THE USV ANNALS OF ECONOMICS AND PUBLIC ADMINISTRATION | VOLUME 24, ISSUE 1(39), 2024

THE ROLE OF EDUCATION AND INVESTMENT IN EDUCATION ON THE LABOR MARKET INSERTION OF RECENT GRADUATES

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Abstract:
The issue of the insertion of graduates into the labor market remains a priority for decision-makers in international higher education. These concerns have received increased attention in the current climate of uncertainty in the labor market. Policymakers continue to emphasize the importance of 'employability skills' so that graduates are fully prepared to meet the challenges of the ever-changing labor market. This paper reviews some of the key empirical and conceptual themes in the field of labor market placement of higher education graduates over the last decade and attempts to demonstrate the role of educational attainment and investment in education on labor market placement. With the help of econometric modelling, we tried to highlight the influence on the insertion on the labor market of the level of graduated studies, the financing given to education and public investments in the education system.

Key words: insertion on the labor market, employment rate, education.

JEL classification: H83, I26.

Received 31 March 2024; Accepted 21 June 2024

INTRODUCTION

Today's society is characterized by a fast dynamic, which raises a series of issues at the educational and economic-social level. Thus, society must find the appropriate ways to solve these problems and create the conditions for future economic and social development. One of the major challenges of modern society is the adaptation of the educational sector to the demands of the labor market, characterized by a permanent and fast dynamic. In European theory and practice, it is considered that the main asset of the educational process is a risk of unemployment, the lower the higher the level of education. But still, there are graduates of higher education who fail to integrate into the labor market or fail to find a job commensurate with the skills acquired during their years of study. The higher education system is obliged by the assumed public responsibility to offer students the opportunity to follow study programs that allow them to easily and appropriately integrate into the labor market. In other words, through the autonomy with which universities are invested, they have the power to use public money responsibly and in accordance with the requirements of interested parties: students, employers, government authorities, etc.

The purpose of the research is aimed at highlighting the impact that the level of studies of future graduates and investments in the educational system have on the employment rate of recent graduates. Our research aims to place the issue of graduate insertion in the context of the changing inter-relationships between higher education institutions and the labor market and the public responsibility assumed by higher education institutions.

As for the novelty element of this research, it is given precisely by the way of approaching the impact that the education system has on the insertion in the labor market. The suggestions we propose based on our analysis should be a starting point for decision-makers to achieve the goal of sustainable development by supporting quality education at the level of education in general and higher education in particular.

The assumptions we start from are:

1. The level of education influences the employment probability of recent graduates;
2. The value of public investments in the educational system influences the employment rate of recent graduates;

3. The amount of public funding of the education system influences the employment rate of graduates.

In this research we will analyze the existence of a long-term link between the level of studies and the value of investments in the education system on the employment rate of recent graduates, based on data series from 2012 - 2023 and with the help of IBM SPSS Statistics 26 and we will estimate a econometric model. The indicators used were chosen through the prism of the decision-making role of universities, but also of the government regarding the educational path of future graduates.

As for the research methodology, it is based in the first part of the paper on consulting a consistent number of bibliographic sources, represented by scientific articles published in national and international journals. The research methodology considered the application of various methods, such as observation, comparative analysis, selection, deduction and induction. In the second part of the paper, our research is quantitative in nature and intends to demonstrate and emphasize the importance of education in ensuring graduate employability. We can also state that it falls within the positive theory, and the tool used is the case study.

LITERATURE REVIEW

In international specialized literature, the term "employability" is used with the meaning of employment capacity or insertion on the labor market. Thus, the definitions that this concept has come together in three ways of approach.

The first approach to employability foregrounds the "capabilities of individuals." (Hogan et al., 2013) Thus, it is considered that the insertion on the labor market of an individual depends on his personal and intrinsic characteristics. Hillage and Pollard (1998) call these characteristics capabilities, Yorke (2006) calls them a set of achievements – skills, understandings and personal attributes, and for De Voset et al. (2011) these are measured in terms of ability and willingness. Morrison (2012) synthesizes all these definitions by highlighting the absolute dimensions of employability which considers that individuals possess the appropriate skills, abilities and attitudes that employers need.

