DIGITAL SKILLS IN ENTERPRISES ACCORDING TO THE EUROPEAN DIGITAL ENTREPRENEURSHIP SUB-INDICES: CROSS-COUNTRY EMPIRICAL EVIDENCE

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Abstract. *Nowadays, the development of Internet technology and the effects of digital transformation are leading to the need for more skilful information and communications technology (ICT) specialists in almost every sector of the economy, in order to benefit from technological innovations. That also leads to the need for every employee to be prepared for new changes in production and service delivery processes in their professional life within a modern society. In this study, the factors of digital skills in enterprises that significantly affect the digital entrepreneurship start-up sub-index and digital entrepreneurship scale-up sub-index in the EU countries, are identified and the models are designed to analyse the relationships between the factors. In an increasingly digital world where production processes and service delivery are continuously evolving, EU countries, that is, policymakers and entrepreneurs should be aware of the digital transformation which is happening right now and, thus, pay attention to the digital skills and provide learning opportunities and supportive environment for the workers in acquiring the new skills and knowledge.*

Keywords: *digital economy, digital skills in enterprises, digital entrepreneurship start-up sub-index, digital entrepreneurship scale-up sub-index*

1. INTRODUCTION

Digitalization or increasing usage and developments in ICT infrastructure, has created not only new ways of running the business but also of performing our daily activities. Starting up in business and managing a business in the digital environment implies and includes conducting an e-business or, so-called, electronic commerce via the Internet and other electronic online networks

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(Hafezieh, Akhavan & Eshraghian, 2011). The term paperless or e-commerce was first mentioned by George Pakein in 1975, who stated that technology will by 1995 allow employees to merely press the button (which will replace office documents), and the information will come to all intended receivers (Lider, 2018). Today, there are many terms for transformation in the economy, which is happening under the drastic development of ICT, e.g. *post-industrial economy, knowledge economy, on-line economy, innovation economy,* and *digital economy* (Cohen & DeLong & Zysman 2000; Pohjola 2002; Hafzieh, Akhavan & Eshragian 2011; Anckar 2016, pp.36).

In the European Union, the most commonly used term is the *digital economy*. According to the European Commission, *digital economy is growing 7 times as fast as the rest of the economy* (European Commission, 2018a, pp.3). Thus, many business opportunities arise for entrepreneurs that lead to digital entrepreneurship. Unlike traditional entrepreneurship, digital entrepreneurship uses computerized technologies as the tools for communication within their businesses, and outside, between the organization and its key interested parties (DeSanctis & Monge, 1999; Hafzieh, Akhavan & Eshragian 2011, pp. 269). In addition, the European Commission states that a fully functioning Digital Single Market could benefit *€415 billion per year to our economy and create hundreds of thousands of new jobs* (European Commission, 2018b). Digital economy is significant because it increases innovation, growth and development, employment and competitiveness of the European Union. The spread of digital technology is having an effect on the changing employment structure, leading to *the automation of routine tasks* and the creation of different types of occupations, consequently leading to the need for a workforce with developed ICT skills in almost every sector of the economy, in order to take advantage of technological innovation. Moreover, this trend requires that every citizen should possess at least basic digital skills with the purpose of learning, working, and participating in contemporary society (European Commission, 2018b). Moreover, the employees have to be prepared for new changes in production and service delivery processes in their professional life to avoid job loss or end up in a low-paying job.

However, there are still barriers (challenges) which restrict a fully functioning of digital economy. For example, in the domain of entrepreneurship, the enterprises, especially the start-ups tend to take less advantage of online opportunities and possibilities. One of the reasons for that, is the lack of digital skills. The data show that in the European Union, *more than 50% of the adult population* do not possess ICT skills or possess only the skills required to fulfill basic tasks in the digital environment. According to OECD (Organization for Economic Cooperation and Development) *only around a third of the workers* have advanced intellectual skills, which empower for solving problems and finding out solutions (OECD, 2013; OECD 2016). In a progressively digital world where the need for employees' skills is constantly evolving, it is important to provide opportunities for the workers to participate and learn new skills (OECD, 2016). Consequently, the possible lack of digital skills in enterprises represent the research problem of the paper.

