EMPLOYMENT DEVELOPMENT IN THE CONTEXT OF AGENDA 2030

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Abstract

The aim of our scientific study was to identify and assess the specificities of the EU countries in the field of employment improvement based on the indicators "young people neither in employment nor in education and training" (NEET) and "employment rate" within the EU and to evaluate the position of the Slovak Republic. The selected indicators are determined in Agenda 2030 in the area of "Decent work and economic growth" as indicators with quantitative targets. In the scientific study, the method of analysis of the development of time series and linear regression analysis is used. We can say that the development in the Slovak Republic is favourable. However, the values of both indicators are worse than the average values in the EU. The linear regression points to a strong connection between indicators. From the derived relations, the possibilities for improvement also follow.

Key words:
Agenda 2030, employment rate, young people neither in employment nor in education, linear regression, time series

INTRODUCTION

All the developed countries of the world are currently engaged in a sustainable development strategy. Sustainable development is seen as a necessity and an important competitive advantage towards prosperity. It is important to ensure sustainable development in the economic, social, environmental and institutional spheres. In the economic sphere, the focus is on developing the economic potential of the country, mainly on economic growth and increasing competitiveness. In the social sphere, the focus is on human resources and improving their quality. In the environmental sphere, the focus is on the protection of the country's natural resources and natural potential. In the institutional sphere, it addresses the quality of local and regional governments and the quality of their institutions (Huttmanová, 2011).

The sustainable development strategy is formulated in Agenda 2030, which is the 2030 agenda for sustainable development. Its implementation will lead to progress and convergence of national economies. It will reduce regional disparities at national levels and accelerate change. "The key principles of the 2030 Agenda, as set out in the document endorsed by the UN General Assembly in September 2015 - "Transforming our world: the

2030 Agenda for Sustainable Development "1 , are transformation, integration and universality (Kubišová, 2021). The 2030 Agenda contains 17 sustainable development goals focusing on three areas - economic, social and environmental. These goals thus address the most important challenges of today, with a focus on enhancing progress in the future. The Sustainable Development Agenda has an important place in setting national priorities and their implementation. It therefore becomes important to monitor and assess progress towards each goal at European and national levels (Statistical Office of the Slovak Republic, 2023).

Sustainable progress under the 2030 Agenda is tracked under goal 8 "Decent work and economic growth" on the basis of I. sustainable economic growth, II. employment, III. decent work. In our scientific study, we will assess the development of the SR and evaluate progress towards the employment goals. We will focus on indicators with quantitative goals. There are two indicators set: "young people neither in employment nor in education and training" (NEET) and „employment rate". For these indicators, thresholds are set for countries to achieve by 2030. For the indicator "NEET of population aged 15 to 29", the value that needs to be achieved has been set to less than or equal

to 9%. Thus, the threshold set is 9%. For the indicator "employment rate of population aged 20 to 64", the value that needs to be achieved has been set to greater than or equal to 78% (Eurostat, 2, 2023).

States currently vary considerably in the values of these indicators. Hence, they have to exert varying degrees of effort to achieve the set thresholds.

Various concepts are applied to achieve the goals. One of the best known concepts is the concept of smart regions. Its main idea is the use of digital information and communication technologies to raise the standard of living in the regions. One of the aspects of the smart approach is the support of innovations and the creation of new jobs with the aim of increasing employment (Pauhofová, Staněk, Stehlíková, 2019).

LITERATURE OVERVIEW

Sustainable development is understood as development that takes into account and respects present needs without limiting future generations (Dubravská, 2017). This means that it not only focuses on the short term, but also takes into account the needs in different areas of the next generations in the long term.

Sustainable development of a country is only possible with the development of human resources. Increasing employment is considered as one of the most important pillars of human resource development. It has an impact on poverty eradication and reduction of social and regional inequalities (Lee, Christianson, Bietsch, 2016). On the contrary, when unemployment increases, social exclusion as well as poverty and misery increase. Ultimately, employment and unemployment affect a country's economic development and its competitiveness.

