CHANGES AND TRENDS IN THE EMPLOYMENT STATUS OF UNIVERSITY GRADUATES IN BULGARIA AND THE EU

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Abstract:
This research focuses on the ongoing changes and the new challenges faced by labor in the process of transition to a new type of economy. It is structured in two parts. The first part systematizes the main changes in the characteristics and requirements to labor in the context of the formation of a new economy and the transition to a digital one. The second part makes an empirical analysis and draws up the specific aspects in the dynamics of the indicators of the employment status of university graduates in Bulgaria and the EU which are relevant to the latest changes in the increasing implementation of more complicated mental labor. By applying methods of forecasting, the author brings forward certain short-term trends in the fluctuations of the relative ratio of the employed persons with a university degree in Bulgaria and the EU. The research implements the methods of analysis and synthesis, the means and methods of empirical-descriptive, as well as the econometric analysis.

Key words: economy of knowledge, labor, employment.
JEL: O1, J00, J21.

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1. Introduction

Over the last few decades, there have been significant changes in the type of economy, in its leading industries and divisions, in the introduced and more widely used techniques and technologies. Parallel to this, the functions, place and role of the employee in production activities have changed as well. The intensified transition from economy of (material) production to economy of services and the wider implementation of more complicated techniques and information technologies have increasingly reduced the necessity of physical labor. In the meantime, the creation and implementation of new techniques and technologies necessitate the investment in more mental and intellectual labor, higher degree of qualification, more diverse knowledge and skills demonstrated by employed persons. These processes have a gradual reflection and cause certain changes in the structural indicators of both employment and unemployment.

In the context of those interwoven changes throughout the last years, we shall draw up the objective and tasks of this research, which shall focus on:

- systematizing the major changes in the characteristics and requirements to labor in the conditions of new economy and its transition to digital economy;

- studying and drawing up the specific aspects in the indicators of employment of university graduates in Bulgaria and the EU as being relevant to the latest changes in the increased implementtation of more complicated mental labor;

- bringing forward through the application of methods of forecasting certain short-term trends in the changes of the relative ratio of the employed persons with a university degree in Bulgaria and the EU as a whole.

The research has been carried out by implementing the methods of analysis and synthesis, the means and methods of empirical-descriptive as well as econometric analysis.

2. New trends and challenges faced by labor in the new economic conditions

Since the beginning of the 21st century, the development of labor has been going through an entirely new stage, the transition to which is relevant to the economy and society driven by fast-developing technologies. The changes are directly related to the formation of the so called "industry 4.0" which is based on robotization and artificial intelligence, on big data, genomics, cloud technologies, recycling technologies and renewable energy, digital platform

and digital currencies, etc. (Prodanov, Hr., 2017; Danailov, 2016). This has provided M. Schmidt with the ground to define and outline the role of "labor 4.0", relating it to the concept of the development and acceleration of the transition to digital economy or economy of platforms (Schmidt, M., 2017). He emphasizes that the characteristics of this other, latest type of economy will have an impact and will cause effects on employment due to the ongoing structural changes in the economy and the transformation of the aims and objectives of employed persons. In the conditions of the development and the introduction of digital technologies, the transformation of the so called "big data" into a key resource of the digital economy and in the process of the development of industry 4.0, new markets and new types of labor will develop, which will bring the necessity of new interaction "human-machine"; a transition to a more flexible work hours and work places will be made, in other words these will be "beyond the presence of man". Schmidt also includes in his generalizations the possibilities and gradually occurring changes in business enterprises, which he relates to the process of disin-tegration of traditional structures which has already commenced and which he expects to accelerate, as the conclusion that he makes is that "employment forecasts indicate little general effect of digitalization, but massive structural change" (Schmidt M., 2017).

The development of ICT and the introduction of artificial intelligence will result in a tangible restriction of the possibilities for direct participation of man in economic activities, which respectively will reflect the processes of demand and supply of labor, as well as the parameters of employment and unemployment. As a result, this will limit the range of activities which can be done and provide sufficient opportunities for people without the necessary qualification to seek employment. Since the second half of the 20th century, when the concepts of "postindustrial society" (Bell, 1999) and "economy of knowledge" (Drucker, P., 1969) were coined (concepts which emphasize on science, information and knowledge as defining for the capacity and development of the economy and the society), there has been an upward trend in the mental application of labor[2]. We have been witnessing an increasing

