highest value of integral indicator was recorded by the region of Közép-Magyarország (70.80

points). The gap among other regions is not wide, the least number of points (less than 54 points) were scored by the regions of Észak-Magyarország and Észak-Alföld.

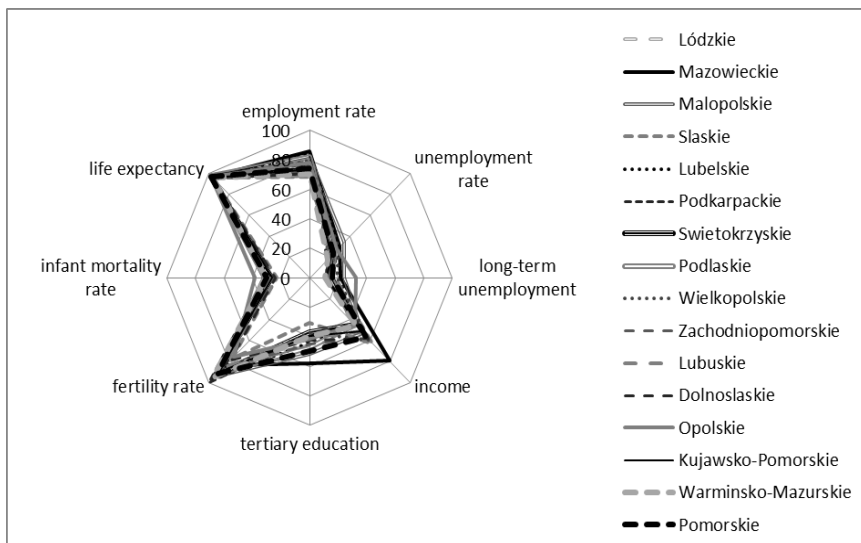
Graph 5.3: Point assessment of the Hungarian regions in 2000



Source: authors' own calculations and elaboration

A fairly balanced assessment in almost all indicators was recorded in the Polish regions. The best rated were life expectancy, fertility rate and employment rate. The worst rated was long-term unemployment. The highest value of integral indicator was recorded by the region of Mazowieckie (60.96 points). Two points less was scored by the region of Malopolskie. Less than 50 points were scored by the regions of Dolnoslaskie and Slaskie.

Graph 5.4: Point assessment of the Polish regions in 2000



Source: authors' own calculations and elaboration

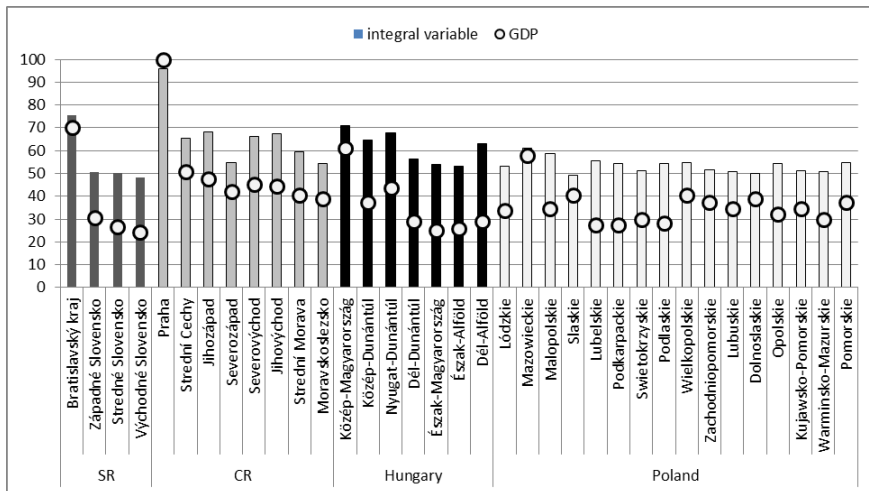
Graph 5.5 illustrates the resulting value of the d_i integral indicator in the V4 regions in 2000 compared to the point value obtained for GDP per capita.

Regarding the point assessment of the selected indicators, the graph shows that the highest scoring were the capital regions of Praha, Bratislava and Közép-Magyarország. Following are the Czech and Hungarian regions. The Polish capital region of Mazowieckie was ranked 11th. The region of Mazowieckie was followed by Polish and Slovak regions. The lowest point assessment was reached by the region of Východné Slovensko (48.20 points). Less than 50 points also scored the regions of Slaskie and Dolnoslaskie.

Having compared the region's score in selected indicators and the score for GDP per capita in PPS, it is obvious that except for the capital regions, all the remaining regions received a lower score for GDP than for the other indicators. This is due to the fact that GDP per capita is more

pronounced between the regions with the capital and the other regions, as is the case for the other indicators under examination.

Graph 5.5: Comparison of the point assessment and GDP of the V4 regions in 2000

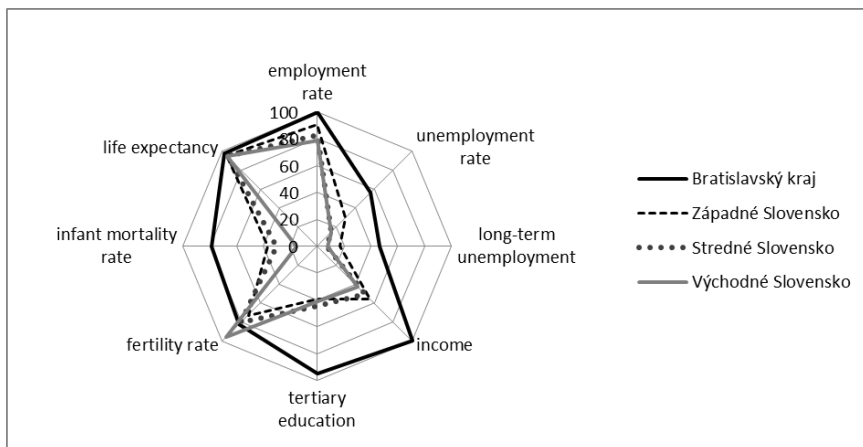


Source: authors' own calculations and elaboration

5.1.2 Performance assessment of the V4 regions in 2008

Late 2008 saw the effects of the global economic recession, which, however, did not reflect much in the year-round data. V4 economies were still enjoying favourable economic growth, low unemployment and moderate inflation as shown in the indicator values. The graphs below show the point assessments of the Slovak regions (Graph 5.6), Czech regions (Graph 5.7), Hungarian regions (Graph 5.8) and Polish regions (Graph 5.9) in selected indicators in 2008.

