



Changes in the Educational Structure of the Workforce in Slovakia and Its Regions

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Abstract: Educational attainment plays a critical role in everybody's employment options. Education determines human development, and affects the economic development of countries. For this reason, the educational structure of the population has long been considered an important indicator of the overall maturity and development of the country. In connection with technical progress and the use of advanced technologies, the demands for tertiary education attainment in the workforce are growing. The purpose of the paper is to evaluate changes in the structure of the workforce in terms of educational attainment in the Slovak Republic and to find the relationship between the educational attainment and economic performance of the regions of the Slovak Republic. The educational attainment of the workforce in the Slovak Republic is developing positively. However, significant regional differences have been identified, and it is possible to see a big gap between the Region of Bratislava and the remaining Slovak regions. In recent years, there has been a marked improvement in the educational attainment of the workforce in the Region of Košice. Tertiary education attainment of the workforce has an impact on the creation of regional gross domestic product per capita.

1. INTRODUCTION

Education plays a vital role and performs many important functions in society. From the economic point of view, the function of education is perceived as an interplay between economy and education (Žižková et al., 1989). The authors argue that the economic effects of education contribute considerably to the development of the subjective factor of the social reproduction process, to the development of the workforce qualification and work-related abilities. Thus, the educational structure of a country's workforce is considered to be a major factor in determining how well the economy of the country will perform.

The paper attempts to identify changes in the labour force structure in the regions of the Slovak Republic and to investigate the relationship between the educational attainment and economic performance of the Slovak regions.

2. LITERATURE OVERVIEW

Human capital refers to a special form of capital, whose representatives are human beings with their qualities, experience, knowledge. Human capital is also defined as the ability of people to create new knowledge or as the totality of innate and acquired abilities, knowledge, experience,

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habits, motivation and energy that people possess and can use to produce products over a period of time (Vidova, 2018). Although intangible, human capital is inseparable from human beings and is associated with their physical form. It is the priceless and most important economic resource of society, and the main factor of economic growth and an important source of competitive advantage (Krajňáková, 2014).

The value of human capital is closely related to a person's age and education. Hajšová (2014) believes that the knowledge that an individual acquires, whether through education or experience, has a significant impact on the formation and transfer of an individual's human capital to the benefit of groups, institutions and society. According to Bobáková (2018), highly skilled and educated people are better adaptable to changing labour market, and the individual returns to their work and education are high in terms of wages. Belajová et al. (2014) state that higher levels of education and training provide individuals with a greater chance of getting and retaining a job or finding a new one. On the one hand, good education serves to increase an individual's socio-economic status. On the other hand, human capital also has benefits of non-economic nature, as well-educated people have better health and live longer. In addition, education has impact on civic participation, such as volunteering and charitable giving. Education is an important factor of human capital. It is the outcome of learning. It is a process, in which the informative element is the strongest one, and under which individuals acquire and learn a body of knowledge, skills and habits as well as the methods of acquiring them. The body of knowledge has specific purposes as it serves to pursue a career or to cultivate or shape human personality (Ďurič, Hotár and Pajtinka, 2000, p. 500). The quality of education determines skills in the adult population, composition of the workforce (the share of those employed in low-skilled occupations) and the quality of the business environment (Karšay, 2019). In their paper, Zhao and Watterston (2021) cite several authors (Duckworth and Yeager, 2015; Zhao et al. 2019) who maintain that the acquisition of a set of skills, such as creativity, curiosity, critical thinking, entrepreneurship, collaboration, communication, global competence, and other skills is on the rise in the field of education. In addition, IT skills have been highly demanded by the labour market. That is why the skills required from workers have been altered. Strong emphasis has been placed on problem solving skills, creativity, socioemotional skills, functional literacy and technical skills related to the use of digital technologies (Jandrić & Randelović, 2018). Technological innovation is expected to affect the size of the labour market. In the Europe 2020 strategy, An Agenda for New Skills and Jobs was among the key initiatives to modernise labour markets and empower people by developing their skills throughout the lifecycle (Martyntenko and Menshykov, 2017). Labour market needs for change also affect the development and growth of a country's economy and its regions.