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[2] The confirmation of those concepts is followed by the development of new concepts based on the leading significance of knowledge, information and the development of new technologies as: "new industrial society" (J. Galbraith), "information society" (M. Castells), "digital economy" (D. Tapscott), "network society" (M. Castells), "third wave" (A. Toffler), etc. See: Bell, Daniel, The Coming of Post-industrial Society, M., published by Academia, 1999; Tapscott, D., Digital Capital. Harnessing the Power of Business Webs, Abagar, S., 2001; Tapscott, D., A. D. Williams, Wikinomics, Best Business Books, 2009; Drucker, P., The Age of Discontinuity, London: Heinemann, 1969; Castells, M., The Rise of the Network Society, S., 2004; Toffler, A., The Third Wave, published by Peyo Yavorov Publishing, Sofia, 1991; Deming, W., The New Economics for Industry, Government, Education, Investpress AD, Sofia, 2014; *etc*.

demand of a new type of labor, of the acquisition of diverse knowledge and skills by which we shall utilize to a greater extent the possibilities of the expanding access to a multitude of information sources, to the acquisition and expression of a high-quality creativity and adaptiveness, high digital culture, capabilities for interaction with robotized sources of labor. The increase of the relative ratio of the implemented complex labor has led to an increase of the necessity of higher qualification of the employed persons; more and more often, the performance of complex labor functions even requires employees with several qualifications, knowledge and skills for performing multiple, interrelated and complementing operations and tasks (Zareva, 2000). Routine labor is gradually being replaced by creative labor – it involves to a larger extent man's intellect, his/her capabilities for finding new solutions in the field where his/her labor is to be applied (Damyanov, Marinova, 2011; Andreev, 2017; Rasskazova, Kalinina, Zotova, 2018). Although after certain time the routinization of labor might renew – then the new techniques and technologies become more widespread and prevailing, while the human's activities of control and management are mastered to a higher level and are gradually transformed to monotonous and routine ones.

A number of scientific analyses, as well as research carried out by renown institutions such as the World Economic Forum (WEF. The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution, 2016), the European Economic and Social Committee, the Republic of Bulgaria Economic and Social Council ("The Future of Labor: Challenges of the Fourth Industrial Revolution, the Republic of Bulgaria Economic and Social Council, Opinion, 2018) etc., present and summarize significant challenges in the field of labor. Among them we find: "insufficient and inappropriate qualification of workers and employees; new fields and commercial practices which require regulations; risk of loss of vacancies without replacement, more particularly those requiring low qualification; lack of relevant skills for accelerating the transition to the Fourth industrial revolution, as well as danger of developing high degree and permanent structural unemployment." ("The Future of Labor: Challenges of the Fourth Industrial Revolution, the Republic of Bulgaria Economic and Social Council, Opinion, 2018, p.3). At the same time, new possible benefits are brought out, for instance, "creating entirely new job positions, opening new sectors, products and services, digitalization, intelligent machine interface, new forms of integrated management and last but not least – sharp increase of the labor productivity ("The Future of Labor: Challenges of the Fourth Industrial Revolution, the Republic of Bulgaria Economic and Social Council, Opinion, 2018, p. 4). M. Schmidt also systematizes several major areas of tension in the field of "labor 4.0", but without separating the possible and expected positive and negative effects (Schmidt, M., 2017).

Several in-depth theoretical and empirical analyses developed over the last years, express the opinion and argue that the trends of specialists who change in order to respond to the needs of the practice are to continue to prevail. Evidence is presented and quite a few grounds are set forth that there is a high possibility in the near future for some of the old and established professions to lose significance, while others will disappear as they will be replaced by robotized sources of labor which will be more efficient, more productive and more resource-saving. However, new professions will appear, which will to a certain extent compensate the unfavorable trend which has been observed lately of firing workers with inappropriate to the new economic realities qualifications and knowledge. These new professions require an entirely new higher and adapted to the new conditions qualification. The new type of labor will be based on more knowledge, wide access to numerous sources of information, multidimensionality and interdisciplinarity, larger interrelation, flexibility, creativity and adaptiveness. The job description of the future employed persons will include high digital culture, higher education and skills, as well as well-developed capabilities for mastering, working and cooperating with the robotized sources of labor which are gradually replacing the old ones. The managers of the labor processes and the specialists who develop new technologies shall strive to facilitate the symbiose between robot and man aiming at increasing the efficiency of production, not at their mutual exclusion from the labor process. In this context, a number of studies have been carried out, for instance by P. Drucker, A. Toffler, D. Bell, J. Stiglitz, Ian Brinkley, M. Castells, S. Dyatlov, Cr. Codagnone, F. Abadie and F. Biagi, B. Frey and M. Osborne, D. Autor and D. Dorn, Michael Schmidt, Florian Schmidt, Ursula Huws[3], *etc*.