Employment is affected by several factors. The current population trend, where the share of people of post-working age is decreasing and there is a shortage of labour in the labour market, has a positive impact on increasing employment. However, it is not the only way to achieve the desired employment rates. Sophisticated and complex job creation is becoming an important political and economic objective.

In terms of unemployment, there are significant differences depending on age. Young people are among the most vulnerable groups. The importance of employment of young people is important from a number of perspectives and can be understood broadly. It is not only linked to the economic sphere, but also affects the social and migration spheres. Unemployment of young people directly increases the risk of social dissatisfaction (Escudero, Mourelo, 2014). Young people, in particular, lose their work habits and interest in looking for a job very quickly. Unemployment of young people has an impact on long-term social exclusion in old age and increases the risk of poverty. In the long term, this is particularly the case for men (Bäckman, Nilsson, 2016). The negative consequence can then be that young people leave both the labour market and their home country.

The values of the indicator "young people neither in employment nor in education and training" are sensitive to negative changes in the environment. Some authors point to the fact that during the COVID 19 pandemic the values of this indicator deteriorated. The most affected were young people after college in the age group of 25 to 34 years (Aina, Brunet, Mussida, Scicchitano, 2021).

There are several reasons why young people are neither in education nor in work. Some authors point to the fact that the high share of "young people neither in employment nor in education and training" may not indicate a lack of interest among young people in employment but is a consequence of young people not being able to find work in the long term (Mudiriza, Lannoy, 2023). One reason for this may be that employers often demand work experience that young people do not have. This may also be one of the reasons why countries with a higher share of students working alongside their studies have lower values of the indicator "young people neither in employment nor in education and training". Engaging young people in the labour market while they are still studying and linking education to work experience appears to be an important tool for reducing the values of this indicator.

Creating job opportunities for young people also appears to be important. Equally important is to make young people's opportunities for entrepreneurship (Esha, 2020) more functional and systematic. Such an approach can benefit

from the creativity of young people. However, some authors take a different view. They point out that promoting entrepreneurship as a development strategy has not proven successful. It is the policy strategies favouring such approaches that should be one of the most important (Cieslik, Barford, Vira, 2022).

In monitoring the results so far in meeting the goals set out in Agenda 2030, some authors draw attention to large regional disparities. In the area of sustainability, the Nordic countries perform best in the economic and social spheres. Their past development has been favourable over the long term and they therefore perform positively on most economic and social indicators. In contrast, the countries of Eastern Europe and those that joined the EU after 2004 are largely lagging behind the others, especially in the economic and social areas. (Ricciolini, Tiralti, Paolotti,Rocchi, Boggia, 2023). They need to make much greater efforts to achieve the set goals.

At the same time, it is necessary that these countries make more intensive use of information and communication technologies, which is an important aspect of the Smart approach. It also includes more effective investment in the development of human and social capital (SBA, 2021).

GOAL AND METHODOLOGY

Our scientific study focuses on the assessment of "young people neither in employment nor in education and training" (NEET) and "employment rate" in the Slovak Republic within the EU. The aim of our scientific study is to identify and assess the specificities of the EU countries in the field of employment improvement based on the indicators "young people neither in employment nor in education and training" and "employment rate" within the EU and to evaluate the position of the Slovak Republic. The selected indicators are determined in Agenda 2030 in the area of "Decent work and economic growth" as indicators with quantitative targets.

The following research questions are projected:
1/ What is the development of the indicator "young people neither in employment nor in education and training" in the SR within the EU?

2/ What is the development of the indicator "employment rate" in the SR within the EU?
3/ What is the relationship between the values of both indicators in the SR?

In addition to analysing the status quo, we also look at the dynamics of change. For the analysis of the time series development we use the coefficient of growth (decline). The average growth (decline) coefficient is expressed by the geometric mean according to equation (1)

$$\bar{k} = \sqrt[T-1]{k_2 k_3 \dots k_T} = \sqrt[T-1]{\frac{y_2}{y_1} \frac{y_3}{y_2} \dots \frac{y_T}{y_{T-1}}} = \sqrt[T-1]{\frac{y_T}{y_1}}.$$

(1)   (Pacáková, 2003, 244)

y_i indicates the value of indicator in the ith analyzed period.