In the study, the research goal was to design a model in which the factors of digital skills in enterprises that significantly affect the digital entrepreneurship start-up sub-index and digital entrepreneurship scale-up sub-index in the EU countries will be identified. Thus, in the empirical part of the paper, according to the quantitative and statistical methods the goal was to systematically and comprehensively analyse the factors of

digital skills in enterprises, which affect, separately, digital entrepreneurship start-up sub-index and digital entrepreneurship scale-up sub-index in the EU countries, and to examine the relationships between the factors. In view of that, two research propositions were formulated, as follows:

Digital skills in enterprises positively and significant affect the digital entrepreneurship start-up sub-index and the digital entrepreneurship scale-up sub-index.

Digital skills in enterprises have higher impact on the digital entrepreneurship start-up sub-index than on the digital entrepreneurship scale-up sub-index.

For the purpose of conducting research, the secondary data were obtained from the database of Eurostat and the research is cross-country (done on 28 EU Member States).

In the next section, a brief literature review is given. In Section 3, the data sample and methodological framework used in the research are described. In Section 4, the results are discussed and the conclusion is given in Section 5.

2. LITERATURE REVIEW

Since digital economy is growing at a fast pace, the competition for skilled personnel is in its maturity phase. The dynamics of innovation are very intense and the demand for skilful, competent and well-trained professionals is high (Hafkesbrink & Schroll, 2010). The enterprises are able to use ICT to take advantage of enhancements, for instance, lower the costs, increase efficiency and effectiveness, improve the decision-making process and increase the market competitiveness. In a study of the relationship between the distribution of ICTs and changes in skills in business organizations in the United Kingdom, Hwang (2004) found out that workforce education and training are significant in adjusting employees' skill set to the fast evolution of ICT (Mutula & Van Brakel, 2007). That claim is supported by the fact that in Italy in 2002, in the workplace, only one worker in five had basic ICT skills. The shortage of the required skills was more evident in specific technical areas, so that an estimated 60.000 jobs were unoccupied (Stanca, 2002; Mutula & Van Brakel 2007).

Van Dijk and Hacker (2003) also state that among four barriers to ICT access, the lack of digital skills is one of them, usually being affected by insufficient user-friendliness and training or social support. Therefore, the situation requires a stronger involvement by business owners or managers investing more in training and education of each employee, thus providing them with the support in acquiring basic ICT skills. Such involvement might, consequently, ease the implementation process of electronic business solutions suitable for their enterprise. In addition, it was found that the smaller the enterprise, the benefits gained from the implementation of ICT into the business are greater (with regard to financial indicators).

Furthermore, Carlos Moedas (2018) states that Europe enables creation of many new enterprises, but it is lagging behind in the development of new digital platforms, and the reason might lay in the lack of transformational entrepreneurs who have disrupted entire industries globally (European Commission, 2018d).

Criscuolo et al. (2014) point out that in order to benefit from technological innovations, the skilled human capital dimension in new-born enterprises or start-ups is very important. Those start-ups, which are technology-oriented are mainly based on innovative business models, that realize new ideas on the market, by providing innovative and competitive products and services. Consequently, such small innovation-based