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[3] See: Codagnone Cr., F. Abadie, F. Biagi, The Future of Work in the 'Sharing Economy', European Commission, 2016, http://publications.jrc.ec.europa.eu/repository/ bitstream/JRC101280/jrc101280.pdf; Frey Carl Benedikt, M. A. Osborne, The Future of Employment: How Susceptible are Jobs to Computerisation?, Oxford Martin School, 2013, https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf; Autor D., D. Dorn, The Growth of Low-Skill Service Jobs and the Polarization of the U.S. Labor Market, American Economic Review, 2013, 103(5), pp. 1533-1597, https://www. ddorn.net/papers/Autor-Dorn-LowSkillServices-Polarization.pdf; Schmidt M., On Digital Economy and its Implications for Employment, Germany, Federal Ministry of Labour and Social Affairs, Jakarta 2017, https://www.fes-indonesia.org/fileadmin/user_upload/ events/2017/articles/Presentation_2017-04-26_Michael_Schmidt.pdf; Schmidt Fl. A., Digital Labour Markets in the Platform Economy, Friedrich-Ebert Stiftung, 2017, http://library. fes.de/pdf-files/wiso/13164.pdf; Huws U., The transformation of work in a global knowledge economy: towards a conceptual framework, 2005, http://www.ftu-namur.org/fichiers/ WORKS-Conceptual_framework.pdf; Jacobs J. C.,, H. Kagermann, D. Spath, The Future of Work in the Digital Transformation, 2018, https://www.acatech.de/wp-content/uploads/ 2018/03/acatech_DISKUSSION_HR-Kreis_engl_01.pdf, *etc*.

The upcoming and possible future changes in labor, the higher requirements set to the knowledge and skills of the labor force induce an expectation of adequate changes in the structural indicators of employment, primarily the employment of persons with primary and secondary education, on the one hand, and those with higher education, on the other.

3. **Trends and forecasts of the relative ratio of employed persons with higher education in Bulgaria and the EU**

3.1. **Trends in the relative ratio of employed persons with higher education in Bulgaria and the EU**

The presented changes which are related to the introduction of the fourth technological revolution and the transition to digital economy indicate about the introduction of additional changes to the characteristics and functions of labor as well as changes in the place and role of man in economic activities. In this respect, as it has already been pointed out, we observe an increased role of mental labor, which respectively leads to higher education, qualification and skills of the workforce. These conclusions have found theoretical and logical, as well as empirical expression and confirmation in the dynamic aspects of the major processes and indicators related to the characteristics and structural parameters of labor, employment and unemployment at this stage in Bulgaria and the European Union. We shall note that the degree of participation on the labor market along with the relative ratios in the total employment of people with low degrees and university degrees are significantly influenced by those processes.

The change in the relative ratio of employed persons with a university degree in Bulgaria for the period 2000–2017 is multifaceted (see table 1). In the years until 2007 this ratio fluctuates, although in a limited range; there are also years in which it remains unchanged. A clearer and relatively stable trend for its increase is developed after 2007–2008. There is only one exception of the increasing trend – in 2017, when the ratio of the employed persons with a university degree decreases by one percentage point. Therefore, throughout this period, as a whole, the ratio of those persons increases by 8.3 percentage points from 23.2% to 31.5% out of all employed persons.

Table 1

Relative ratio of employed persons with a university degree in Bulgaria aged 20–64 against the total number of employed persons (2000–2020)*

Year	Relative ratio of employed persons with a university degree in Bulgaria (%)	Relative ratio of employed persons with a university degree in the EU as a whole (%)**
2000	23.2	
2001	27	
2002	26.3	
2003	26.2	
2004	26.2	
2005	25.9	26
2006	25.7	26.3
2007	25.6	26.8
2008	25.7	27.5
2009	26.5	28.7
2010	27.4	29.7
2011	28	30.6
2012	28.6	31.6
2013	30.2	32.6
2014	31.7	33.3
2015	32.3	34
2016	32,5	34.6
2017	31.5	35.1

* Source: Author's own calculations based on data by Eurostat for the period 2000-2017: Employment by educational attainment level - annual data, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsi_educ_a&lang=en
** The Eurostat database presents data about the relative ratio of the employed persons in the EU as a whole starting from 2005.