The period analysed is the years 2004 to 2022. This period has been determined on the basis of data availability. The data source was the Eurostat database. The data were analysed using Microsoft Excel and Gretl.

An important step to find out the correlations between the two variables is to determine the regression relationship. We used the OLS method to express the linear relationship between the two variables.
The shape of the model was:
$$v_{2t} = f(v_{1t}) + \epsilon_t$$
(2)
where ϵ_t represents the random component - the component of residuals and applies $\epsilon_t \sim N(0, \sigma_0^2)$

The functional relationship was:
$$v_{2t} = \beta_0 + \beta_1 v_{1t}, t = 1, 2, \dots, T,$$
(3)

We verified the statistical significance of the parameters and the model.
Null hypothesis -   1H0: the parameter is not statistically significant.
Alternative hypothesis - 1H1: the parameter is statistically significant.

Null hypothesis -   2H0: the model is not statistically significant.
Alternative hypothesis - 2H1: the model is statistically significant.
We used the t-test to verify the statistical significance of the parameters. We used the F

test to test the statistical significance of the model (Adamec, Střelec, Hampel, 2017).

To evaluate the model, we expressed the statistical measure - coefficient of determination (R-squared). R-squared shows the proportion of variation in a dependent variable explained by an independent variable.

We verified the normality of the residuals and determined whether autocorrelation does not occur.

Null hypothesis - 3H0: error is normally distributed.
Alternative hypothesis - 3H1: error is not normally distributed.
(Adamec, Střelec, 2020).

Null hypothesis - 4H0: first-order autocorrelation does not occur (no autocorrelation).
Alternative hypothesis - 4H1: first-order autocorrelation does occur.

Since these are time series, it is important to check whether the time series are stationary. In case of non-stationarity of time series, their

cointegration is important. If the non-stationary time series are not cointegrated, it can occur spurious regression (Arlt, 1997).

We used the ADF test to verify stationarity. This is a test whose null hypothesis speaks of non-stationarity in the form of unit root(s) (Výrost, Baumöhl, Lyócsa, 2013, 262).

FINDINGS

1. Evaluation of the status and the development of selected indicators

1.1 Young people neither in employment nor in education and training

In 2004, NEET values were published for 24 states. Unpublished data concerned Malta, Croatia and Italy. Six states had NEET values less than 9%, namely Denmark, Luxembourg, Netherland, Austria, Slovenia and Sweden. The lowest value was for Luxembourg (5.4%). Bulgaria had the highest value with 28.7%. The EU average was 13.48%. Slovakia had the third highest value - 21.2% (Fig. 1). The high share of "young people neither in employment nor in education and training" is one of the weaknesses of Slovakia.

Fig.1: Young people neither in employment nor in education and training NEET in the year 2004
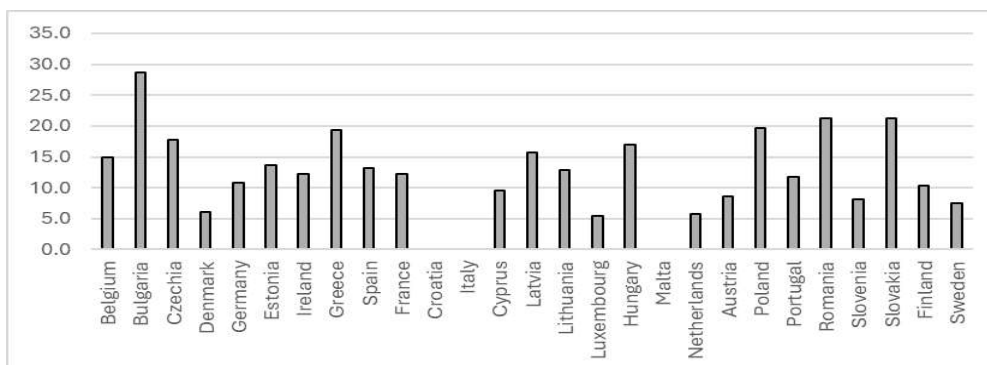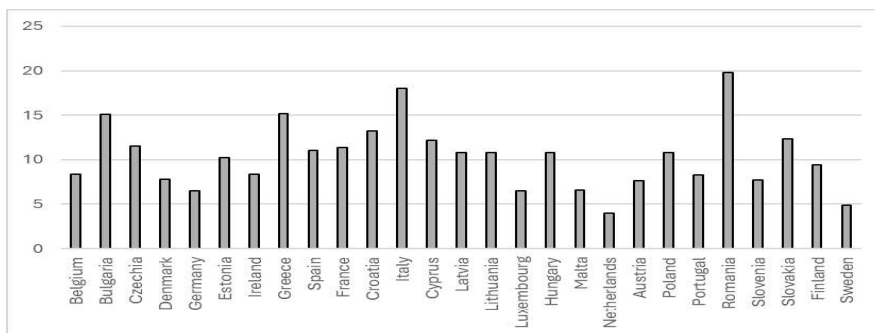

