

NEXUS AMONG UNEMPLOYMENT, POVERTY AND CRIME IN SLOVAKIA

^aEMÍLIA DUĽOVÁ SPIŠÁKOVÁ, ^bBARBORA GONTKOVIČOVÁ

Faculty of Business Economy with seat in Košice, University of Economics in Bratislava, Tajovského 13, 041 30, Košice, Slovakia

email: ^aemilia.dulova.spisakova@euba.sk,

^bbarbora.gontkovicova@euba.sk

This research was supported by research projects VEGA 1/0338/22: European Union and Strategy Europe 2020 in mirror of the Priorities and Challenges of the Agenda 2030, KEGA 035EU-4/2022: Achieving the goals of the 2030 Agenda for Sustainable Development under the influence of the global pandemic COVID-19.

Abstract: The deepening of social differences can be an incentive for wide-spectrum crime. First the pandemic, then the war conflict in Ukraine and the energy crisis with effects on inflation rate resulted in many residents facing existential problems that change their behavior. These, in the worst case, can result in the commission of crime. Therefore the main aim of the article will be to evaluate the relation between crime, unemployment and poverty in conditions of Slovak republic. A partial aim will be to find out whether long-term unemployed people contribute more to the commission of crime, and whether the level of education achieved by the unemployed has an impact on the commission of individual types of criminal acts.

Keywords: unemployment, poverty, crime, education.

Introduction

Dynamic social development, the transformation of the economy and property relations were reflected in the long-term social differentiation of society, the increase in unemployment and the loss of social security for a significant group of the population. The deepening of social differences can be an incentive for wide-spectrum crime. The current situation was exacerbated by the consequences of the COVID-19 pandemic and the war conflict in Ukraine. Business closures, production restrictions and suspensions, the paralysis of the service sector during the corona crisis and high inflation as a result of the war conflict have brought many households closer to the poverty line. Several residents face even existential problems that change their behavior, which in the worst case can result in committing criminal activity. Therefore, the article will focus on the issue of relation between crime, unemployment and poverty. The topicality of the issue is underlined by the fact that all three monitored areas represent partial goals of Agenda 2030. In defined lines, they develop the state achieved in the EU member states based on the fulfillment of the targets of the Strategy Europe 2020, while reflecting on the need to incorporate the principle of sustainability in the monitored areas.

1 Theoretical framework

Unemployment, poverty and crime represent a societal problem that must be solved. Loss of job and inability to find a suitable job, or unwillingness to work in general or because of low pay, lowers the living standard of residents in some regions. Due to no or very low income in the form of various benefits received from the state, these people are a risk group that could represent potential perpetrators of crimes.

The criminal phenomenon is influenced by economic and sociocultural factors, such as population density, unemployment, income, poverty and education (Mokline, 2018) and a number of negative effects generated by the contradiction of these relationships (Larii, David, 2019). Crime is one of the big problems facing various countries, whether developed or developing, and it is difficult to avoid (Armin, 2020). This term refers to any violation of the law that may result in legal action.

Several studies have proven that unemployment and poverty have a positive and significant impact on crime (Abdila et al., 2022; Badzaghua, Gondauri, 2021; Imran, 2018; Mirjat et al., 2017; Buonanno et al., 2015). Unemployment causes crime in society (Fadaei-Tehrani, Green, 2002) and a decrease in unemployment leads to a decrease in the crime rate (Shah,

Soomro, Mirjat, 2019). According to Jawadi et al. (2021), the maintenance of stable economic activity is crucial for stabilizing the incidence of non-violent crime. This is related to the fact that economic depression causes increased crime, while economic prosperity reduces criminal activity (Armin, 2020).