A comparison of the data about Bulgaria and the EU as a whole shows that throughout this period the employed persons with a university degree are more as a ratio in the total employment on a European level. At that, in the EU we observe a continuous trend of increasing the ratio of employed persons with a university degree throughout the whole period 2005–2017. The changes, however, are relatively insignificant, as there are differences in the relative ratios of around one and in most cases under one percentage point.

This dynamics regarding Bulgaria (and partially the EU) may be said to be due to the effect of a totality of factors which is difficult to predict. Each of them may have an expanding but also shrinking impact on the number and the ratio of the employed persons with a university degree. This will be decided by the divisional specialization and trend towards the upcoming technical and technological breakthroughs and the speed at which they will be developed in Bulgaria, as well as the future parameters of other processes reflecting the total population, the number of people at working age, of those who study, of the employed and unemployed persons, etc. The most important factors for this are:

1) the present concentration of nearly half of the employed persons in Bulgaria in areas, industries and economic activities which require a higher level of education. Thus, for instance, as of 2017, 22.6% of the employed persons work in the field of processing industry. A total of over another 26% of the employed persons work in the fields of Administrative and Auxiliary activities, State administration, Education, Vocational activities and scientific research, Healthcare and social activities.[4] It is namely in those fields where we find the most favorable conditions for the introduction of technical and technological innovations from the point of view of their uniqueness, as well as bearing in mind the human capacity which has been accumulated in them. This means that on the one hand, these fields will demand more specialists with a university degree. On the other hand, however, this might have a shrinking effect on the employment of workers and specialists with a university degree as long as in the foreseeable future these fields will require to a larger extent the processes of robotization and digitalization.

2) The capabilities, notions, orientations and the planned investment projects of the existing and prospective entrepreneurs in Bulgaria towards certain types of traditional and modern industries. This might have a stimulating, but also slowing or negative impact on the opening of additional new vacancies requiring persons with a university degree.

3) Despite the decreasing population and, in particular, the number of children and young people due to demographic problems, the still intensive emigration for study or work and income abroad, and regardless of the fluctuations in each individual year, the number of students in Bulgaria currently has remained relatively constant. Therefore, we shall take into consideration the traditional interest by young people in Bulgaria in obtaining a higher educational degree. At the same time, the intensity of the emigration and demographic processes will determine to a certain extent whether the

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[4] Calculations based on latest data by the National Statistical Institute as of the end of January 2019.

number of students in the educational and qualification degree of "professional bachelor", "bachelor" and "master" and in the educational and scientific degree of "doctor" will be increasing or decreasing in the upcoming years. This will reflect the relative ratio of the employed persons with a lower and higher education in the future.

4) During the last reported by the National Statistical Institute 2016-2017 school year, the number of students from the 9th to the 13th grade in the secondary schools (129,023) amounts to 60% of the number of students at Bulgarian universities (respectively 215,259). As this share of secondary school students will be transformed into university students in the upcoming years, this will obviously have a negative impact on their number, which will indirectly reflect those employed in the higher education sector.

3.2. Forecasts for the relative ratio of employed persons with a university degree in Bulgaria and the EU

Through the prism of the outlined current trends and the possible multifaceted effects on them, it is of special interest to forecast more precisely the possible future trajectories of one of the main structural indicators related to the employment in Bulgaria and the EU in the short term by implementing econometric analysis. In this respect, a forecast has been made of the dynamics of the relative ratio of the employed persons with a university degree aged 20–64 as part of the total number of employed persons in Bulgaria and the EU for the period 2018–2020 (by implementing the statistical software IBM SPSS Statistics 21).

The choice of a forecast indicator is related to the pertinent necessity and prediction of a trend for the increased demand by enterprises, the development of new fields and industries which will provide opportunities for better employment of persons with predominantly higher level of education and qualification. The preferred age group is 20–64 and corresponds to the fact that the effects have an impact mostly on those young people who enter the labor market and their upcoming professional realization, but they will inevitably affect the older part of the persons of working age and employed persons.