The second approach to labor market insertion draws attention to the relative dimensions of employability, ignoring the fact that employability is primarily determined by the labor market. Brown et al. defines employability as "the relative chances of finding and maintaining different types of jobs." (Brown et. al, 2003) It is considered that insertion in the labor market can be influenced by external factors: "social, institutional and economic." (Sin & Amaral, 2017) This suggests that we will need to understand the relevant political, social and economic contexts, as well as how these factors interact to "fully understand the concept." (Speight et al, 2012)

The third approach to the concept emphasizes the "duality of labor market insertion", which stems from the need to understand both the absolute and relative dimensions of employability. Small et al. (2018) define the concept as "the ability to be autonomous in the labor market, using individual knowledge, skills and attributes and adapting them to the employment context, presenting them to employers, while taking into account external and other constraints."

The latter two approaches recognize the importance of personal characteristics that contribute to a recent graduate's obtaining a job, but also emphasize the influence of external factors on employment opportunities.

As can be seen an unanimously accepted definition of employability has not been reached in the specialized literature. This has led to the emergence of different approaches to its measurement. The Council of Europe measures labor market insertion through the employment rate of recent graduates, calculated as the percentage of graduates between 20 and 34 employed three years after graduation. But it should be noted that the student employment rate has been used as "a simple indicator of employability" (Yorke, 2006), even though employability is different from employability. Employment statistics only measure the actual acquisition of a job. Employability goes beyond this and measures the graduate's potential to obtain and integrate into a job. It is more

than a set of personal attributes and a destination, but “a changing process” (Taylor, 2016) that needs to be continuously improved to be relevant in the labor market.
The insertion on the labor market of recent graduates should not be considered simply as an end goal, but rather as an adaptation of the skills formed by higher education institutions to the demands of the labor market. Thus, educational institutions must develop study programs required by the labor market or adapt existing programs to market requirements. The idea of employing graduates needs to be reconsidered, focusing not only on employment, but on "how" employment is achieved.

The interaction between the higher education system and the labor market has been considerably reshaped over time. This was mainly determined by a series of changes that took place at the level of higher education institutions, as well as in the nature of the economy. The important changes come from the gradual massification of higher education institutions in recent decades and the state's commitment to public funding. Thus, the state continues to exert pressure on the system to improve its outcomes, quality and overall market responsiveness (DFE, 2010). Such changes have coincided with the globalization of the economy, which places increasing demands on the workforce and requires new forms of work-related skills. Thus, traditionally, the higher education system was seen as a base from which graduates could successfully integrate into economic life, as well as effectively serve the economy.

Even if it is recognized in the specialized literature that the responsibility regarding the insertion in the labor market belongs to a wide spectrum of interested parties, still the greatest responsibility rests with the institutions of higher education, which must offer "degrees of lasting value to its beneficiaries." (Cheng et al., 2022) This requires educational institutions to be open to involving employers and society in curriculum design. It will also mean teaching students transferable work-readiness skills that employers need, including teamwork and developing a work ethic. The emphasis on the primary role of higher education institutions in the labor market insertion of graduates has raised concerns that the government and employers are absolved of such responsibility. Sin and Neave (2016) argue that higher education institutions have “a utilitarian role” (Sin & Neave, 2016) in the formation of advanced knowledge, skills and competencies that students need throughout their professional lives. This theory is also agreed by Frankham (2017), who believes that the burden of responsibility for government policy in this area is assigned to "those who are subject to these policies, rather than those who instigate them." Thus, it is suggested that decision-makers should take public responsibility for all approved study programs in order to improve the labor market insertion of recent graduates.

Employment is an important point in the National Strategy for the Sustainable Development of Romania 2030, included in Objective 8: Decent work and economic growth. The focus of this objective is "the promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent jobs for all." The concept of public accountability in university management has undergone a paradigm shift, in the sense of moving "from following rules to producing results." (Burke, 2005) In higher education, the results take into account the way of using public money for the needs imposed by the labor market, needs translated through graduates' skills. Performance-based funding is one of many accountability programs and a widely recognized measure to improve public accountability in higher education. This mode of financing is recognized as a functional tool that will increase the degree of accountability of higher education institutions, as managers are assigned the responsibility of meeting the targets set according to a series of measurable indicators, such as the insertion on the labor market of young graduates and financing the study programs required by the labor market.

But achieving these changes in the higher education system requires a paradigm shift: "from uniformity and dispersion to differentiation and concentration." (Miclea, 2007)
“A positive relationship between education and the workforce is essential for any economy to grow and create value. This relationship was best reflected by an increasing supply of well-educated workers that promoted economic development. The current choices in the direction of education significantly affect the performance of the labor market in the future, the education system being responsible for providing knowledge and skills to individuals for effective participation in the life

of society, for expanding current knowledge and for the ability to be able to activate, integrate and reintegrate with success in the labor market." (Serban, 2012)

PAPER CONTENT

Through this paper, we aimed to determine the connection that the value of investments in the education system and the level of education has on the employment rate of recent graduates. To achieve our goal, we have chosen a series of indicators presented in Table no. 1.