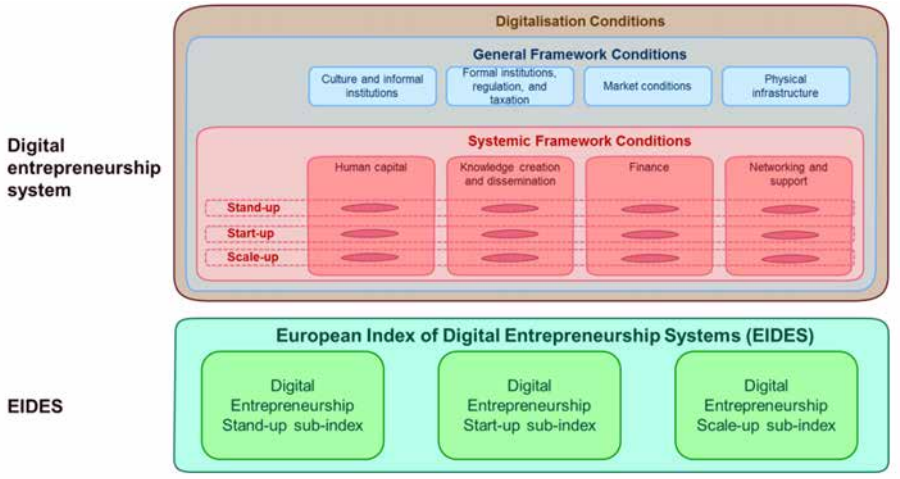
firms, have a tendency to grow faster than other companies and thus contribute non-proportionately to net job creation (European Commission, 2018c).

Also, it is important to point out that high-growth firms also create more new jobs in comparison to other firms. A large proportion of these businesses are start-ups that are growing into larger firms. Newly-established companies, or start-ups, often technology-backed, generally combine rapid growth, high reliance on the innovation of product, processes, and financing. Also, they pay great attention to new technological advancements and the widespread use of innovative business models and cooperative platforms. They increase innovation and competitiveness in the EU and thus boost the economy (EUR-Lex, 2016).

3. DATA AND METHODOLOGY

In the present paper, the Eurostat database and European Index of Digital Entrepreneurship Systems (EIDES) represent the data for the research. From the Eurostat database the secondary data were used for identification of the independent variables. The data provided in this scope are collected annually by the National Statistical Institutes or Ministries and are based on the Eurostat's annual model questionnaires on ICT usage and e-commerce in enterprises (Eurostat, 2018). The data for 2017 were used in the research. The statistical unit is the enterprise and the used unit in the research was percentage of enterprises. For dependent variables the data from EIDES report were used. The report is published in 2018 by the *Joint Research Centre (JRC)* - the European Commission's science and knowledge service. The report provides the framework and systemic conditions for stand-up, start-up, and scale-up enterprises in the European Member States. The EIDES gives the evidence-based scientific support of the extent of the digital entrepreneurial ecosystem to the European policymakers (European Commission, 2018c). Namely, the purpose of the EIDES is to provide insight into the digitally enhanced conditions for entrepreneurial *stand-up, start-up* and *scale-up* activity in the EU countries. The structure of the EIDES is shown in Figure 1.

Figure 1: The structure of the EIDES



Source: European Commission, The European Index of Digital Entrepreneurship, 2018

Whereas the General Framework Conditions apply generally to entrepreneurship, the EIDES distinguishes between three stages of the entrepreneurial dynamic when it comes to Systemic Framework Conditions. These we call *Stand-up, Start-up,* and *Scale-up* stages. Firstly, the stand-up stage involves all activities and mechanisms related to the self-selection of individuals and teams into the entrepreneurial process. Secondly, the start-up stage involves all activities and mechanisms related to the actual launching of a new venture, including seeking and refining the concept and experimenting with the business model. Once a robust and scalable business model has been discovered, the scale-up stage covers all scaling up activities.

Accordingly, Systemic Framework Conditions are divided into three sub-indices, each representing one of the three stages. For each systemic framework condition, each of the three stages is calculated as the *post-normalization arithmetic average* of the pillar variables. The overall value of the EIDES for the Systemic Framework Conditions is then calculated as the arithmetic mean of the sub-index values (European Commission 2018c). In addition, each stage constitutes its own sub-index and the focus of the study was just on the start-up and scale-up sub-index.