As exit data for the forecast for Bulgaria we have used data by Eurostat for each individua year for the period 2000–2017 for the relative ratio of employed persons with a university degree in Bulgaria aged 20–64 against the total number of employed persons. The reasons to research such a long time period is due to the fact that the elements in the dynamic rows contain a random component; therefore, the assessment of the forecast values on the basis of shorter dynamic rows in some cases hides certain risks.

Working with longer dynamic rows allows outlining the permanent trend and on the basis of the development of the selected indicator in the past, we can make a more precise forecast of its future expression.

An analogous forecast has been made for the European Union as a whole but bearing in mind the limited availability of Eurostat data in the forecast for the relative ratio of the employed persons with a university degree in the EU, data about the period 2005–2017 has been applied. A comparison of the result of the two forecasts provides us with the opportunity to outline the differences or similarities in the spreading trends in Bulgaria and the EU.

The objective of the presented below forecasts is to outline the trend of development and to what extent it corresponds to the expectations of the analysts on the basis of the development as of that moment, not so much to predict in concrete values the percentage of those employed in the field of higher education. The fast pace of development of the technologies throughout the last years and the rapid changes that have an impact on the economy, hence on the labor market, along with the influence of factors in the opposite direction, make the size of employment in medium and long term difficult to justify. For this reason, the author has chosen to present short-term forecasts for development by sticking to forecast data about a three-year period from 2018 to 2020.

In making the forecasts by means of autocorrelation the author has proven the existence of a trend, therefore, the time order contains only a trend and a random component and can be expressed as follows:

$$Y = T + E \tag{1}$$

In this equation (1) "**T**" marks the trend (the major trend), which is formed under the influence of permanent causes/factors during a relatively lengthy period of time and shows the main line of change. This can be a change towards:
- steady increase – then there is an upward trend;
- steady decrease – then there is a downward trend;
- lack of trend – then the time trend is stationary.

"**E**" marks the random component which forms under the influence of random factors have temporary character and which is still a residual component.

According to the received data of the econometric analysis and the forecast for Bulgaria, equation (1) becomes the following:

$$Y = 23.544 + 0.449.t + E \tag{2}$$

Parallel to this, in the research about Bulgaria, we receive a coefficient of determination $R^2=0,774$, i.e., this coefficient has a relatively high value. It shows that 77.4% of the total dispersion of the predictor variable can be explained with the factor dispersion. In this particular case, we can claim that 77.4% of the differences in the relative ratio of the employed persons with a university degree are due to a permanent trend. The remaining 22.6% are due to the influence of other reasons which are not related to the permanent trend (random fluctuations). As the coefficient of determination R^2 is high, we can claim that the linear model describes well the permanent trend in the change of the relative ratio of employed persons with a university degree.

Interpreting the coefficient of the linear model shows that during the whole researched period the average annual increase of the ratio of employed persons with a university degree in Bulgaria is by 0.45 percentage points (more precisely 0.449).

In choosing the model for presenting the forecast we have taken into consideration the fact that all models are adequate and could be used for the purpose. The highest coefficient of determination is shown by the polynomials of higher degree (square and cubic function), but they are not appropriate for performing the forecast analysis as they would result in unrealistically high or low forecast values. For this reason, we have chosen the linear function as the most appropriate for the purposes of forecasting and at the same time having a high coefficient of determination.

By implementing the linear mathematical model, we have carried out the extrapolative forecasting for Bulgaria with a three-year horizon in mind. On the basis of the assumption that over the next three years, the same trend of development will remain unchanged, we have applied the linear model to assess the forecast values for a three-year period (2018, 2019 and 2020); we have also measured the standard forecast error.
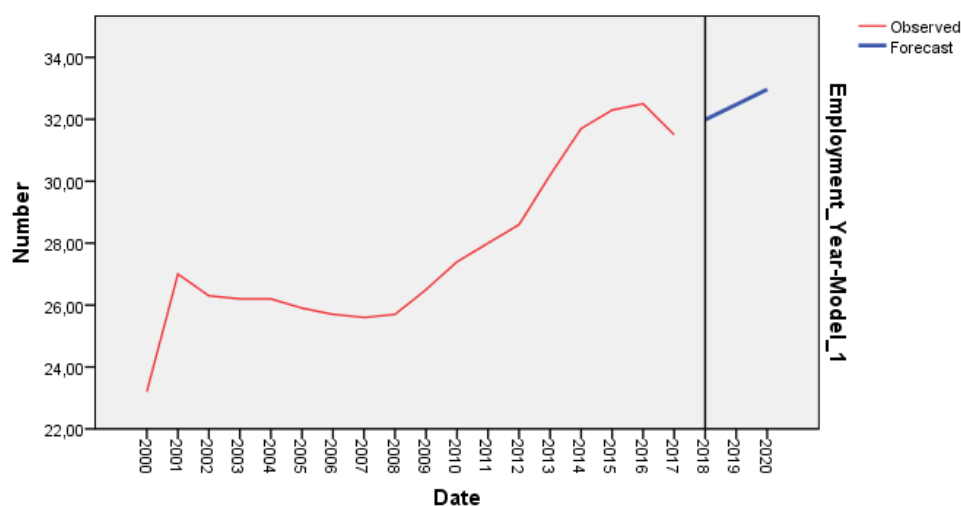
Figure 1. **Relative ratio of employed persons with a university degree against the total number of employed persons aged 20–64 in Bulgaria (2000–2020)**