There are many factors that influence unemployment, poverty and crime, some of which are common. Even education itself offers us multiple perspectives on their mutual connection and casualness (Huang, Maassen van den Brink, Groot 2009). Low education makes it difficult for low-income people to meet their needs. In the midst of globalization, which is marked by a materialistic lifestyle, it is not out of the question that someone will commit an illegal or unnatural act to get money. General expectations in the given area relate primarily to the relationship between long-term unemployment, poverty and crime. On the other hand, it is necessary to point out the fact that education does not guarantee a person's non-criminal behavior. Here the question arises of the relationship between the level of education of unemployed persons and economic crime, which can be claimed as a more sophisticated form (Polák, 2020). According to Kuchta et al (2005), economic crime consists of crimes committed during the business of economic entities, especially by persons operating inside these entities, damaging or threatening individual or collective rights in the economic sphere, abusing the weaknesses of the economic system or its institutions, causing a weakening of trust in the economic and social system, motivated by profit or desire for power, latent in nature and in its mass form threatening the functioning of the rule of law.

Unemployment causes a low level of income. Subsequently, low income leads to poverty. Poverty, as a social problem of society at the local and global level, represents living conditions in which individuals do not reach a minimum standard of living (Shah, Soomro, Mirjat, 2019). The threat of an increase in the poverty rate caused by many unemployed can appear at any time and can result from dissatisfaction with government policies (Abdila et al., 2022). Therefore, the state has the power in its hands to adopt the necessary legislation that would actively influence employment, thus preventing poverty and contributing to the reduction of crime. According to Imran (2018), it can be concluded that poverty ultimately leads to property crime. Also important is the subjective view of poverty, which may reflect changes in societies that are not captured by official indicators of poverty (Želinský, 2022).

Long-term unemployment is also a problem, which, according to a study by Nordin and Almen (2017), shows a strong association with violent crime, even greater than the effect of overall unemployment on property crime. The duration of unemployment probably increases the tension that promotes violent behavior (Lalotiot, 2016).

Covid-19 caused that less educated, long-term unemployed and unskilled people to be left behind during the pandemic. If we look at the breadth of social policies and aid programs, we see that they basically covered the economically active population and ignored those who needed it most. This highlight their social isolation and the consequences of the crisis contributed more than ever to their poverty (Kooli, 2022).

The topicality of the investigated issue is also enhanced by the fact that the financial situation of many people has significantly worsened in the form of a cost-of-living crisis, which is driven by high-energy prices, the war in Ukraine and uncontrollable inflation. It was inflation last year that contributed to a significant increase in household living costs, but also to an increase in the input costs of companies (as employers). Lower disposable income, or job loss significantly affects the unemployment rate, exposes the population to the risk of poverty with possible consequences for their behavior that leads to criminal activity.

2 Data and methodology

The last available data from the databases, namely Statistical Office of the Slovak Republic, Eurostat and Ministry of Interior of the SR is used to process the article. All results of the analysis in the form of graphs and tables are processed in Microsoft Office Excel. Mathematical and statistical methods (correlation, regression) were used in addition to standard logic methods intended for processing data (acquisition and data collection, analysis) and making inferences (summarization of results, synthesis).

Correlation analysis determine the degree of association (common variability) of two dependent or functionally undifferentiated variables. A graphical expression of dependence is a correlation graph, where the values of the independent variable are plotted on the x-axis (in our case crime) and the values of the dependent variable on the y-axis (unemployment, long unemployment, and poverty). According to the nature of the distribution of points in the graph, we can estimate how strong the dependence between quantities exists, or there is no dependency. A correlation coefficient is used to express the tightness of the correlation. In the case of a relatively small sample of data and the violation of the normality assumption for some variables, it is appropriate to analyze the files by simple rank correlations using Spearman's rank correlation coefficient matrices. The range of the correlation coefficient determines the strength of the correlation, which can be interpreted as follows: 0.00-0.19 "very weak"; 0.20-0.39 "weak"; 0.40-0.59 "moderate" (*); 0.60-0.79 "strong" (**); 0.80-1.00 "very strong" correlation (***) (Evans, 1996).