The four pillars for each stage are used with different indicators and those are *Human Capital, Knowledge Creation and Dissemination, Finance* and *Networking and Support.* Human Capital and Knowledge Creation stages include following indicators for digital entrepreneurship star-up sub-index: *Tertiary education enrolment* (WEF), *Percentage of universities with top rankings in international league tables* (Webometrix), *STEM education, Human resources in science and technology* (Eurostat), *Employed ICT specialists* (Eurostat), *Quality of scientific research institutions* (WEF)and *Technology absorption* (WEF). Furthermore, regarding the digital entrepreneurship scale-up sub-index, the Human Capital and Knowledge Creation stages include following indicators: *Lifelong learning* (Eurostat), *Extent of staff training* (WEF), *Quality of management schools* (WEF), *Internet use: looking for information* (Eurostat), *Internet use: doing online course, GERD* (Eurostat), *Availability of scientists and engineers and Number of PCT patent applications* (WEF), *Firm-level technology absorption* (WEF), *Capacity for innovation* indicators, *University-industry collaboration in R&D* (WEF) *and Economic Complexity index* (Atlas Media), *Enterprises who have ERP software* (Eurostat)and *the Website has online ordering, reservation or booking offered* (Eurostat) (European Commission, 2018d).

So far it can be seen how the digital entrepreneurship indices include indicators which are more concerned with education and with some basics of the Internet use than with digital skills (for the instance: tertiary education enrolment, quality of management schools, percentage of universities with top rankings in international league tables, STEM education and the human resources in science and technology indicator, employed ICT specialists, Eurostat Lifelong learning, Internet use: looking for information and Internet use: doing online course indicators). There is not much focus on digital skills in enterprises and training provided for the employees nor on the demand for digitally-skilled potential employees.

Thus, for the purpose of this research, the following variables are taken from the Eurostat database: *percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills variable* (x_1), *percentage of enterprises that employ ICT specialists' variable* (x_2) and *percentage of enterprises where ICT functions are mainly performed by own employees' variable* (x_3). It is assumed that these factors affect digital entrepreneurship sub-indices. Furthermore, in the research, only the start-up and scale-up digital entrepreneurship sub-indices were used to address the activities of the enterprises.

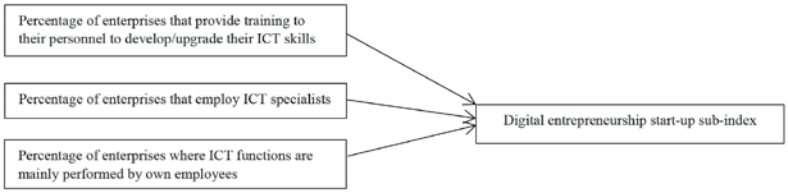
These data are going to be used for the multiple regression analysis (Marketing Research with SPSS, 2008), with two models showing how independent variables affect the scope and the content of the digital entrepreneurship start-up sub-index and scale-up sub-index. Moreover, the correlation between the independent and dependent variables will be checked.

Taking into account theoretical background, the research hypotheses are as follows:

- H1: The correlation among digital skills variables in enterprises and digital entrepreneurship sub-indices is positive and significant;
- H2: Percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills variable is positively related to the digital entrepreneurship start-up sub-index and the digital entrepreneurship scale-up sub-index of EU countries;
- H3: Percentage of enterprises that employ ICT specialists' variable is positively related to the digital entrepreneurship start-up sub-index and the digital entrepreneurship scale-up sub-index of EU countries;
- H4: Percentage of enterprises where ICT functions are mainly performed by own employees' variable is positively related to the digital entrepreneurship start-up sub-index and the digital entrepreneurship scale-up sub-index of EU countries;
- H5: Regression coefficients for digital entrepreneurship skills variables statistically significantly differ between digital entrepreneurship start-up sub-index and the digital entrepreneurship scale-up sub-index of EU countries.