Table 2

Forecast of the relative ratio of employed persons with a university degree in Bulgaria aged 20–64 against the total number of employed persons (2018–2020)

Forecast

Model		2018	2019	2020
Employment_Year-Model_1	Forecast	31.99	32.48	32.96
	UCL	34.32	35.78	37.01
	LCL	29.65	29.17	28.92

For each model, forecasts start after the last non-missing in the range of the requested estimation period, and end at the last period for which non-missing values of all the predictors are available or at the end date of the requested forecast period, whichever is earlier.
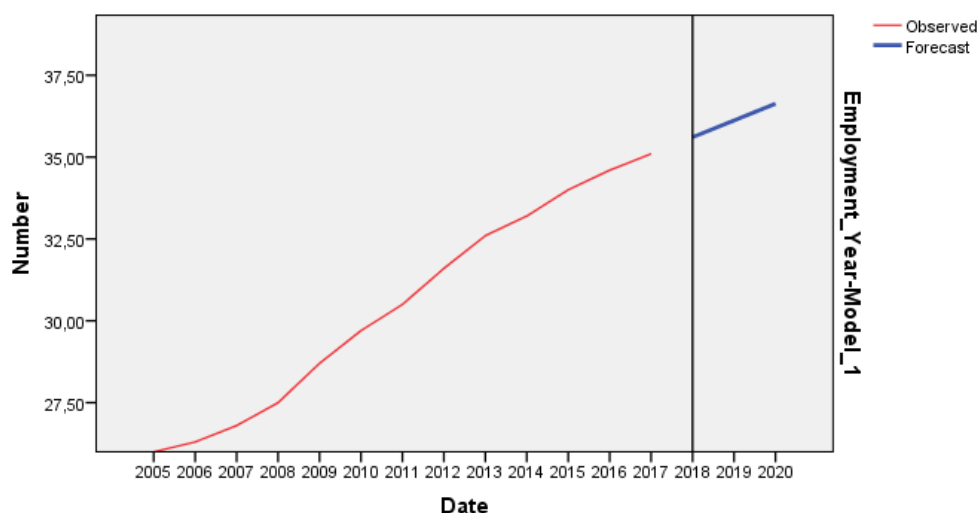
Table 3

Relative ratio of employed persons with a university degree in Bulgaria aged 20–64 against the total number of employed persons (2000–2020)

Year	Relative ratio of employed persons with a university degree (%)	Year	Relative ratio of employed persons with a university degree (%)
2000	23.2	2011	28
2001	27	2012	28.6
2002	26.3	2013	30.2
2003	26.2	2014	31.7
2004	26.2	2015	32.3
2005	25.9	2016	32.5
2006	25.7	2017	31.5
2007	25.6	*2018*	*31.99*
2008	25.7	*2019*	*32.48*
2009	26.5	*2020*	*32.96*
2010	27.4		

* Author's own calculations based on Eurostat data for the period 2000-2017: Employment by educational attainment level - annual data, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsi_educ_a&lang=en

The insignificant drops of the relative ratio of the employed persons with a university degree in Bulgaria aged from 20 to 64 registered in the period 2003–2007 and in the last year – 2017 are considered as a temporary phenomenon which will not have an impact on the permanent trend of an increase. It is forecast that the upward trend which began after 2007-2008 will continue and will remain unchanged throughout the next three years. According to the results of the forecast, we can expect that in 2018 the ratio of the employed persons with a university degree will amount to 31.99%, while in 2019 – to 32.48%, and in the last forecast year – 2020 – to 32.96%[5]. Therefore, the forecast is for an increase of the employed persons with a university degree and for an upward trend in the trajectory of percentage

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[5] In reporting 95% of guaranteed probability, we can claim that the relative ratio of the employed persons with a university degree against the total number of employed persons aged 20-64 in Bulgaria can be within the intervals:
- from 29.65% to 34.32% for 2018;
- from 29.17% to 35.78% for 2019;
- from 28.92% to 37.01% for 2020.

change of the employed persons in the field of higher education throughout the next three years.