Source: Eurostat. (1, 2023)

By 2022, the value of the NEET indicator decreased significantly in most EU countries. 11 countries already had a value of less than 9% (Fig. 2). The Netherlands had the lowest value - 4%. The value of the indicator in Slovakia had decreased to 58% since the beginning of the period analysed (Fig. 3) and reached a value of 12.3%. The average decline coefficient

expressed by the geometric mean was 2.98%. The decrease in the value of the indicator for Slovakia was significant. Thus, Slovakia is among the EU countries in which the value of the indicator is above the threshold of 9% at the beginning as well as at the end of the period analysed, but a significant decrease in the indicator values has been recorded. The

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Netherlands and Sweden can be considered as the best performing countries. In both years they had values of the indicator below 9% and their values decreased significantly over the period analysed.

Fig.2: Young people neither in employment nor in education and training NEET in the year 2023
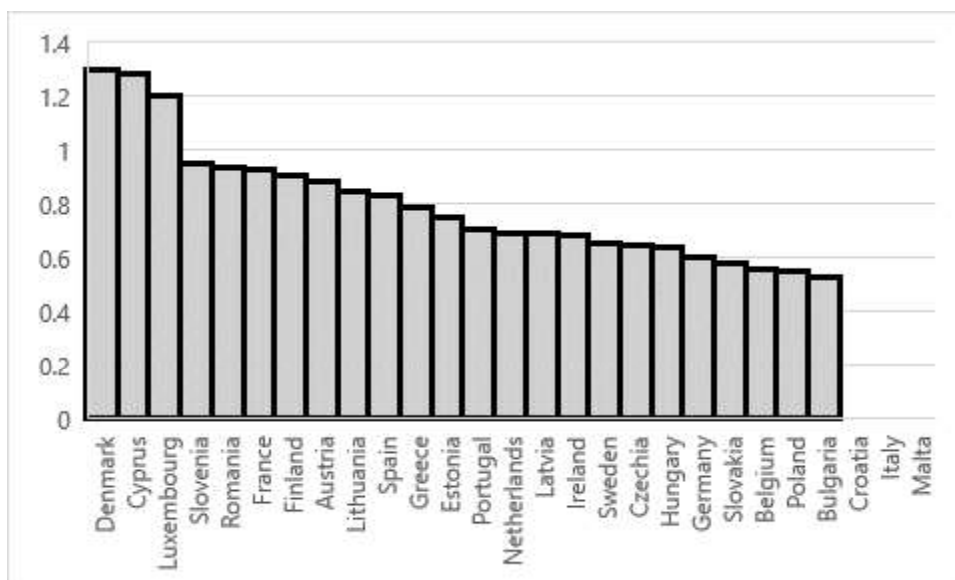

Source: Eurostat. (1, 2023)

The unfavourable development occurred in Cyprus. The indicator values were above 9% at the beginning as well as at the end of the period and increased significantly.

In summary, we can say that the development of the NEET indicator in the Slovak Republic is favourable. However, in terms of the EU, the value of the NEET indicator is still above the EU average and is the seventh highest (Fig. 2). It is important that the positive trend of decreasing values of the indicator in the Slovak Republic continues in the following period.