Table no. 1 – Abbreviation of the indicators used in the analysis

No. Crt.	*Indicator*	*Abbreviation*
1.	*Employment rates of recent graduates*	*ERG*
2.	*Tertiary education level*	*TEA*
3.	*Share of investments in GDP in education*	*IGDP*
4.	*Public expenditure on education (tertiary level)*	*PEE*

Source: Own processing

To carry out our approach, we considered as a dependent variant ERG - the employment rate of recent graduates, and as independent variables PEE - the level of tertiary studies, IGDP - the share of investments in GDP in education and TEA - Tertiary education level. The analyzed period is 2012-2023, a period imposed by data availability. The data were taken from https://ec.europa.eu/eurostat and processed with the econometric modeling program IBM SPSS Statistics 26. Table no. 2 presents the variables used in our analysis.

Table no. 2 – Variables Entered/Removed [a]

Model	Variables Entered	Variables Removed	Method
1	PEE, IGDP, TEA[b]	.	Enter

a. Dependent Variable: ERG
b. All requested variables entered.

Source: Own processing in SPSS 26

After processing the data, the obtained results helped us to design an econometric model between the ERG, TEA, IGDP and PEE variables. Table no. 3 shows the correlation matrix for the analyzed variables.

Table no. 3 – Matrix of Correlations

		ERG	TEA	IGDP	PEE
Pearson Correlation	ERG	1,000	,290	,562	,680
	TEA	,290	1,000	-,478	,130
	IGDP	-,562	-,478	1,000	-,105
	PEE	,680	,130	-,105	1,000
Sig. (1-tailed)	ERG	.	,180	,028	.007
	TEA	,180	.	,058	,344
	IGDP	,028	,058	.	,372
	PEE	.007	,344	,372	.
N	ERG	12	12	12	12
	TEA	12	12	12	12
	IGDP	12	12	12	12
	PEE	12	12	12	12

Source: Own processing in SPSS 26

As can be seen, there is a link of medium intensity between the amount of public expenditure on tertiary education and the employment rate of graduates, which can be translated by the fact that funding the education system is a prerequisite for completing studies, training future

employees and getting a job. Also, there is a weak link between the level of completed studies and the employment rate of graduates, which indicates that there is a demand for labor in the labor market and the level of studies takes a secondary place. We observe a link of medium intensity between the level of public investment in the education system and the employment rate of recent graduates, which translates into the fact that there are other elements that contribute to the success of the employment rate.

The econometric analysis carried out aims to determine the dependence relationship of the employment rate of recent graduates in relation to the dynamics of some influencing factors considered relevant: the level of tertiary studies, the share of GDP investments in education, public expenditures for education (tertiary level). To achieve the proposed objective, we used the multiple linear regression model of the type:

$$ERG = \alpha + \beta 1 * TEA + \beta 2 * IGDP + \beta 3 * PEE + \varepsilon$$

where:

o ERG – represents the dependent variable of the model,

o TEA, IGDP, PEE – are the independent variables,

o α, β1, β2 and β3 are the parameters of the regression model,

o is the random error variable.

In this phase of the research we aim to demonstrate that the determined models highlight the analyzed economic problem, and the analysis highlights the degree of trust. The goal is to determine the sensitivity of the dependent variable to changes in the independent variables. Table no. 4 manages to highlight this.

Table no. 4 – Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,994 [a]	,992	,983	2.5804003318277	2,322

a. Predictors: (Constant), PEE, IGDP, TEA

b. Dependent Variable: ERG

Source: Own processing in SPSS 26

Following econometric modeling, the value of the correlation ratio that characterizes the analyzed variables is 0.994. Thus, based on the results obtained, we can state that there is a very strong connection between the employment rate of young graduates and the level of education, the share of GDP investments in education and public expenditures for education (tertiary level). From an economic point of view, this means that the level of education as well as the value of current and capital investments influence the employability of graduates. The determination ratio has a value of 0.992 which means that the variation in the employment rate of young graduates is explained in percentage of 99.20% by the variation of the independent variables. In economic terms, this means that the employment rate depends in proportion to 99.20% on the evolution of the level of education of the graduating population, on the amount of funding offered by the state to the educational system, but also on the material base provided to educational institutions.

With the help of statistical processing in the econometric modeling program IBM SPSS Statistics 26, I determined the descriptive statistics for the mentioned indicators, which I centralized in Table no. 5.