Similarly, a forecast has been made for the relative ratio of the employed persons with a university degree in the EU aged 20–64 as part of the total number of employed persons. In the same way, by means of autocorrelation we have proven the existence of a trend due to which the time order of the forecast contains only a trend and a random component. In the case of the EU, equation (1) becomes:

$$Y = 24.673 + 0.834.t + E \tag{3}$$

In this research, on the EU level, it turns out that the coefficient of determination is $R^2=0.991$, i.e., it has a much higher value. It even exceeds the value of the same coefficient for Bulgaria, from which it follows that the remaining 0.09% are due to the random component. The coefficient before the time variable shows that for the whole researched period, the average annual increase of the relative ratio of the employed persons with a university degree against the total number of employed persons is 0.84 percentage points (more precisely 0.834).

*Figure 2. **Relative ratio of employed persons with a university degree in the EU aged 20–64 against the total number of employed persons (2005–2020)***

Table 4

Forecast for the relative ratio of employed persons with a university degree in the EU aged 20–64 against the total number of employed persons (2018–2020)

Forecast

Model		2018	2019	2020
Employment_Year-Model_1	Forecast	35,61	36,12	36,63
	UCL	36,16	37,29	38,56
	LCL	35,07	34,95	34,71

For each model, forecasts start after the last non-missing in the range of the requested estimation period, and end at the last period for which non-missing values of all the predictors are available or at the end date of the requested forecast period, whichever is earlier.

Table 5

Relative ratio of employed persons with a university degree in the EU aged 20–64 against the total number of employed persons (2000–2020)

Year	Relative ratio of employed persons with a university degree (%)	Year	Relative ratio of employed persons with a university degree (%)
2005	26	2013	32,6
2006	26.3	2014	33.3
2007	26.8	2015	34
2008	27.5	2016	34.6
2009	28.7	2017	35.1
2010	29.7	*2018*	*35.61*
2011	30.6	*2019*	*36.12*
2012	31.6	*2020*	*36.63*

* Author's own calculations based on Eurostat data for the period 2000-2017: Employment by educational attainment level - annual data, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsi_educ_a&lang=en

The received results of the forecast for the EU show that similar to Bulgaria in the EU we expect the relative ratio of the employed persons with a university degree in the EU aged 20–64 to increase. The basis of the established upward trend for the EU in the period of the next three years will probably be formed by the coefficients of employment of the persons with a

university degree which will respectively amount to 35.61% in 2018, to 36.12% in 2019 and to 36.63% in 2020.[6]

The results of the forecasts of the selected structural indicator show that in the EU and in Bulgaria we can expect the establishment of analogous trends. It makes an impression and it is worth mentioning that the amplitude of the probable future changes in the percentage of the employed persons with a university degree in the EU and in Bulgaria is similar, while the corrections will have an upward direction with a difference of nearly half percentage point per year.

4. Conclusion

The research and the forecast that we have carried out for Bulgaria and the EU as a whole confirm the author's conclusion that throughout the next years, we can expect the trend of increasing the educational degree of the employed persons to continue. In the conditions of fast developing technologies and the implementation of new ICTG in the process of production and services, employers will more often seek and prefer workforce that has specific skills and new qualifications. It shall have higher education and qualification corresponding to the technologized traditional and developing new digital industries, which shall guarantee them better flexibility, adaptiveness and the ability to constantly learn, including in the process of work; the workforce shall be ready and shall realize the necessity to improve and expand their knowledge and skills by adding up new ones – something which will more often become a necessity.

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[6] In reporting 95% of guaranteed probability, we can claim that the relative ratio of the employed persons with a university degree against the total number of employed persons aged 20-64 in the EU can be within the intervals:
- from 35.07% to 36.16% for 2018;
- from 34.95% to 37.29% for 2019;
- from 34.71% to 38.56% for 2020.

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