Fig.3: Coefficient of growth (NEET)

Source: Eurostat. (1, 2023)

1.2 Employment rate

In 2004, "employment rate" values were published for 24 countries. Data were not published for Croatia, Italy and Malta. Only Denmark and Sweden had employment rates greater than 78%. Denmark had the highest value - 79.9%. Poland had the lowest value - 57%. The EU average was 68.9%. Slovakia was well below the EU average with a value of 63.5% (Fig. 4). The below-average value of the employment rate is one of the weaknesses of the Slovak Republic.

Fig.4: Employment rate in the year 2004
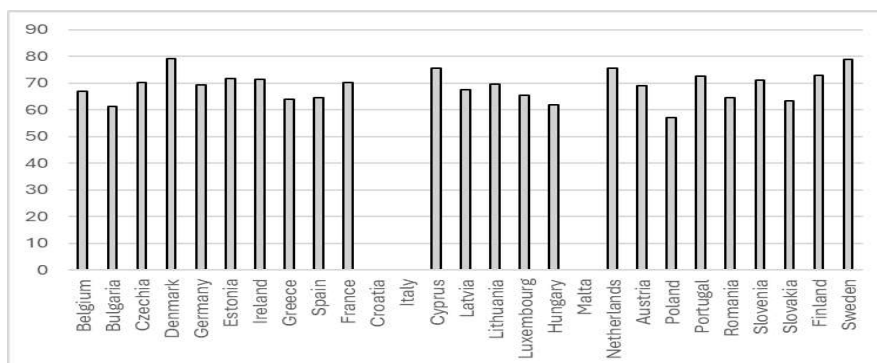
Source: Eurostat. (3, 2023)

By 2022, the value of the employment rate increased significantly in all EU countries (Fig. 5). By the end of the period analysed, 12 countries already had a value greater than or equal to 78%. Sweden had the highest value 83.8%. The value of the indicator in Slovakia had increased to 120.79% since the beginning of the period analysed (Fig. 6) and reached the value of 76.7%. The average growth coefficient expressed by the geometric mean was 1.05%.

The value of the indicator in Slovakia was already at the level of the EU average. The increase in the value of the indicator within Slovakia was significant. It was the fourth highest increase in the value of the indicator within the EU. Nevertheless, Slovakia failed to reach the employment rate threshold of 78% by 2022. A significant increase occurred in Poland. The value of the indicator increased by up to 34.6% in the period analysed.

Fig.5: Employment rate in the year 2022
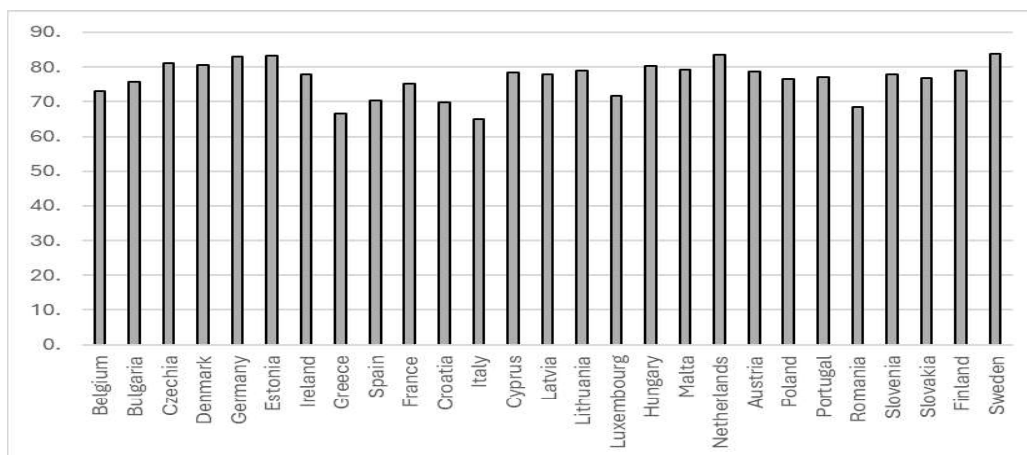
Source: Eurostat. (3, 2023)

In summary, we can say that the development in the Slovak Republic is favourable. However, in terms of the EU, the value of the indicator does not yet reach the required value. It is important that the positive trend of increasing employment rate values in the Slovak Republic continues in the following period.