It is a non-parametric method describing monotonic dependence, not only linear, but generally increasing or decreasing. A non-parametric characteristic of the dependence of random variables X, Y is the Spearman rank correlation coefficient given by the relation:

$$r_s = 1 - (6\sum d_i^2 / n(n^2 - 1)) \quad (1)$$

where r_s is the coefficient and n is the number of points in the data set. For each point (x_i, y_i) , the square of the difference in the ranks of the two coordinates is represented by d_i^2 and the sum of each of these squares is represented by the expression $\sum d_i^2$.

We verify the statistical significance of the relationship between level of education of unemployed and general and economic crime through regression analysis. It was preceded by tests of normality (Shapiro-Wilk test), autocorrelation (Durbin-Watson test) and heteroskedasticity test (Breusch-Pagan test).

The dependent variable is the crime indicator (Y - total, general and economic), and the independent variables are the indicators of education (X).

$$Y_{it} = \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + U_{it} \quad (2)$$

The coefficient of determination (R-square), F test, and the p-value were used for assessing the suitability of the trend function. R-square is the proportion of the variance in the dependent variable that is predictable from the independent variable(s) and measures the strength of the relationship between the model and the dependent variable on a convenient 0–100% scale. The statistical significance of individual regression coefficients is assessed by p-value. The overall F-test determines whether this relationship is statistically significant.

3 Development trends of unemployment, poverty and crime in Slovakia

In order to fulfill the main aim of the article, we first monitored the development of individual indicators. Based on the latest available data from Eurostat, in 2022 the unemployment rate in Slovakia was at the level of the EU average (6.1 %). Slovakia was followed by southern countries (Cyprus, Greece, Italy, Croatia and Spain), the northern countries of the EU (Sweden,

Finland, Latvia) and also France. The country achieves a worse position in the indicator of long-term unemployment. In 2022, of the total workforce in the country, 4.1 % are unemployed for more than 12 months. Only Italy, Spain and Greece are behind Slovakia.

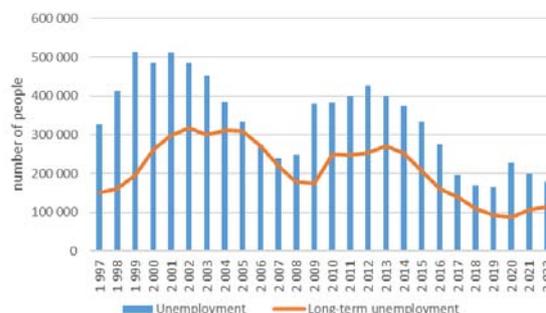


Figure 1. Development of unemployment and long-term unemployment in Slovakia during the period 1997-2022; source: Own processing according to the data from Statistical Office of the Slovak Republic, 2023

Figure 1 shows the development of the total number of unemployed and long-term unemployed persons in Slovakia. Based on the data, it can be concluded that in the long term, the number of unemployed as well as the long-term unemployed is decreasing. More than half a million inhabitants were unemployed in 1999, while the highest number of long-term unemployed was in 2002 (317 000 persons) and they represented up to 65 % of the total unemployment. The pandemic caused by the disease COVID-19 contributed to the year-on-year increase in the number of unemployed by almost 62 000 people (the period of 2019 and 2020), but this was reflected in long-term unemployment until a year later. In 2022, the number of long-term unemployed persons was 26 000 higher than in 2020.

The second evaluated indicator is poverty from the point of view of the development of the total number of persons living below the poverty line and also the development of the poverty rate. Due to the unavailability of data, a shorter time period was monitored.

Compared to the EU member states, Slovakia ranks seventh place in the ranking together with Poland in the poverty rate. The lowest poverty rate (10.2 %) was recorded in 2022 in the Czechia. It was followed by Hungary, Slovenia, Denmark, Finland and Belgium. Conversely, poverty rates of more than 22% were recorded in Latvia, Estonia and Bulgaria (World Population Review, 2023).