Belajová and Fáziková argue (2005) that changes in a region's economy can lead to growth, development, stagnation or decline of the region. The authors note that economic development goes hand in hand with qualitative changes in the region, such as improvements in the environment, better technology to provide health, education or other services, better development-related value parameters, an increase in the workforce qualification level, etc. Tvrdoň and Šuranová (2007) believe that the essence of regional and EU competitiveness is represented by two indicators, i.e. productivity and employment in the regions. The indicators are under the influence of both internal factors, which are based on the position of businesses in the region and external factors, represented by states and regions. External factors encompass for instance the sectoral structure of the economy, technological and technical innovation, infrastructure (both technical and intellectual), organisation, governance, capacity for cooperation between systems, etc. All

factors have a direct or indirect impact on various actors of regional development in the territory. Habánik (2007) considers the support of the sectors that account for the highest share of value added to be one of the most important factors of regional development.

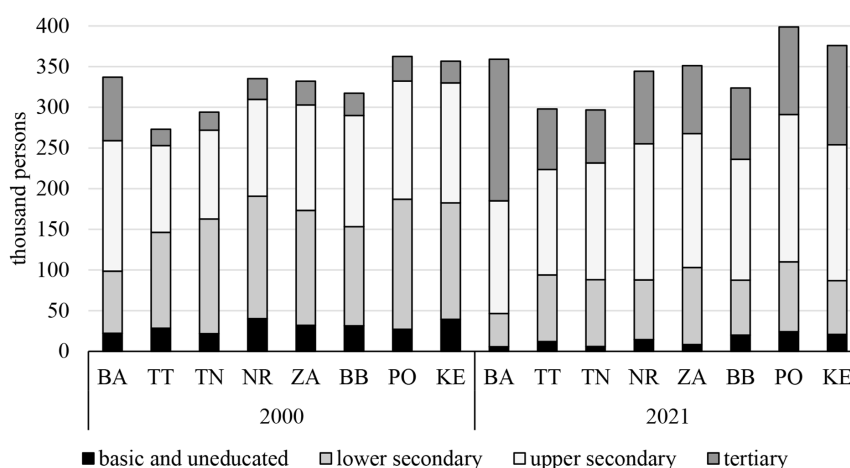
3. METHODOLOGY

The paper addresses changes in the labour force structure in the regions of the Slovak Republic. It is necessary to investigate the changes over a longer period of time, so the comparison is done for 2000 and 2021. In addition to assessing the changes in the structure of the labour force and identifying the differences in the educational attainment structure of the labour force, the paper attempts to establish the relationship between educational attainment and the economic performance of the Slovak regions. Gross domestic product per capita is used to assess the economic performance of the regions.

Research work and professional publications of Slovak and foreign authors were used to write the theoretical framework of the issue. Statistical data were taken from the DATAcube database of the Statistical Office of the Slovak Republic. In addition to the time series analysis, the methods of comparison and synthesis were employed. The percentage of the labour force with the relevant educational attainment level in the total labour force is calculated and the dependence between the share of the labour force with a university degree and the performance of each region is determined.

4. RESULTS

In Slovakia, a long-term favourable trend can be observed in the evolution of the educational attainment of the population. It is true, however, that significant disparities between regions keep being present. Figure 1 shows the structure of the labour force or economically active population in the regions of the Slovak Republic in 2000 and 2021.



Legend: BA – Bratislava region, TT – Trnava region, TN – Trenčín region, NR- Nitra region, ZA – Žilina region, BB – Banská Bystrica region, PO – Prešov region, KE – Košice region

Figure 1. Labour force structure by educational attainment in the Slovak regions in 2000 and 2021

Source: Statistical Office of the Slovak Republic (2021)

As can be seen in Figure 1, the largest number of economically active persons was in the Region of Prešov (362.4 thousand) and the Region of Košice, followed by the Region of Bratislava, the Region of Nitra and the Region of Žilina in 2000. The least number of economically active persons was in the Region of Trnava (273 thousand persons). In the structure of the economically active population, upper secondary and lower secondary education prevailed.