Graph 5.6: Point assessment of the Slovak regions in 2008

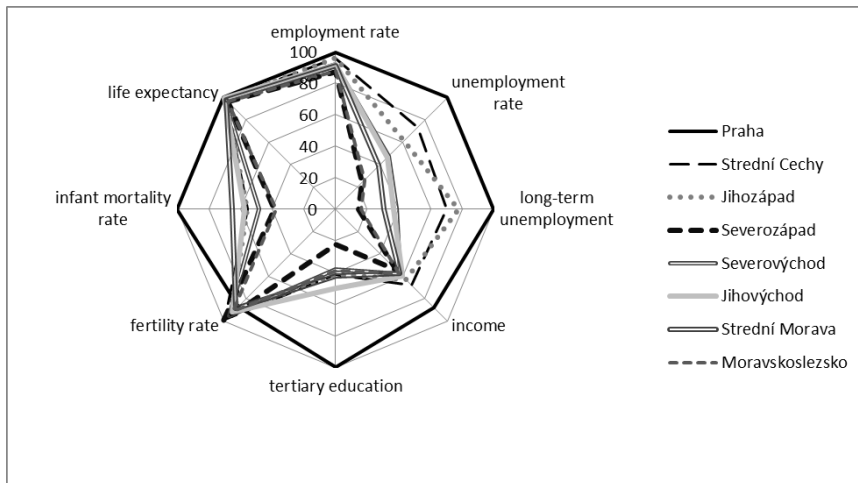


Source: authors' own calculations and elaboration

As in 2000, the region of Bratislava performed best in 7 out of 8 indicators. The highest fertility rate was recorded in the region of Východné Slovensko. The region of Bratislava reached the best value in employment rate and income indicators from within the V4 regions. The region of Bratislava scored over 90 points in the following indicators: life expectancy and tertiary education.

In the Slovak Republic, the biggest differences were in infant mortality, income, unemployment rate and long-term unemployment rate. Slight differences were in life expectancy. In the region of Bratislava, the value of integral variable d_i was 81.98 points, i.e. 6.29 points more in comparison to 2000. The region of Západné Slovensko scored 54.63 points (more than in 2000). Compared to 2000, no major changes in point assessments were recorded: the region of Stredné Slovensko scored 50.63 points and the region of Východné Slovensko scored 48.87 points.

Graph 5.7: Point assessment of the Czech regions in 2008



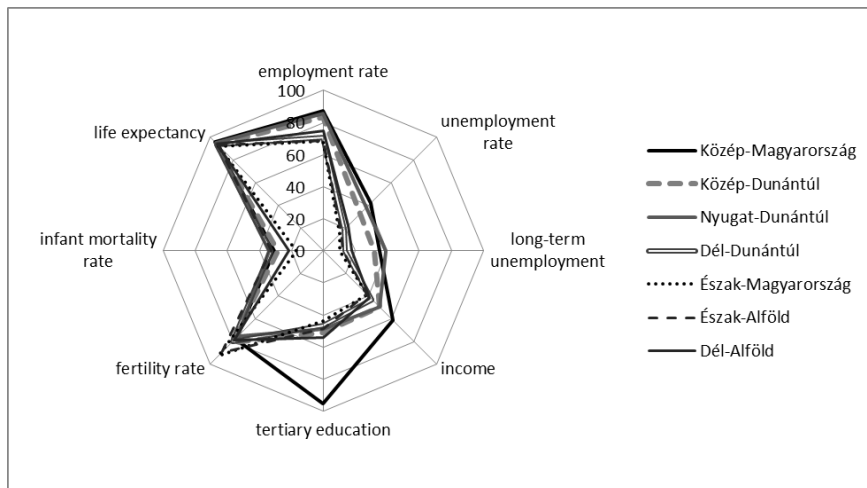
Source: authors' own calculations and elaboration

The region of Praha was the best performing region in 2008 as well. The region of Praha recorded the best values in five indicators from within the V4 regions. In the employment rate indicator, the region of Praha just came close the region of Bratislava. The region of Praha scored 88.08 and 87.04 points in income and fertility rate respectively. Among the Czech regions, however, there was the lowest fertility rate. It follows from the Graph 5.7 that the biggest differences in the Czech Republic remain in long-term unemployment, tertiary education and unemployment rate. The final integral d_i indicator values in the Czech regions ranged from 54.58 points (the region of Severozápad) to 96.79 points (the region of Praha).

The region of Közép-Magyarország was not that well performing as the region of Praha. Among the Hungarian regions, the region of Közép-Magyarország recorded the best values in five indicators, and the biggest gap among other regions was in tertiary education. In 2008, all the Hungarian regions were rated worse than in 2000. The region of Közép-Magyarország scored 65.64 points. The lowest scored was the region of

Észak-Magyarország, (only 47.19 points). Two other regions of Dél-Dunántúl and Észak-Alföld scored less than 50 points.

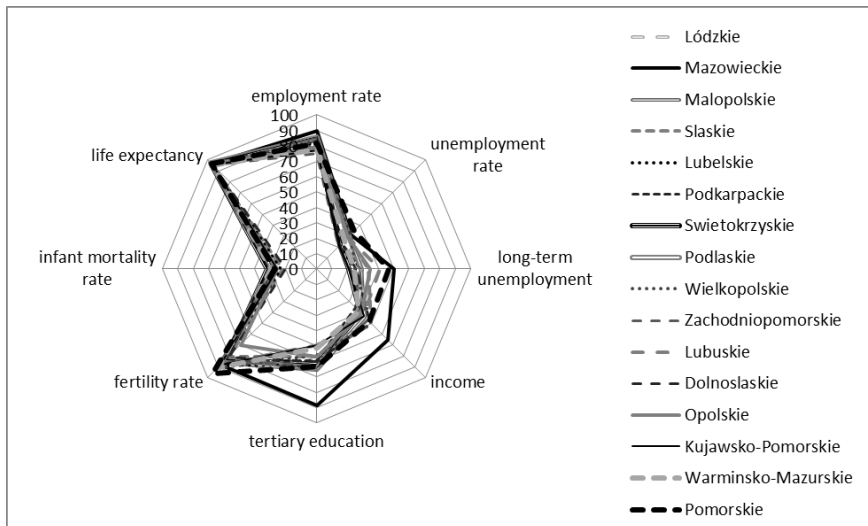
Graph 5.8: Point assessment of the Hungarian regions in 2008