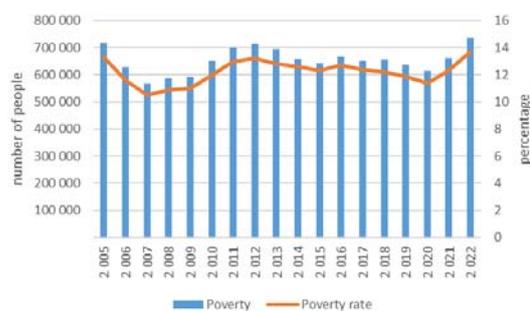


Figure 2. Development of poverty and poverty rate in Slovakia during the period 2005-2022; source: Own processing according to the data from Statistical Office of the Slovak Republic, 2023

If we look at the longer-term development of the indicator in Slovakia (Figure 2), we see that in 2022 the country showed the highest number of people living below the poverty line (735,725 people), which represented 13.7% of the population. On the other hand, the least population at risk of poverty was in 2007, when Slovakia achieved the highest economic growth

among EU member countries and was considered the economic tiger of Europe.

The last indicator entering the subsequent correlational and causal analysis is the crime indicator. The safest country in the EU, in which the fewest crimes are committed, is Slovenia (22.28 crimes), followed by Estonia and Croatia. Slovakia is in 11th place in this ranking with 30.37 crimes per 100 000 inhabitants.

Of the EU member states, France is the country with the highest crime rate, with 52 crimes per 100 000 inhabitants. It is followed by Sweden with 48 crimes, Greece and Ireland with almost 46 crimes per 100 000 inhabitants.

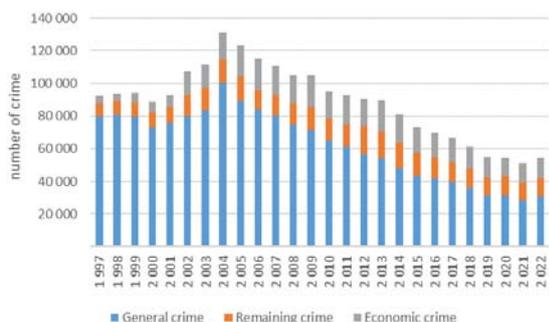


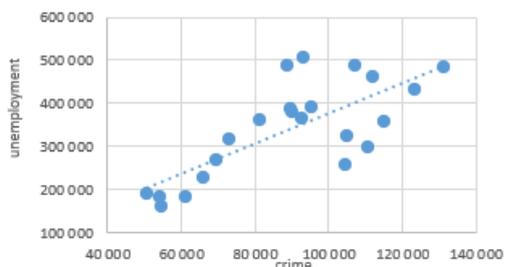
Figure 3. Development of crime in Slovakia during the period 1997-2022; source: Own processing according to the data from Ministry of Interior of the Slovak Republic, 2023

Looking at the long-term development of crime in Slovakia (Figure 3), it is possible to note a downward trend in this area since 2004. In that year, 131 244 crimes were committed in the country. Other years marked by the pandemic did not cause an increase in crime. The change occurred only in 2022, when the number of committed crimes reached the level of 2018 and 2019, which may be the result of too high inflation leading to a decrease in the real income of the population.

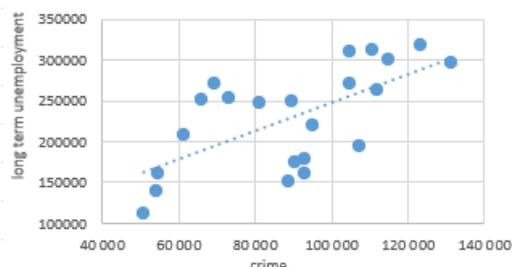
It is necessary to state that during the observed period there was a change in the structure of committed crimes. While in 2004, general crime accounted for 76.5 %, economic crime 12.5 % and remaining crime 11 %, by 2022 the importance of economic and remaining crime increased (more than 20 % share of total crime in both cases).