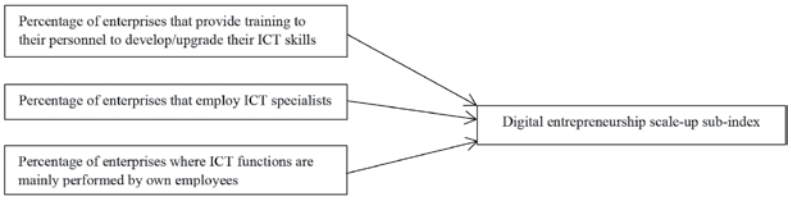
The testing of the hypothesis H1 is conducted by Pearson's correlation coefficient, and the testing of the hypotheses H2, H3, H4 will be done by two multiple regression models, as dependent and independent variables are numerical. H5 is going to be tested by analysis of regression coefficients. The independent variables, which represent the digital skills in enterprises for those two models will be the same: percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills variable (x_1), percentage of enterprises that employ ICT specialists' variable (x_2) and percentage of enterprises where ICT functions are mainly performed by own employees' variable (x_3). The dependent variable in the first multiple regression model is the digital entrepreneurship start-up sub-index (y_1) and in the second model the digital entrepreneurship scale-up sub-index (y_2). The multiple regression models are shown in Figure 1 and Figure 2.

Figure 1:Model of regression analysis of digital skills in enterprises and digital entrepreneurship start-up sub-index



Source: authors

Figure 2:Model of regression analysis of digital skills in enterprises and digital entrepreneurship scale-up sub-index



Source: authors

Regression models in a stochastic form are presented in formulas (1) and (2):

$$Y_1 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + e \quad (1)$$

$$Y_2 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + e \quad (2)$$

Where:

y_1 - dependent variable: value of the digital entrepreneurship start-up sub-index;

y_2 - dependent variable: value of the digital entrepreneurship scale-up sub-index β_0, β_1, β_2, β_3 value of the regression coefficients;

x_1- independent variable: percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills;

x_2 - independent variable: percentage of enterprises that employ ICT specialists;

x_3 - independent variable: and percentage of enterprises where ICT functions are mainly performed by own employees;

e – residual.

4. RESULTS AND DISCUSSION

In this section, the results of the testing of hypotheses H1, H2, H3, H4 and H5 are presented and discussed.

The results of the correlation between the dependent and independent variables are shown in Table 1. Also, the value of the Pearson Correlation coefficients is shown in Table 1, as well as significance (Sig.). The sample size is n=28 which represents the EU Member States.

Table 1: Correlation among dependent and independent variables

		y_1	y_2	x_1	x_2	x_3
y_1	Pearson Correlation	1	.989**	.770**	.521**	.605**
	Sig. (2-tailed)		.000	.000	.004	.001
y_2	Pearson Correlation		1	.742**	.488**	.597**
	Sig. (2-tailed)			.000	.008	.001
x_1	Pearson Correlation			1	.746**	.297
	Sig. (2-tailed)				.000	.125
x_2	Pearson Correlation				1	.023
	Sig. (2-tailed)					.908
x_3	Pearson Correlation					1
	Sig. (2-tailed)					
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: authors

Taking into account the results, the correlation between the variables is positive in all cases. The correlations between independent variables x_1, x_2 and x_3 and dependent variable y_1 are strong and statistically significant at $p<0.01$. The correlations between the independent variables x_1, x_2 and x_3 and dependent variable y_2 are statistically significant too ($p<0.01$), but weaker than with the dependent variable y_1. Among the independent variables the strongest correlation is with x_1 (percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills) with y_1 (digital entrepreneurship start-up sub-index) and y_2 (digital entrepreneurship scale-up sub-index), is 0.770. Based on the above-presented results the hypothesis H1 can be accepted.

In Table 2 the results of multiple regression model for dependent variable y_1 (start-up sub-index) are presented. In Table 3, the results of multiple regression model for dependent variable y_2 (scale-up sub-index) are shown and discussed. Considering the models, a normal distribution is fulfilled.

Table 2: Results of the multiple regression analysis of digital skills in enterprises and digital entrepreneurship start-up sub-index

Model I	B	Std. Error	Beta	t	Sig.	Collinearity Statistics	
						Tolerance	VIF
Constant	-9.719	10.482		-.927	.363		
x_1	1.111	.319	.589	3.487	.002	.365	2.736
x_2	.226	.503	.072	.449	.658	.401	2.496

Model I	B	Std. Error	Beta	t	Sig.	Collinearity Statistics	
						Tolerance	VIF
R	.866[a]						
Adjusted R square	.719						
Std. Error of the Estimate	8.5651						
F-test (Sig.)	24.012 *						