Fig.6: Coefficient of growth (Employment rate)
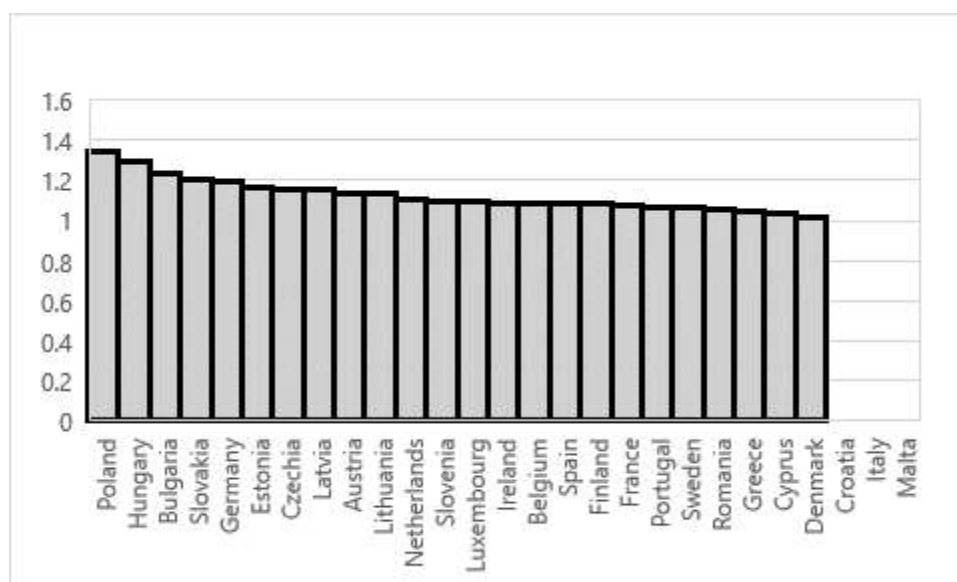
Source: Eurostat. (3, 2023)

2. Evaluation of the specifics of Slovakia

In order to assess the values of the indicators in the Slovak Republic, it is important to observe the regression relationship between the two variables analysed.

The dependent variable v_{2t} is NEET. The independent variable v_{1t} is the employment rate. Based on the OLS method, we can derive the functional relationship between the variables.

Since we are analysing the relationship between the values of two time series, we will first look at their stationarity. Based on the Unit root test in Gretl, we did not reject the null hypothesis that the time series are non-stationary. Thus, we did not accept the alternative hypothesis that the time series are stationary.

"One way to possibly avoid the problem of false regression is to transform non-stationary time series into stationary ones." (Výrost, Baumöhl, Lyócsa, 2013, 277). One possibility is to transform the variables using differential. "It is recommended to first take the logarithm of the values before differencing" (Výrost, Baumöhl, Lyócsa, 2013, 278).

Therefore, we assume the following functional relationship:

$$d\ln v_{2t} = \beta_1\, d\ln v_{1t} + \beta_0,\quad t=1,\ 2,\ ...,\ T, \quad (4)$$

where d is first difference, ln is the logarithm of the value.

Fig.7: Linear regression
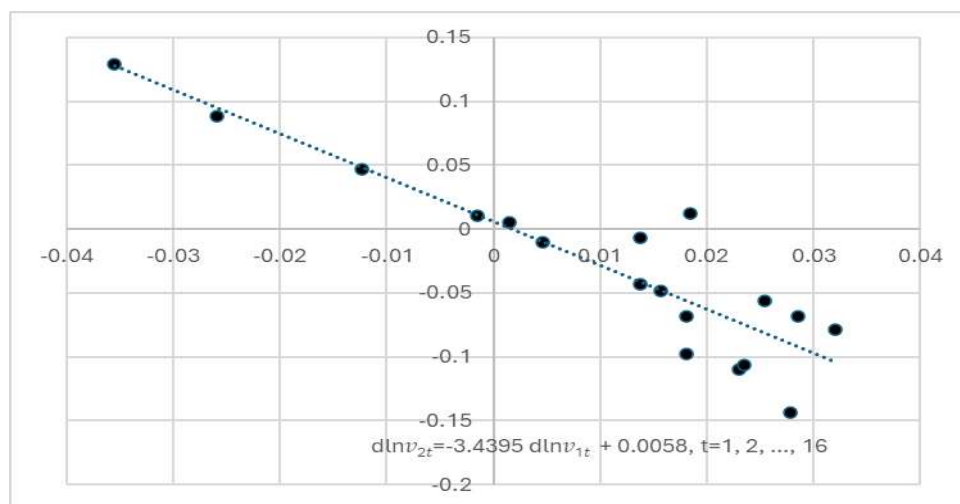
Source: own processing based on data from Eurostat (1, 3, 2023) in Microsoft Excel