3.1 Impact unemployment and poverty on crime

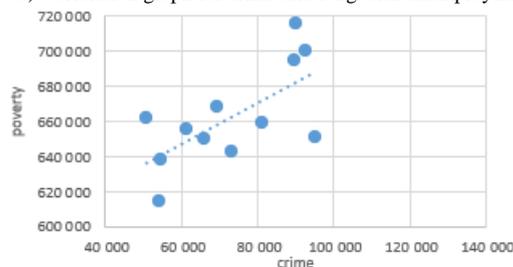
The purpose of a correlation graph is to provide a general illustration of the relationship between the two variables. Two variables have a positive association when above-average values of one tend to accompany above-average values of the other, and when below-average values also tend to occur together. This applies to all three graphs analyzed (Figure 4).



a) Correlation graph for crime and unemployment



b) Correlation graph for crime and long term unemployment



c) Correlation graph for crime and poverty

Figure 4 Correlation graphs

A positive correlation means that with an increase of unemployment and long term unemployment rate, dependent variable - crime increase (Figure a and b). It is the same with the relationship between crime and poverty, although the graph suggests that the intensity of the relationship is lower in this case (Figure 4c).

Table 1 Correlation matrix 1

	TCR	UNE	LUNE	POV
TCR	1			
UNE	0.9263***	1		
LUNE	0.9594***	0.9609***	1	
POV	0.6713**	0.6583**	0.6762**	1

* TCR (total crime); UNE (unemployment); LUNE (long term unemployment); POV (poverty)

While correlation graph display the strength, direction, and form of the relationship between two quantitative variables, by calculating the correlation coefficients, it is possible to quantify the strength of the links between the observed variables (Table 1). Very strong correlation was recorded in case of the relation between total crime and unemployment and also between total crime and long term unemployment.

3.2 Impact of education level of unemployed on crime

As part of our article, we also deal with the issue of the education of the unemployed as a risk factor for committing crime. The correlation analysis confirmed the general assumptions in the researched area. In the case of general criminality (Table 2), the relationship with the number of unemployed with no education or primary education and also with lower secondary education shows a high degree of correlation.

Table 2 Correlation matrix 2

	GCR	NEPE	LSE	CSE	HE
GCR	1				
NEPE	0.9335***	1			
LSE	0.8000***	0.8636***	1		
CSE	0.6366**	0.7185**	0.9566***	1	
HE	-0.5908*	-0.5695*	-0.3169	-0.0783	1

* GCR (general crime); NEPE (no education, primary education); LSE (lower secondary education); CSE (complete secondary education); HE (higher education)

The regression was used for verification of the statistical significance of the relationship between unemployed level of education and general and consequently, economic crime.

Equation for the general crime regression model:

$$GCR = 0.612404348NEPE + 0.342128067LSE - 0.45360398CSE + 0.082981241HE + 18.27921062$$

The F-test is used to check the appropriateness of the multiple regression analysis. Its P-value is $6.64E-08 < 0.05$, so multiple regression analysis is appropriate. The adjusted R Square is 0.862696, which means that 86.27% of the variation in the dependent variable is affected by the independent variables. From the given data, the greatest influence (ceteris paribus) on crime has no education, primary education factor, with a regression coefficient value of 0.612 (Table 3).

Table 3 Estimated parameters for regression model 1

R Square	0.888849					
Adjusted R Square	0.862696					
Standard Error	7.934817					
Observations	22					
F test	6.64E-08					
	<i>coeff</i>	<i>std err</i>	<i>t stat</i>	<i>p-value</i>	<i>lower</i>	<i>upper</i>
<i>Intercept</i>	18.279	14.633	1.249	0.229	-12.594	49.153
<i>NEPE</i>	0.612	0.212	2.882	0.010	0.164	1.061
<i>LSE</i>	0.342	0.250	1.366	0.190	-0.1863	0.871
<i>CSE</i>	-0.454	0.336	-1.3481	0.195	-1.164	0.256
<i>HE</i>	0.083	0.356	0.233	0.819	-0.669	0.835

The relationship between unemployed with no education of primary education and general criminality proved to be statistically significant.

In addition, we were also interested in the relationship between economic crime and the level of education of the unemployed. Based on the correlation analysis (Table 4), we observe only a weak correlation between economic crime and the unemployed with higher education. For other levels of education, the correlation coefficient is even lower.