Source: authors' own calculations and elaboration

As in 2000, a fairly balanced assessment in almost all indicators was recorded in the Polish regions. The biggest gap among the region of Mazowieckie and the remaining regions was in the tertiary education and income. The best rated were the life expectancy, employment rate and fertility rate. The worst rated was the infant mortality rate. The region of Mazowieckie increased its point assessment to 69.60 points compared to 2000. The regions are followed by the regions of Pomorskie and Malopolskie. The worst rated were the regions of Kujawsko-Pomorskie and Dolnoslaskie (approx. 53 points).

Graph 5.9: Point assessment of the Polish regions in 2008

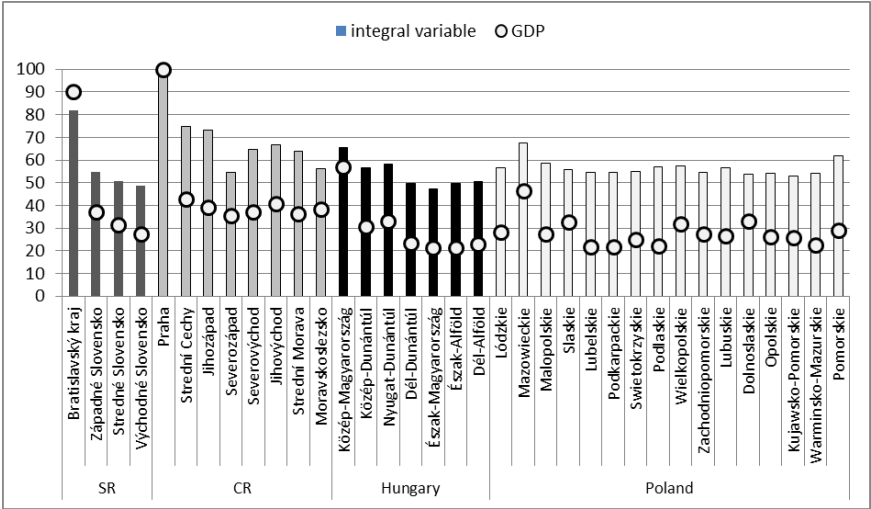


Source: authors' own calculations and elaboration

Graph 5.10 illustrates the resulting value of the d_i integral indicator in the V4 regions in 2008 compared to the point value obtained for GDP per capita.

Regarding the point assessment of the selected indicators in 2008, the graph shows that the highest scoring was the capital region of Praha with the highest GDP per capita. Next follow the region of Bratislava with a higher GDP per capita than was the d_i integral indicator (the average of the eight indicators under examination) Some Czech regions had scored better than the Mazowieckie and Közép-Magyarország regions. Less than 50 points scored three Hungarian regions and the region of Východné Slovensko. The most balanced were the Polish regions.

Graph 5.10: Comparison of the point assessment and GDP of the V4 regions in 2008



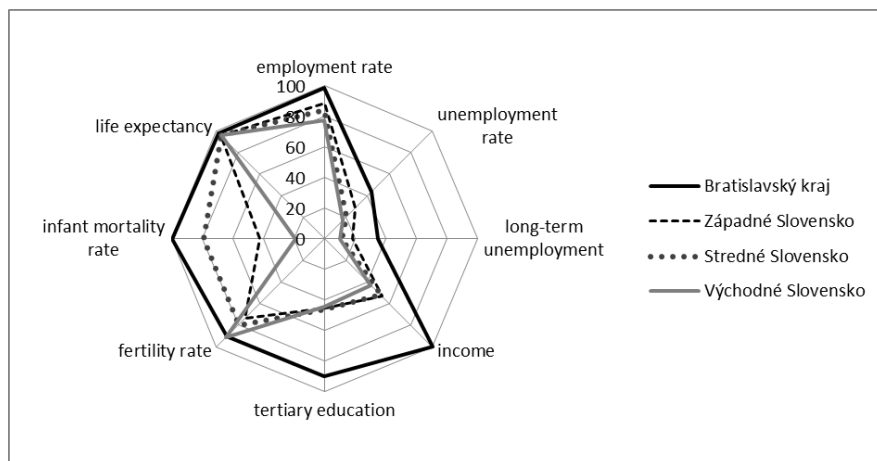
Source: authors' own calculations and elaboration

As in 2000, except for the regions of Praha and Bratislava, all the remaining regions received a dramatically lower score in GDP than in the other indicators.

5.1.3 Performance assessment of the V4 regions in 2016

The year of 2016 was the last year in the time series for which the data were available for all the indicators under examination. In 2016, V4 countries faced moderate economic growth, favourable labour market trends, very low price increases, i.e. deflation. Favourable development had a positive impact on the regional indicator values under examination. The graphs below show the point assessments of the Slovak regions (Graph 5.11), Czech regions (Graph 5.12), Hungarian regions (Graph 5.13) and Polish regions (Graph 5.14) in selected indicators in 2016.