In 2021, the situation was different. The number of economically active persons increased in comparison to 2000 in all regions. The largest labour force was in the Region of Prešov (398.9 thousand persons) and the gap between the Region of Prešov and Košice and Bratislava regions increased. The Regions of Trenčín and Trnava have the lowest number of economically active persons. In 2021, the structure of the labour force was dominated by complete secondary and higher education in the Region of Bratislava.

To better illustrate the comparison of educational attainment of the labour force, the percentage of economically active persons by educational attainment in each region was calculated, as shown in Figure 2.

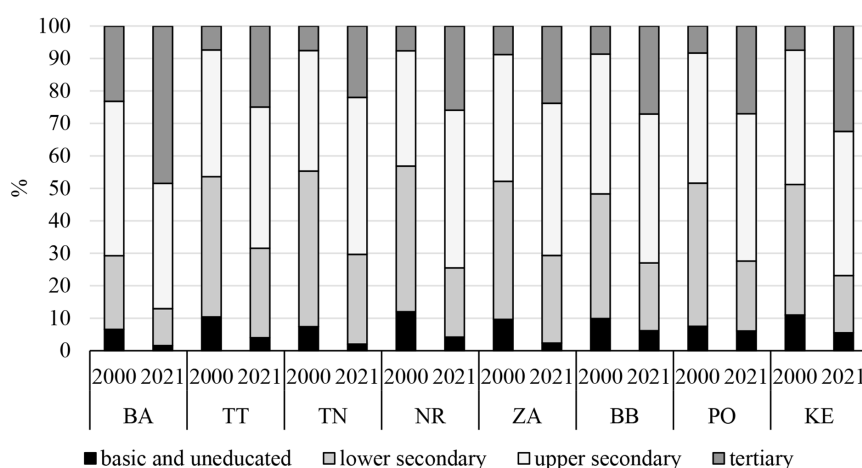


Figure 2. Proportion of labour force by educational attainment in the Slovak regions in 2000 and 2021

Source: Statistical Office of the Slovak Republic (2021), own calculations

Figure 2 shows major differences in the structure of economically active persons in the regions of the Slovak Republic in 2021 compared to 2000. The highest share of economically active persons with tertiary education attainment was in the Region of Bratislava, namely 48.44% in 2021. The Region of Bratislava was followed by Košice Region with 32.47% of the workforce with tertiary education attainment in 2021. The Region of Trenčín, on the contrary, had a mere 21.97% of the workforce with tertiary education attainment in 2021.

Changes in the percentage of economically active persons in the Slovak regions in 2021 compared to 2000 were calculated. The results are listed in Table 1.

Table 1 shows a decrease in the share of the labour force with primary or no education in all Slovak regions. The largest decrease was recorded in the Region of Nitra. Similarly, the share of the labour force with lower secondary education decreased in all regions, most of all in Nitra, Košice and Žilina Regions. There was, however, an increase in the share of the labour force with full secondary education, with the exception of the Region of Bratislava, which saw a decrease

by almost 9 p.p. Major changes could be observed in the data related to workforce having tertiary education attainment. The highest increase in the share of the workforce with tertiary education was found in the Region of Bratislava and the Region of Košice, by more than 25 p.p. The smallest increase was recorded in the Region of Trenčín, a mere 14.42 p.p.

Table 1. Changes in the proportion of labour force by educational attainment in 2021 compared to 2000 (p.p.)

	BA	TT	TN	NR	ZA	BB	PO	KE
Basic and Uneducated	-5.00	-6.37	-5.36	-7.81	-7.30	-3.78	-1.44	-5.49
Lower Secondary	-11.30	-15.66	-20.28	-23.55	-15.56	-17.49	-22.56	-22.57
Upper Secondary	-8.98	4.46	11.22	13.07	7.86	2.84	5.28	3.04
Tertiary	25.28	17.61	14.42	18.26	14.98	18.43	18.67	25.02

Source: Statistical Office of the Slovak Republic (2021), own calculations

Since educational attainment has a significant impact on the economic performance of regions, the dependence of the share of the labour force with tertiary education attainment and the regional GDP per capita in the Slovak regions in 2000 (left graph) and 2020 (right graph) is illustrated in Figure 3. The data on regional GDP per capita for 2021 are not available, yet.