Table 4 Correlation matrix 3

	<i>ECR</i>	<i>NEPE</i>	<i>LSE</i>	<i>CSE</i>	<i>HE</i>
<i>ECR</i>	1				
<i>NEPE</i>	0.1025	1			
<i>LSE</i>	-0.0370	0.8636***	1		
<i>CSE</i>	-0.0553	0.7185***	0.9566***	1	
<i>HE</i>	0.2371	-0.5695*	-0.3169	-0.0783	1

* *ECR* (economic crime); *NEPE* (no education, primary education); *LSE* (lower secondary education); *CSE* (complete secondary education); *HE* (higher education)

However, the regression model also confirms the existence of a relationship between the crime indicator and the unemployed with higher education.

Equation for the economic crime regression model:

$$ECR = 0.153465 NEPE + 0.047634 LSE - 0.14886 CSE + 0.385893HE + 5.02192$$

Table 5 Estimated parameters for regression model 2

R Square	0.38081					
Adjusted R Square	0.235118					
Standard Error	3.137322					
Observations	22					
F test	0.072036					
	<i>coeff</i>	<i>std err</i>	<i>t stat</i>	<i>p-value</i>	<i>lower</i>	<i>upper</i>
<i>Intercept</i>	5.022	5.786	0.868	0.398	-7.185	17.229
<i>NEPE</i>	0.153	0.084	1.827	0.085	-0.024	0.331
<i>LSE</i>	0.048	0.099	0.481	0.637	-0.161	0.257
<i>CSE</i>	-0.149	0.133	-1.119	0.279	-0.430	0.132
<i>HE</i>	0.386	0.141	2.740	0.014	0.089	0.683

We decided to include the mentioned model in the study despite the fact that the F-test results indicate that it is not statistically significant (Table 5). However, p-value of individual regression coefficient for unemployed with higher education points out in its statistical significance.

4 Conclusion

Crime rate is influenced by many factors in individual countries. Poverty level, unemployment, strict police enforcement, severe sentences, age of income level belong among the frequently investigated impact factors. The current state of the Slovak economy is influenced by a inflation, impacts of pandemic and also war conflict in Ukraine and energy crisis. The impact of these phenomena was reflected in the development of unemployment and poverty indicators. In case of unemployment, there was a significant year-on-year increase in the number of unemployed and long-term unemployed (the period of 2019 and 2020) caused by pandemic.

Currently, due to high inflation, the population strongly felt the drop in real wages, which brought many households closer to the poverty line. It resulted in the highest number of people living below the poverty line (13.7% of the population) in Slovakia. Several residents face even existential problems that change their behavior, which in the worst case can result in committing criminal activity.

Correlation analysis confirmed a very strong relationship between crime and unemployment, while the value of the correlation coefficient was even higher in the case of long-term unemployment. These results are consistent with many studies, such as Jawadi et al. 2021; Armin, 2019; Shah, Soomro, Mirjat, 2019; Nordina, Almena, 2017; Fadaei-Tehrani, Green, 2002.

For a better assessment of the impact of unemployment on crime, we expanded the analysis to include the factor of education of the unemployed. The lack of education makes it difficult for low-income people to meet their needs. This was also confirmed by the results we achieved. The relationship between unemployed with no education or primary education and general criminality proved to be statistically significant. The second regression model indicated the relationship between economic crime and individual levels of education of the unemployed, specifically in the case of the unemployed with higher education.

In the article, we focused on the investigation of the relationship between crime, unemployment and poverty, thus fulfilling its aim. For further research, it is possible to expand the selection of considered factors, e.g. about income indicators, living standard or welfare.