Graph 5.11: Point assessment of the Slovak regions in 2016

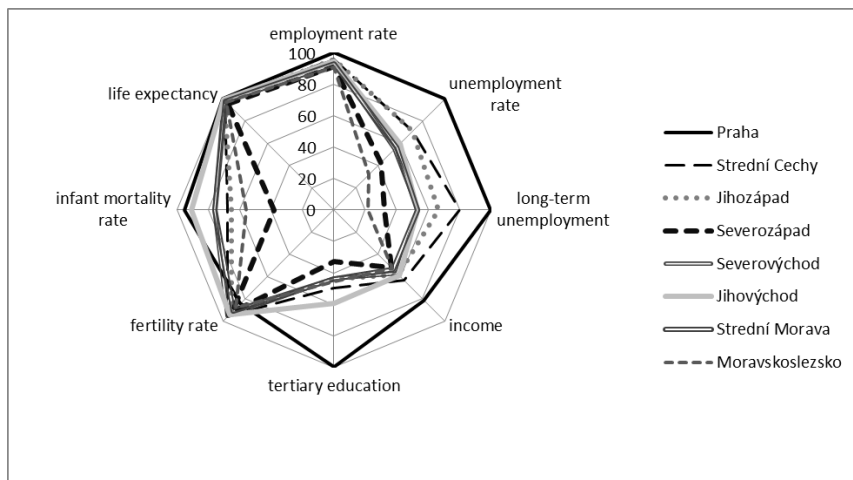


Source: authors' own calculations and elaboration

As in 2000 and 2008, the region of Bratislava performed best in 7 out of 8 indicators. Even in the value of fertility rate, the region of Bratislava was gradually catching up with the region of Východné Slovensko. The region of Bratislava reached the best values in income and infant mortality from within the V4 regions. The region of Bratislava scored over 90 points in other four indicators, thus i.e. the values close to the best regions in the respective indicator.

The Slovak regions scored worst in unemployment rate and long-term unemployment rate. All in all, the best results were achieved in life expectancy. The point assessment of the region of Bratislava was almost that of 2008: 81.85 points. Other Slovak regions improved slightly. The region of Stredné Slovensko scored even better (58.46) than the region of Západné Slovensko (55.72). The region of Východné Slovensko scored only 49.73 points.

Graph 5.12: Point assessment of the Czech regions in 2016



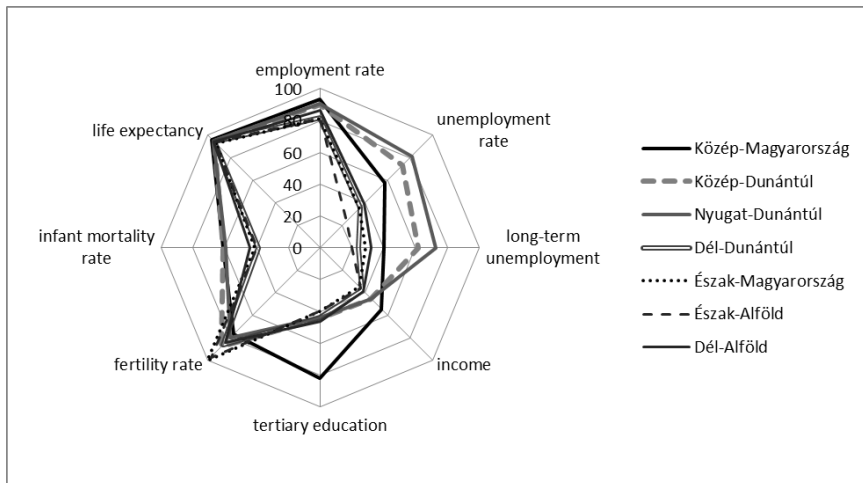
Source: authors' own calculations and elaboration

The region of Praha was the best performing region in five indicators from within the V4 regions. The region of Praha scored best in 7 indicators among the remaining Czech regions. Overall, the Czech regions are best performing in life expectancy, employment rate and fertility rate. Concerning these indicators, there were the slightest inter-regional differences. Pronounced interregional differences were in unemployment rate, long-term unemployment rate and tertiary education.

In comparison to 2008, the final integral d_i indicator value decreased slightly to 95.05 points in the region of Praha. The lowest point assessments received the regions of Severozápad (59.49) and Moravskoslezsko (60.50).

In Hungary in 2016 compared to 2008, regional disparities in unemployment rate and long-term unemployment rate increased.

Graph 5.13: Point assessment of the Hungarian regions in 2016



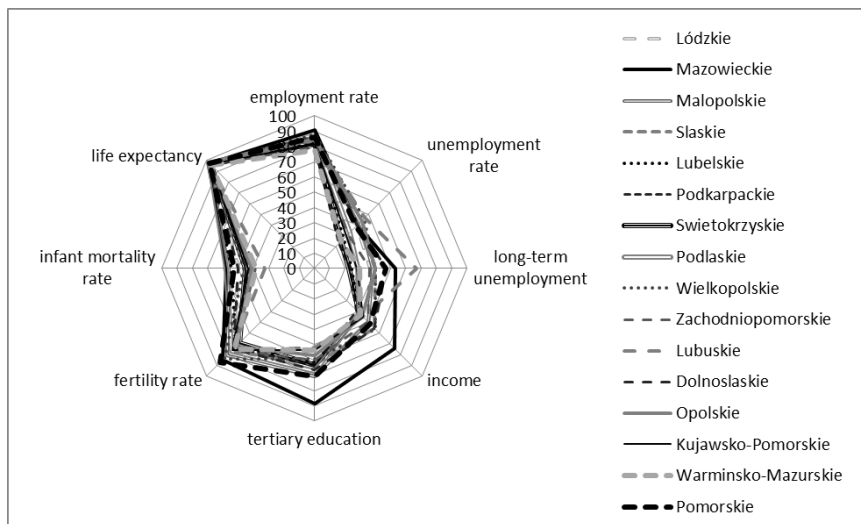
Source: authors' own calculations and elaboration

In 2016, the region of Nyugat-Dunántúl (71.10 points) was ranked first in the overall ranking of selected indicators. The region of Közép-Magyarország (70.25 points) was ranked second and the region of Közép-Dunántúl was ranked third. The lowest-performing was the region of Észak-Alföld (53.89 points). The region of Észak-Magyarország scored best among the V4 regions in the fertility rate. Having compared the 2016 and 2008 point assessments, the Hungarian regions were rated better in 2016.

In 2016, the differences among the indicator values of the Polish regions were greater than in 2008. Major differences were in long-term unemployment and unemployment rate. The regions of Poland shared similar assessment in life expectancy.

The highest value of d_i integral indicator was recorded by the region of Mazowieckie (73.32 points). Among the Polish regions, the region of Mazowieckie recorded the best values in four indicators. The lowest scored was the region of Warminsko-Mazurskie (54.55 points). The regions of Podkarpackie and Swietokrzyskie scored just above 55 points.