* **Note**: Statistically significant at p<0.001

Source: authors

For digital entrepreneurship start-up sub-index, among the three analysed variables (x_1, x_2, x_3), which represent digital skills in enterprises (percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills, percentage of enterprises that employ ICT specialists, percentage of enterprises where ICT functions are mainly performed by own employees), the variables x_1 and x_3 have a statistically significant role in shaping the country's digital entrepreneurship start-up sub-index. For variable x_1 (percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills) regression coefficient (β_1=1.111) is positive and statistically significant (at p<0.05). The same can be said for the regression coefficient (β_3=1.505, p<0.05) related to variable x_3 (percentage of enterprises where ICT functions are mainly performed by own employees). The correlation coefficient value between the dependent variable and the independent variables is 0.866. Furthermore, the determination coefficient (adjusted R^2=0.719) is quite large, indicating that more than 70% of the variance of digital entrepreneurship start-up sub-index is explained by the independent variables included in particular model. Although, the independent variable x_2 (percentage of enterprises that employ ICT specialists) is correlated with other independent variables (the correlation coefficient between x_1 and x_2 is very strong 0.746), the variable effect on start-up sub index is not high enough to be statistically significant. Thus, the collinearity statistics was is satisfactory. Tolerance factor regarding x_1 and x_2 is less than 0.5 indicating that there might be multicollinearity. However, this does not affect the F-test of the analysis of variance. The F-test value is large (F=24.012), which indicates that most of the variation in the dependent variable is explained by the regression equation and the p-value is 0, suggesting that the model is valid.

Table 3: Results of the multiple regression analysis of digital skills in enterprises and digital entrepreneurship scale-up sub-index

Model II	B	Std. Error	Beta	t	Sig.	Collinearity Statistics	
						Tolerance	VIF
Constant	-12.174	12.389		-.983	.336		
x_1	1.207	.377	.586	3.206	.004	.365	2.736
x_2	.141	.595	.041	.236	.815	.401	2.496

R	.841 [a]
Adjusted R square	.671
Std. Error of the Estimate	10.1232
F-test (Sig.)	19.323 *

*** Note**: Statistically significant at p<0.001
Source: authors

For digital entrepreneurship scale-up sub-index among the three analysed variables (x_1, x_2, x_3), which represent digital skills in enterprises (percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills, percentage of enterprises that employ ICT specialists, percentage of enterprises where ICT functions are mainly performed by own employees), the following regression output reveals that variables x_1 and x_3 have statistically significant role in shaping the country's digital entrepreneurship scale-up sub-index. For variable x_1 (percentage of enterprises that provide training to their personnel to develop/upgrade their ICT skills) regression coefficient (β_1=1.207) is positive and statistically significant (at p<0.05). The same can be concluded for the regression coefficient (β_3=1.602, p<0.05) related to variable x_3 (percentage of enterprises where ICT functions are mainly performed by own employees). The value of correlation coefficient between the dependent variable and the independent variables is 0.841. The determination coefficient (adjusted R^2=0.671) is again quite large, indicating that around 70% of the variance of digital entrepreneurship scale-up sub-index is explained by the three independent variables included in the model. The variable x_2 (percentage of enterprises that employ ICT specialists) is not significantly related to the digital entrepreneurship scale-up sub-index, and again the tolerance factors for x_1 and x_2 are less than 0.5, indicating there might be a multicollinearity. However, the F-test (F=19.323; p-value=0) indicates that the complete model is valid.