Literature:

1. Abdila, A. A. et al.: The Effect of Unemployment and Poverty on Criminality in East Java Province in Supporting State Defense. In: *Journal of Research in Business, Economics, and Education*, 2022, 4(4), 13-19.
2. Armin, F.: Analysis of the Effects of Education, Unemployment, Poverty, and Income Inequality on Crime in Indonesia. In: *4th Padang International Conference on Education, Economics, Business and Accounting (PICEEBA-2 2019)*, Atlantis Press, 2020. p. 368-374.
3. Badzaghua, M. & Gondauri, D.: Criminality and Socio-Economic Status Correlation Determinants. In: *Bulletin of the Georgian National Academy Of Sciences*, 2021, 15(3), 133-138.
4. Buonanno, P. et al.: Poor institutions, rich mines: Resource curse in the origins of the sicilian mafia. In: *Economic Journal*, 2015, 125.586: F175-F202.
5. Eurostat. [online]. [cit. 2023-05-17]. Available at: <https://ec.europa.eu/eurostat/>
6. Evans, J. D.: *Straightforward statistics for the behavioral sciences*. Pacific Grove, CA: Brooks/Cole Publishing, 1996.
7. Fadaei-Tehrani, R. & Green, T.M.: Crime and society. In: *International Journal of Social Economics*, 2002, 29(10), 781-795.
8. Huang, J., van den Brink, H. M. & Groot, W.: A meta-analysis of the effect of education on social capital. In: *Economics of education review*, 2009, 28(4), 454-464.

9. Imran, M., Hosen, M. & Chowdhury, M.A.F.: Does poverty lead to crime? Evidence from the United States of America. In: *International Journal of Social Economics*, 2018, 45(10), 1424-1438.
10. Jawadi, F. et al: Does higher unemployment lead to greater criminality? Revisiting the debate over the business cycle. In: *Journal of Economic Behavior & Organization*, 2021, 182, 448-471.
11. Kooli, Ch.: Perspectives of social policies and programs in the post-Covid-19 era. In: *Avicenna*, 2022, 1, 1-3.
12. Kuchta, J., et al: *Základy kriminologie a trestní politiky*. Praha: C. H. Beck, 2005, 568.
13. Laliotis, I.: Crime and unemployment in Greece: Evidence before and during the crisis. In: *Economics and Business Letters*, 2016, 5(1), 10-16.
14. Larii, L., & David, M.: The influence of economic and socio-cultural factors on criminality. In: *Scientific Annals of the "Stefan Cel Mare" Academy of the Ministry of Internal Affairs of the Republic of Moldova/Revista Stiintifica a Academiei Stefan Cel Mare*, 2019, 1, 97-103.
15. Ministry of Interior of the Slovak Republic. [online]. [cit. 2023-05-19]. Available at: <https://www.minv.sk/?ministry-of-interior>
16. Mirjat, N. H. et al.: A review of energy and power planning and policies of Pakistan. In: *Renewable and Sustainable Energy Reviews*, 2017, 79, 110-127.
17. Mokline, A.: Criminality, Human Capital and Economic Performance. In: *Business and Economic Research*, 2018, 8(4), 130-142.
18. Nordin, M. & Almén, D.: Long-term unemployment and violent crime. In: *Empirical Economics*, 2017, 52, 1-29.
19. Polák, P.: Vývoj a charakteristika ekonomickej kriminality v Slovenskej republike. In: *Nové jevy v ekonomickej kriminalite: sborník príspevků z mezinárodní konference*. Brno: Masarykova univerzita, 2020, 9-25.
20. Shah, N., Soomro, B.A. & Mirjat, A.J.: An Investigation of the Impact of Poverty and Unemployment on Criminal Behaviour among Youths: An Empirical Approach. In: *Pakistan Journal of Criminology*, 2019, 11(1), 54-67.
21. Statistical Office of the Slovak Republic. [online]. [cit. 2023-05-10]. Available at: <https://slovak.statistics.sk/>
22. World Population Review: *Crime Rate by Country 2023*. [online]. [cit. 2023-06-22]. Available at: <https://worldpopulationreview.com/country-rankings/crime-rate-by-country>
23. Želinský, T.: Subjective well-being, income, and ethnicity in Slovakia. In: *Journal of Poverty*, 2022, 26(4), 271-296.

Primary Paper Section: A

Secondary Paper Section: AH