Graph 5.14: Point assessment of the Polish regions in 2016

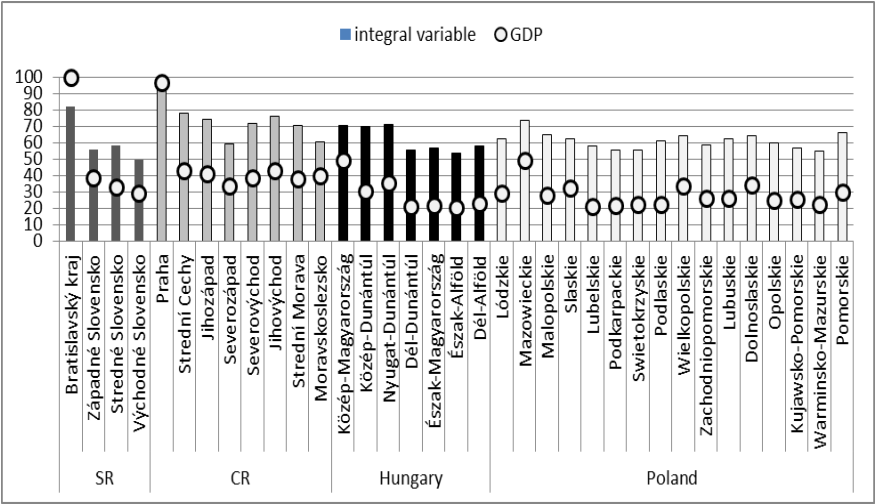


Source: authors' own calculations and elaboration

Graph 5.15 illustrates the resulting value of the d_i integral indicator in the V4 regions in 2016 compared to the point value obtained for GDP per capita.

In 2016, the region of Praha was the best performing region in all the indicators under examination with the exception of GDP per capita which was the highest in the Bratislava region. Generally, high ranked were the Czech regions. The region of Mazowieckie was ranked 6th and the region of Közép-Magyarország ranked 10th. The lowest ranked was the region of Východné Slovensko. GDP per capita was lowest in some Hungarian and Polish regions. Except for the regions of Praha and Bratislava, all the remaining regions received a dramatically lower score in GDP than in the other indicators.

Graph 5.15: Comparison of the point assessment and GDP of the V4 regions in 2016



Source: authors’ own calculations and elaboration

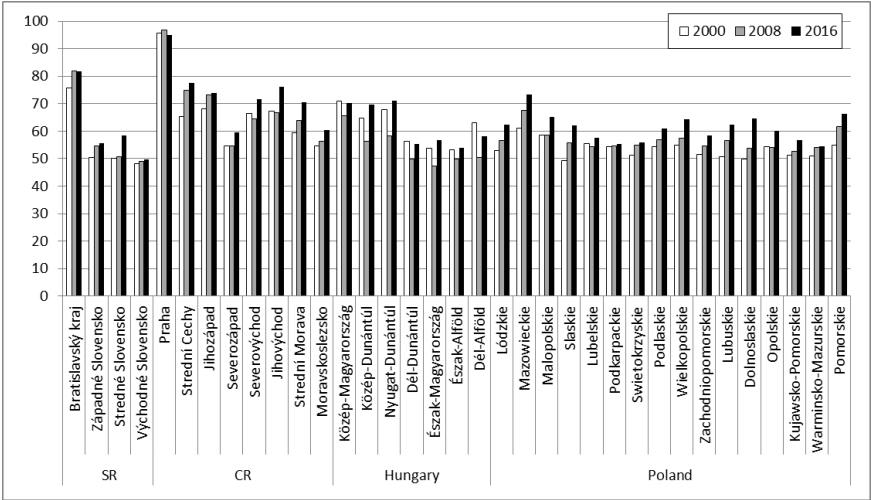
5.1.4 Overall comparison of the point assessments of the V4 regions

From 2000 to 2016, there were a number of fluctuations in the V4 region assessments. Graph 5.16 shows the overall comparison of the V4 region integral indicator values in 2000, 2008 and 2016.

It follows that the best results were achieved by the regions of Praha and Bratislava, but their point value slightly decreased in 2016 compared to 2008. The worst assessed was the region of Východné Slovensko. The rating of most V4 regions reached was higher in 2016 than in 2008. All the regions of Poland and the Czech Republic did improve, with the exception of the Praha region.

From 2000 to 2016, the region of Dolnośląskie achieved the greatest improvement of more than 14 points. The improvement of more than 12 points achieved the regions of Slaskie, Mazowieckie and Střední Čechy. On the other hand, the worst deterioration, by almost 5 points, was recorded in the region of Dél-Alföld.

Graph 5.16: Overall comparison of the V4 regions in 2000, 2008 and 2016



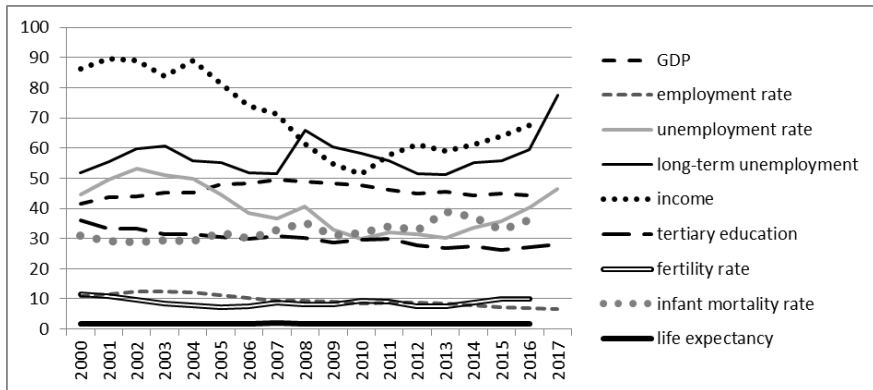
Source: authors' own calculations and elaboration

The results of the above analyses show that the performance differences in the V4 region are slightly decreasing, as most regions are slowly reaching the level of the region of Praha.