Table no. 5 - Descriptive Statistics

	N	rank	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistical	Statistical	Statistical	Statistical	Statistical	Std. Error	Statistical	Statistical
ERG	12	11.2	66.2	77.4	71.833333333333	1.1742394916874	4.0676849197130	16,546
TEA	12	3.6	25.6	29.2	27,583	,3533	1.2239	1,498
IGDP	12	2.62	2.56	5.18	4.1308	,24620	,85286	,727

PEE	12	838.1	1018.3	1856.4	1426,525	100.2228	347.1820	120535,344
Valid N (listwise)	12							

Source: Own processing in SPSS 26

As can be seen in Table no. 5, the lowest employment rate of young graduates was 66.2% (recorded in 2014), and the highest 77.4% (in 2018). Regarding the level of higher education of the population, the lowest percentage was for the analyzed period in 2012 of 25.5%, and the maximum level of 29.2% was recorded in 2019. The level of investments in the educational sector recorded the lowest value in 2017, and the highest value in 2012, the level being close to the values of 2022. Regarding public expenditures on education, they had an upward rhythm during the analyzed period, the lowest value being recorded in 2012 and the largest in the year 2023.

Next, based on the Anova test, we will determine if the multiple linear model made is validated.

Table no. 6 – ANOVA[a] Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	128,739	3	42,913	106,445	.0016 [b]
	Residual	53,268	8	6,658		
	Total	182,007	11			

a. Dependent Variable: ERG

b. Predictors: (Constant), PEE, IGDP, TEA

Source: Own processing in SPSS 26

According to the ANOVA test, the value of the Fisher coefficient F = 106.445, and the value of Sig. for the F test is 0.016, so we can say that the model obtained based on econometric modeling explains the significant dependence between the employment rate of recent graduates and the independent variables: the level of tertiary education, the share of GDP investments in education and public spending on education. According to statistical theory, if sig. It is less than 0.05, the multiple linear model is validated at 95%.

Table no. 7- Coefficients[a] of the Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	74,888	22,403		3,343	,010
	TEA	,126	,727	-038	-,173	,867
	IGDP	,102	1,040	-514	-2.358	,046
	PEE	,107	,002	,631	3,267	,011

a. Dependent Variable: ERG

Source: Own processing in SPSS 26

Following the statistical processing of the variables for the analyzed period, we determined the regression parameters of the multiple linear model and based on it we will create the equation of the model as follows:

$$ERG = 74{,}88 + 0{,}126 * TEA + 0{,}102 * IGDP + 0{,}107 * PEE$$

From an economic point of view, the obtained econometric model shows us how the variation of the employment rate of young graduates is influenced by the variation of the independent variables.

- If TEA increases by 1% and other variables remain constant, then ERG will increase by 12.6% on average. In economic language, if the level of education increases by one percent, then the employment rate of recent graduates increases by 12.6%. This shows us the importance of education level for employment after graduation.

- If IGDP increases by 1% and other variables remain constant, then ERG will increase by 10.2% on average. If the value of investments in the education sector increases by 1%, then the pass

rate of recent graduates increases by 10.2%. This highlights the importance of the technical-material base of the educational system and implicitly on the training of students' skills and abilities for the labor market.

- If PPE increases by 1% and other variables remain constant, then ERG will increase by 10.7% on average. At the level of educational institutions, the increase in public funding by 1% leads to an increase in the employment rate of recent graduates.

Carrying out a retrospective analysis of our model, we can see that the level of education held by the graduate has the greatest influence on the employment rate (12.6%), followed by the amount of public spending on education (10.7%). The lowest influence among the analyzed variables is the value of investments in the educational sector (10.2%).

The Residuals Statistics table shows us the residual values that are at the extremes. Thus, the smallest value of the residual is -3.0444447994232, and the largest value is 3.5766427516937.

Table no. 8 - Residual Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	66.416778564453	76.189186096191	71.833333333333	3.4210436962305	12
Residual	-3.0444447994232	3.5766427516937	,0000000000000	2,2005727969197	12
Std. Predicted Value	-1.583	1,273	,000	1,000	12
Std. Residual	-1,180	1,386	,000	,853	12

a. Dependent Variable: ERG

Source: Own processing in SPSS 26

The Histogram is symmetric and the PP Plot has shifts from the specific theoretical distribution representing the Henry's right.