It should be checked whether regression coefficient of independent variables for digital entrepreneurship skills (x_1 - enterprises provided training to their personnel to develop/upgrade their ICT skills, x_2 - enterprises that employ ICT specialists and x_3 - ICT functions are mainly performed by own employees) statistically significantly differ between digital entrepreneurship start-up sub-index and the digital entrepreneurship scale-up sub-index of EU countries. To this analysis, based on suggestions in IDRE (2019), a dummy variable called digital entrepreneurship index (group) was coded as 0 for start-up sub-index and 1 for entrepreneurship scale up sub-index. The variables y_x_1, y_x_2 and y_x_3 are the product of entrepreneurship index (y) and independent variables (x_1, x_2 and x_3), which were used in the regression equation together with the original independent variables (x_1, x_2 and x_3) and dummy variables of digital entrepreneurship index as shown in Table 4. In order to verify hypothesis H5 (stating that regression coefficients between groups according to the independent variables statistically significantly differ between each other), the analysis of difference of regression coefficients was done. From the results in Table 4 (statistics for y_x_1, y_x_2 and y_x_3), it can be seen that t values are not significant (p>0.05), indicating that the regression coefficients of digital entrepreneurship start-up sub-index and digital entrepreneurship scale-up sub-index are not statistically significantly different.

Table 4: Analysis of difference of regression coefficients of digital entrepreneurship start-up sub-index and digital entrepreneurship scale-up sub index

Coefficients[a]						
Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	-9,719	11,475		-,847	,401
	group	-2,454	16,228	-,074	-,151	,880
	x_1	1,111	,349	,562	3,185	,003
	x_2	,226	,551	,069	,410	,684
	x_3	1,505	,432	,409	3,480	,001
	y_x_1	,096	,493	,071	,195	,846
	y_x_2	-,085	,779	-,057	-,109	,913
	y_x_3	,115	,612	,069	,188	,851
a. Dependent Variable: *y*						

Source: authors

5. CONCLUSION

Based on the results presented above H2 and H4 are confirmed, while H3 and H5 are rejected. The results presented in this paper, suggest that European Commission, policymakers of the EU member states and entrepreneurs should be aware of the significance of digital transformation and the changes which are happening right now. Namely, they should support the investments (programs, projects, training, and education) in order to improve the conditions for start-ups thus creating more professional opportunities and boosting Europe's competitiveness. Special attention should be paid to the development of digital skills which are nowadays indispensable for the development and introduction of new high value-added products and services that have a positive impact on business. The limitation of the study lays in measuring only direct correlations and impacts between the mentioned variables and the sample of countries. The study only examines the direct effects of the three indicators representing the digital skills and the two digital entrepreneurship sub-indices of the 28 EU member states. Those limitations, at the same time, provide the basis for future research. The digital entrepreneurship start-up sub-index and scale-up sub-index, and other indicators related to the digital economy can be analysed in future studies to get a broader picture of the conditions and relationships between digital entrepreneurship and the labour force.

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DIGITALNE VJEŠTINE U PODUZEĆIMA PREMA KOMPONENTAMA EUROPSKOG INDEKSA DIGITALNOG PODUZETNIŠTVA: KOMPARATIVNI EMPIRIJSKI DOKAZI

Sažetak. *U suvremenim uvjetima, razvoj internetske tehnologije i efekti digitalne transformacije uzrokuju potrebu za informacijsko-komunikacijskim specijalistima, koji imaju višu razinu vještina, i to u gotovo svakom sektoru gospodarstva, a kako bi se ostvarila korist od tehnoloških inovacija. Navedeno dovodi i do potrebe pripreme svih zaposlenika za promjene proizvodnih, odnosno procesa pružanja usluga. U ovom se radu identificiraju čimbenici digitalnih vještina zaposlenika, koji značajno utječu na komponente indeksa stvaranja start-up poduzeća te digitalnog poduzetništva u zemljama-članicama EU-a. Također se dizajniraju modeli, potrebni za analizu odnosa između navedenih čimbenika. U sve više digitaliziranom svijetu, u kojem se proizvodni i uslužni procesi sve više mijenjaju, države-članice EU-a, odnosno donositelji njihovih javnih politika i poduzetnici, trebaju biti svjesni digitalne transformacije. Zbog toga trebaju obratiti pozornost na digitalne vještine te osigurati prilike za učenje, kao i okruženje, koje pruža podršku zaposlenicima u stjecanju novih znanja i vještina.*

Ključne riječi*: digitalna ekonomija, digitalne vještine u poduzećima, indeks digitalnog poduzetništva, indeks stvaranja start-up poduzeća*