5.1.5 Assessment of the variability of selected indicators

In the previous chapters, the development of selected indicators in the V4 regions was examined and compared. It follows from the analyses that the differences among the V4 regions were minimal in some indicators whereas more pronounced in other regions. In this section, the development of the indicator variability will be examined. The variability will be assessed by using the variation coefficient, which is the relative measure of variability. Differences among regions are evaluated as the share of the standard deviation and the arithmetic mean of the respective indicator. The evolution of the coefficient of variation of the indicators under examination from 2000 to 2017 is shown in Graph 5.17.

Graph 5.17: Variability of the indicators under examination in V4 countries



Source: authors' own calculations and elaboration

At the beginning of the time series, the largest relative differences were the highest in the income indicator among the V4 regions. Variability was declining until 2010, yet it was increasing in the following years. From 2008 to 2010 and in 2017, the biggest differences among the V4 regions were in the long-term unemployment rate. These differences were increasing in the final years of the time series. Moderate differences were recorded in the following indicators: unemployment rate, GDP per capita, infant mortality and tertiary education rate. Slight differences were recorded in life expectancy, employment rate and fertility rate.

5.2 Comparative cluster analysis of the V4 regions

Cluster analysis is often used by many authors in their research. Cluster analysis is often used for regional segmentation outside Russia. For example, Kronthaler (2005) identified groups of German regions based on their economic potential. Laboutkova, Bednarova and Valentova (2016) used cluster analysis to study relationship between regional decentralisation and economic imbalances in Europe. Simpach

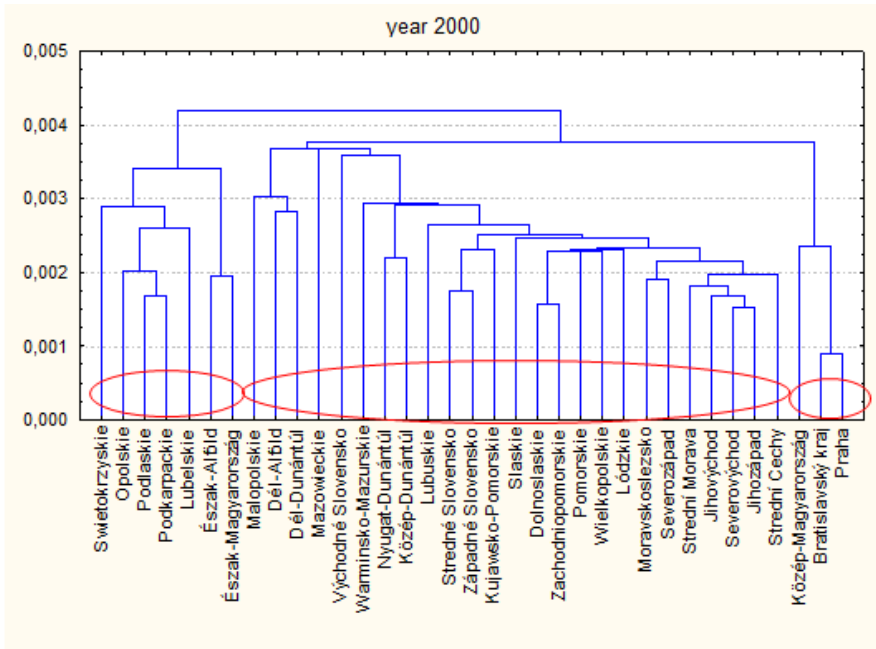
(2013) segmented municipalities in a part of the Czech Republic on the basis of demographic development. Mertlova and Prokop (2015) used a set of macroeconomic indicators for regional clustering. Vahalik and Stanichkova (2016) drew out groups of countries with analogous competitiveness characteristics. Shubat, Bagirova and Šmarová (2017) used this method to assess demographic developments in Russia. Zhang and Li (2014) used cluster analysis to identify groups of Chinese provinces and examine qualitative characteristics of the respective populations. Russian scientists carry out research that draws on cluster analysis for the segmentation of regions based on certain factors, such as the level of development of human capital (Petrykina 2013), levels of business and demographic activity (Ilyshev and Shubat 2008), migration characteristics (Abylkalikov 2015) and so on.

The cluster analysis aims to identify the V4 regions that are similar in indicators such as employment rate, unemployment rate, long-term unemployment, income, tertiary education, fertility rate, infant mortality rate and life expectancy. These indicators play a major role in the development of human potential in the V4 regions. 2000, 2008 and 2016 are analysed and compared. In the research, a hierarchical cluster analysis and Euclidean distance were employed.

5.2.1 Results of the cluster analysis in 2000

Based on the cluster analysis performed on the data available in 2000, Graph 5.18 shows the two main clusters of regions.

Graph 5.18 Dendrogram year 2000



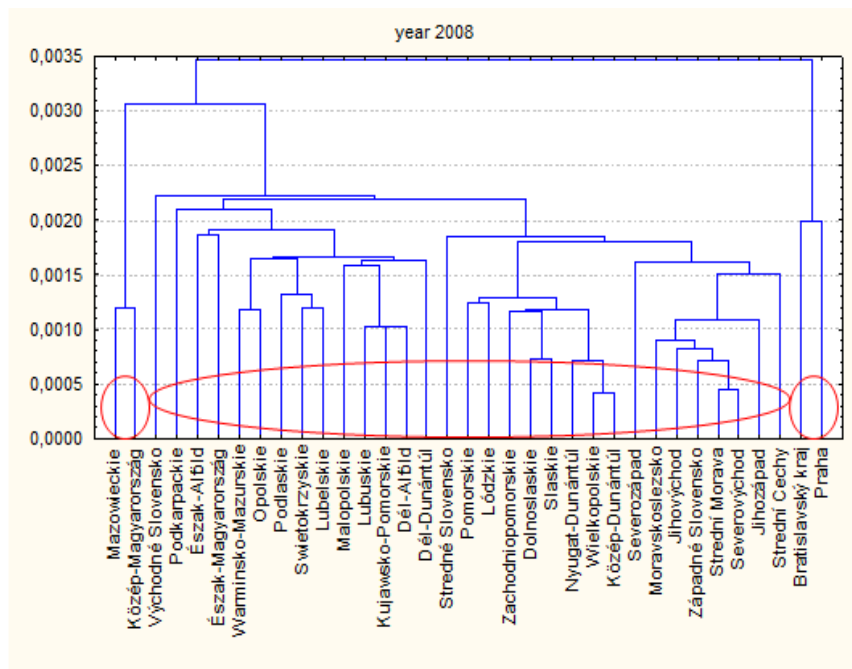
Source: authors' own elaboration in Statistica software

The first cluster contains seven regions, 5 Polish and 2 Hungarian regions. They share similarities mainly in income rates, fertility rates, and also lower employment rates. The second cluster consists of 28 regions. The second cluster contains two sub-clusters. One sub-cluster is made up of only three regions, namely the regions of Praha, Bratislava and Közép-Magyarország. These are the three most developed regions in all V4 countries which feature high employment rates, high incomes, high concentration of people with tertiary education and a relatively high life expectancy. The second sub-cluster is made up of the remaining 25 similar regions. It follows, however, that the region of Střední Čechy is stands closest to the three most developed regions. Next, the Polish region of Malopolskie stands closest to the first cluster weaker regions.