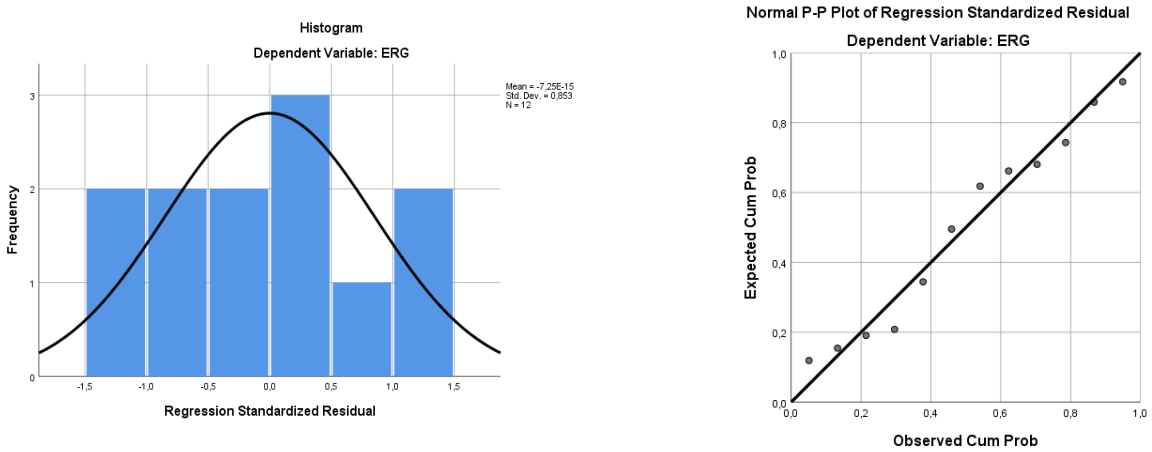

Figure no. 1 - Histogram and PP Plot Chart

Source: Own processing in SPSS 26

The frequency distribution tells us that the values are roughly symmetrical about the median.

The final decisions on the labor market are taken by private actors, but the role of the public sector is to anticipate the skills and provide the necessary skills on the labor market, which is also mentioned in the strategies and recommendations at the international level. The International Labor Organization in Recommendation 195 on human resources development, 2004, in chapter 2 on education, training and lifelong learning, emphasizes that countries "should develop their national capacity, as well as facilitate and assist the development of social partners, of to analyze labor market trends and the development and training of human resources." (ILO, 2004) Among other types of information, data collection could include "identifying, measuring and forecasting trends in the supply of and demand for skills and qualifications in the labor market." (ILO, 2004)

Anticipating future labor market skills needs and employment services are two of the seven components of sound skills and training policies recognized by the International Labor Organization. It highlights that "several methods are used to forecast future skills needs. These include forecasting occupational and skill profiles at different levels of disaggregation; social dialogue; labor market information systems and employment services; and analysis of the performance of training institutions, including follow-up studies […]. Quantitative analysis based on labor market information is good, but it is only reliable when supplemented with qualitative information from employers and workers." (ILO, 2011)

CONCLUSIONS

The present research tried to demonstrate the role of the level of studies completed by recent graduates and the influence exerted by the financing of higher education institutions (tertiary education expenses, as well as public investments in the university system) in relation to the insertion in the labor market. In this sense, data series from the period 2012-2023 taken from https://ec.europa.eu/eurostat were processed. The econometric modeling was done with the help of the IBM SPSS Statistics 26 program and the obtained model allowed us a series of conclusions.

The assumptions from which we started in this research were validated, so that based on the analyzed data, we can say that the three analyzed indicators (level of studies, the value of public investments and the value of public financing of the educational system) influence the employment rate of recent graduates. The results obtained from the econometric modeling highlighted an approximately equilateral influence of the three indicators. However, we can see that the level of education held by the graduate has the greatest influence on the employment rate (12.6%), followed by the amount of public spending on education (10.7%). The lowest influence among the analyzed variables is the value of investments in the educational sector (10.2%).

The obtained results affirm once again, if necessary, the major role of education in the integration into the labor market. European countries in general and Romania in particular must adopt measures to adapt the curriculum of higher education institutions to the requirements of the labor market, implement a series of instruments for monitoring the insertion of graduates on the labor market, increase the degree of transparency and responsibility in the use of public funds, to correlate the funding of study programs with the employment rate of recent graduates and to minimize the involvement of politics in the establishment of study programs of universities. These measures are urgently needed, as they have a direct effect on the employment rate and the insertion in the labor market of graduates, but we dare to say that in fact the consequences are much deeper. The economic and social future depends on the young people attending school today and how they manage to complete their appropriate studies and integrate into the labor market.

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