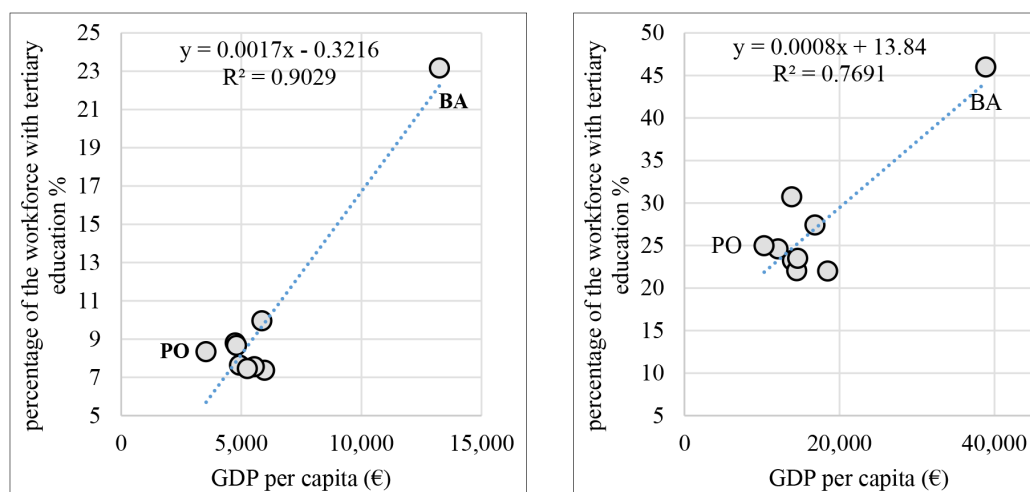


Figure 3. Dependence of the share of the labour force with tertiary educational attainment and the regional GDP per capita in the Slovak regions in 2000 and 2020

Source: Statistical Office of the Slovak Republic (2021), own processing

It was found that the share of people with tertiary education has a positive impact on regional economic performance. In 2000, the highest share of the workforce with tertiary education attainment and GDP per capita was found to be in the Region of Bratislava. The remaining regions follow by a wide gap, with minor disparities among them. The coefficient of determination (0.9029) shows a high dependence between the variables.

In 2020, both GDP per capita and the share of the workforce with a university degree were much higher than in 2000. A huge gap can again be seen between Bratislava Region and the remaining Slovak regions. The differences across other regions have slightly widened. The coefficient of determination decreased moderately (0.7691), and the value also indicates a high dependence between the variables.

5. CONCLUSION

Qualified human resources are essential in the process of knowledge creation and transfer into businesses and regions. Thus, human resources contribute considerably to the productive capacity of countries, which is a prerequisite for sustainable economic growth and global competitiveness.

The research findings indicate changes in the number of economically active persons between 2000 and 2021 in the Slovak regions. The changes were positive ones as the number of labour force grew. The biggest growth was recorded in the Region of Prešov. The lowest number of labour force had the Regions of Trenčín and Trnava. The changes also affected the structure of the labour force in a good way. In 2000, upper secondary and lower secondary education attainment prevailed in the structure of the labour force, whereas complete secondary education was dominant in 2021. In the Region of Bratislava, tertiary education attainment was prevailing in 2021, accounting for 48.44%. In 2000 and 2021, the share of the workforce with primary education or no education, and lower secondary education decreased in all Slovak regions.

A direct dependence was found between the share of the labour force with post-secondary education and GDP per capita in the regions of the Slovak Republic in 2000 and 2020. The highest proportion of the labour force with tertiary education attainment and the highest GDP per capita was in the Region of Bratislava. There is a wide gap between Bratislava Region and the remaining Slovak regions. There were no big disparities across the other Slovak regions, even though a slight increase in differences could be seen in 2020 compared to 2000.

We believe that educational attainment is just one of the factors having an impact on the value of human capital. Therefore, our further research shall be focused on a multi-criteria assessment of the human capital quality and identification of disparities across the Slovak regions.

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