5.2.2 Results of the cluster analysis in 2008

It follows from Graph 5.19 that the most developed V4 regions make up a separate cluster (the regions of Praha and Bratislava).

Graph 5.19 Dendrogram year 2008



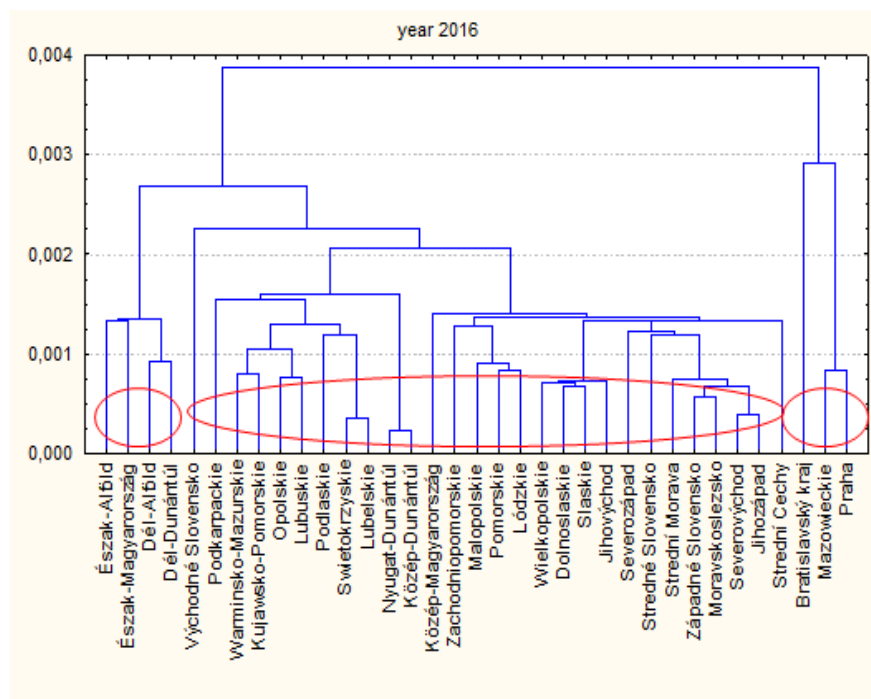
Source: authors' own elaboration in Statistica software

Other regions are placed in the first cluster. Compared to 2000, the region of Střední Čechy joined the first cluster in 2008, even though it is closest to the regions of Praha and Bratislava. The first cluster is again formed by two clusters. One cluster consists of two regions, the Polish region of Mazowieckie and the Hungarian region of Közép-Magyarország, which have the same child mortality rate value but a relatively high tertiary education indicator and a lower fertility rate.

5.2.3 Results of the cluster analysis in 2016

After eight years, the situation changed. In addition to the regions of Praha and Bratislava, the Polish region of Mazowieckie joined the cluster in 2016 as illustrated in Graph 5.20.

Graph 5.20 Dendrogram year 2016



Source: authors' own elaboration in Statistica software

These regions are most similar in the indicators, such as high employment rates, low long-term unemployment rates. In addition, the regions mainly had the highest incomes and highest numbers of people with tertiary education. The remaining 33 regions formed the first cluster with a separate cluster of four Hungarian regions (Dél-Dunántúl, Észak-Magyarország, Észak-Alföld and Dél-Alföld). These regions are mainly similar in the lowest income among all the V4 regions. In addition, lower

values were recorded in life expectancy, relatively high infant mortality rates and unemployment rates.

To sum up, the regions Praha and Bratislava shared important similarities in all three years (2000, 2008, and 2016) in following indicators: employment rate, unemployment rate, long-term unemployment rate, income, tertiary education, fertility rate, infant mortality rate, life expectancy. Their indicator values were the best in comparison to other regions. They are, however, capital regions which are usually the most developed. On the other hand, the cluster with the regions having similar, yet worse indicators values, was made up of different regions each year. They were mainly the Hungarian regions (Dél-Dunántúl, Észak-Magyarország, Észak-Alföld and Dél-Alföld, Közép-Magyarország), Polish regions (in 2000: the regions of Lubelskie, Podkarpackie, Swietokrzyskie, Podlaskie, Opolskie) and Slovak regions (in 2008: the region of Východné Slovensko). In the three years monitored, the cluster with low indicator values never included any Czech regions.

6 RECOMMENDED ECONOMIC AND POLITICAL MEASURES TO BE TAKEN BY DECISION-MAKERS IN THE LIGHT OF REGIONAL DEVELOPMENT IN THE VISEGRAD COUNTRIES

The issues of regional development have been paid special attention not only by economists, sociologists, geographers, or ecologists, but also the European Commission and its economic policy. That is why these issues have been addressed in the Europe 2020 strategy. Similarly, the issues have been regarded as important by the EU member countries, not excluding V4 countries. The results communicated by the scientific community are of interest for politicians and other decision-makers. Their practical application is a good prerequisite for further elaboration and refinement of the proposed methodologies and approaches from which societies may benefit significantly.