Using the OLS method, we derived the following relationship:

$dln v_{2t}$=-3.4395 $dln v_{1t}$ + 0.0058, t=1, 2, ..., 18,

where *d* is first difference, *ln* is the logarithm of the value.

The linear dependence is indirect (Fig. 7). Based on the adjusted R-squared, we can conclude that 81.55% of the variability is explained by the model. Both the regression coefficient and the model are statistically significant (p less than 0.01).

We used the Chi-square test to verify the normality of the residuals. We did not reject the null hypothesis: error is normally distributed. We did not reject the null hypothesis: no autocorrelation based on the LM test for autocorrelation.

It follows from the previous analysis that if the current development is maintained and the average growth (decline) coefficient does not change, then it is realistic to reach the set limit of the employment rate. However, the cutoff for NEET would not be reached.

Expressing the parameters of linear regression is of practical importance. It points to a very strong connection between both indicators. The increase in the growth of the employment rate also resulted in a significant decrease in NEET.

This finding is important. It points to the need to find all the possibilities for a more significant increase in employment in the Slovak Republic. More intensive application of the concept of Smart approaches and the building of Smart regions is becoming a necessary. The above relationship implies the need for increasing employment growth. The SR should use all the means available to increase employment. This is the only way to ensure economic and social development.

DISCUSSION

It is necessary to constantly monitor the indicators used within the 2030 Agenda and, based on the ongoing results achieved, adjust the sub-goals during the analyzed period. Based on our analysis, we can agree with the evaluations of the Agenda 2030, in the report on the results achieved in the national priorities of the implementation of the Agenda 2030, which note the improvement of employment in the Slovak Republic (Ministry of Investments, Regional Development and Informatization of the Slovak Republic, 2020). For both analyzed indicators, the improvement of the Slovak Republic's position in the EU area was confirmed. At the same time, however, we want to draw attention to the need to increase the intensity of employment improvement, which results from

the current development. By intensifying the improvement of employment can it be possible to achieve both goals set in Agenda 2030.

CONCLUSION

The scientific study focuses on employment in the Slovak Republic from the point of view of the 2030 Agenda. It analyses the position of the Slovak Republic in the EU space and, based on current developments, it aims to evaluate the reality of achieving both quantitative goals of the indicators.

The aim of our scientific study was to identify and assess the specificities of the EU countries in the field of employment sustainability based on the indicators "young people neither in employment nor in education and training" and "employment rate" within the EU and to evaluate the position of the Slovak Republic.

Based on the analysis, we can summarize that the values of both indicators in the Slovak Republic were worse than the average values within the EU. So we can evaluate them as weak points of Slovakia. On the other hand, it should be noted that the trends of both indicators in Slovakia are favorable. Their value improved and approached the values of developed EU states.

The linear regression points to a very strong connection between indicators "young people neither in employment nor in education and training" and "employment rate". The increase in the growth of the employment rate also resulted in a significant decrease in NEET. Therefore, the solution to significant reductions in NEET, which the Slovak Republic needs, is an increase in the rate of growth of the employment rate.

This finding is important. It points to the need to find all the possibilities for a more significant increase in employment in the Slovak Republic. More intensive application of the concept of Smart approaches and the building of Smart regions is becoming a necessary. To increase employment in the Slovak Republic, it is necessary to use all available means, including more intensive enforcement of the concept of Smart regions.

Acknowledgments

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