Europe is making great efforts to remedy the consequences caused by the economic crisis. The crisis slowed down economic and social growth, and revealed substantial structural weaknesses. From the global point of view, the majority of European regions are facing serious problems related to the environmental protection, the rise of globalization, population aging or deepening of regional and social economic disparities. Moreover, the Visegrad countries had to deal with the issues of the global economic crises of 2007-2010 and devote serious effort and energy to eliminate their consequences. In addition, V4 countries have to address the problems of regional disparities. Regional disparities are primarily mitigated in order to improve the quality of life of European citizens. The efforts to mitigate regional disparities need to be effective in all regions in order the EU regions come close to the principle of equal resources and opportunities.

The analyses have identified several areas that need to be addressed in the V4 regions. Thus, the European Commission has recommended improving performance in the following areas:

- Educational attainment - despite the high share of population with tertiary education, these regions have a relatively high share

of the population with low level of education, or of early school leavers from compulsory education;

- Sustainability of public finances and ensuring efficient public administration with quality services for citizens;
- The labour market due to a relatively high unemployment rates in comparison to those of Western European countries;
- Energy related to the high share of industry in V4 countries and focus on improving energy efficiency through the use of sustainable and eco-friendly technologies (*europa.eu*, 2018).

The European Structural Funds and the EU Operational Programs are also used to meet the objectives and recommendations of the European Commission. Funding sources used by the V4 countries include the following:

- European Regional Development Fund,
- European Social Fund,
- Cohesion fund,
- European Agricultural Fund for Rural Development,
- European Maritime and Fisheries Fund.

Based on the structure of the operational programs of V4 countries, several common areas were identified, such as Environment, Public Administration, Rural Development, Technical Assistance, Infrastructure, Fisheries and Human Resources Development.

The urgent need to mitigate regional disparities requires strategies to create a smart, sustainable, inclusive economy with a high level of employment, education and cohesion in the EU to be developed. With this regard, the role of education of the entire population as well as the identification of new target groups to be educated is becoming more important. As far as inclusive growth is concerned, there are continuous improvements made and optimum conditions created for pursuing inclusive growth in the V4 countries. It is recommended that decision-makers create good conditions for inclusive growth to be pursued, and

focus mainly on policies on equality of access to education at all levels and the removal of barriers to students with disabilities and marginalized groups. The Slovak regions (excluding the Bratislava region) and the regions of Poland are lagging behind mainly in the participation of citizens in education and training. Thus, decision-makers should exactly identify and differentiate entry conditions for making progress in education, identify the process adaptation and procedures for creating conditions for marginalized groups of children and students (in Slovakia, this concerns a relatively large group of Roma children). Furthermore, V4 policies should focus on the qualifications of those working in education at all levels and create a better environment and conditions. Thus, it is necessary to make the teaching profession more attractive and rewarding to young people. This is not only about achieving higher levels of education but also about improving teaching quality.

The quality of education goes hand in hand with the labour market and the indicators of unemployment/employment rates, and labour cost. Thus, decision-makers are to help the business environment as much as possible to get suitable people into jobs. There should be a sufficient number of employees with the right qualifications. It was found that the relative differences in employment rates in the V4 regions showed a downward trend, which is also supported by the fact of the highest disparities recorded in 2002 and the lowest in 2016. In the Czech Republic and Poland, the coefficient of variation in employment rates is significantly lower than in Hungary. From 2007 to 2017, the highest employment rates were recorded in the Czech regions (the region of Praha) and the Slovak regions (the region of Bratislava). Quite high employment rates were found to be in the region of Mazowieckie (Poland) or in the regions of Közép-Magyarország and Nyugat-Dunántúl (Hungary). On the other hand, much lower employment rates were recorded in the vast majority of Hungarian, Polish and Slovak regions.

When establishing conditions for well-functioning labour markets, decision-makers should realize that entrepreneurs cannot change the state of affairs under which the legislative and policy measures are being implemented. Decision-makers cannot solve the problems of the labour market without considering the interests of the business sphere. Thus,

the role and involvement of local chambers of commerce and business associations in tackling problems and accommodating the needs of local business communities must be increased.

In practice, business environment can hardly influence political decision-making. There is, however, some space for at least seeing the chances of opening a dialogue between entrepreneurs, decision-makers and public sector in general. Decision-makers are to make entrepreneurs regard regional and local governments as partners in order to increase trust in public institutions and organizations. In addition, conditions for engaging local business entities in political processes to support regional development should be established. Decision-makers must do their best to help entrepreneurs to hire the right people for their businesses.

Thus, decision-makers should try to reintegrate unemployed people into the labour market. Increased economic growth in the V4 countries is closely related to labour shortages in some industries, as well as some pressure to increase wages. Moreover, household income development in the V4 countries was analysed. There were considerable differences in the household income levels in the V4 regions. In general, the highest earnings were in the Czech Republic and Slovak Republic.

Regarding the individual regions, the highest per capita income was in the region of Prague from 2000 to 2006. From 2006, the highest earnings were found to be in the region of Bratislava, EUR 15,900 in 2015 (EUR 12,100 in the region of Prague in 2015). They are followed by the regions of Mazowieckie and Střední Čechy/Central Bohemia. The lowest income regions include the regions of Východné Slovensko /Eastern Slovakia, Podkarpackie from 2003, Észak-Alföld in 2011 and Észak-Magyarország in the years that followed. In 2000, the income levels in the V4 regions ranged between EUR 2,000-4,300 compared to EUR 4,800-15,900 in 2015. Decision-makers should approach the problem of raising household income with caution, and stimulate employers to employ national labour force in the first place. Replacing national labour force with foreign workers can lead to social tensions. Migration of labour force from abroad can become a problem for resident workers as employers may prefer hiring labour with lower salary requirements. It

should be borne in mind that businesses exist to maximize their profits, not to serve the public interest.

Even though foreign-born workers can help to accelerate economic growth, they should only be hired in industries facing a major labour shortage. Otherwise, national labour force might think that immigrant workers are taking their jobs and pushing wages down. Thus, decision-makers and active labour market measures should primarily focus on identifying and removing barriers for jobseekers.

It should, however, be kept in mind that the labour market demand is linked to education policy. Thus, high demand for workers in the manufacturing sector should be reflected in the education policies of countries. At the macroeconomic level, decision-makers should know what they want their economies to focus on. Thus, the V4 countries should give most of their attention to high added value investments.

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Centre of Sociological Research

Szczecin, Poland 2018

ISBN 978-83-952923-0-9

EAN 9788395292309