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Integrating the non-EU immigrants into the EU labour market. An econometric analysis of some of the specific factors

Andreea Florentina NICOLESCU
Bucharest University of Economic Studies, Bucharest, Romania
andreea_nicolescu93@yahoo.com

Gabriela DRĂGAN
Bucharest University of Economic Studies, Bucharest, Romania

Abstract. *The article explores the impact of some specific barriers to the integration of non-EU immigrants on the European Union labour market, measuring the influence of age, level of education and investments on the employment rate of non-EU immigrants. The study is based on a mixed approach, combining a statistically descriptive analysis of the 2008-2018 European labour market trends (in terms of the non-EU immigrants' employment rate) with an econometric evaluation, aiming to measure the influence of investments (in terms of % of Gross fixed capital formation in Gross Domestic Product), age of asylum seekers (in terms of % of total asylum seekers) and level of education of non – EU immigrants (in terms of % of total non – EU immigrants). The analysis highlights the fact that the highest impact of non-EU immigrants on the employment rate is found in the case of non-EU immigrants with age between 18-34 and 35-64 years and with a tertiary level of education. For the other categories of non-EU immigrants, with ages outside the aforementioned range and with a lower level of education, the challenges are even much greater, which indicates the importance of specific educational integration policies, focusing mainly on continuous education and training.*

Keywords: EU labour market, employment, non – EU immigrants, investments, education, age groups.

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Introduction

Migration is a complex phenomenon, influenced by a series of heterogenous factors (economic, social, environmental and political), coming both from the country of origin and destination. From a historical perspective, the EU's economic prosperity and its political stability have represented a permanent attraction force for the third countries immigrants (Eurostat, 2020a). According to Eurostat data (2020b), between 2008-2019, the number of asylum applications within the EU fluctuated significantly. Thus, between 2008 and 2012 the number gradually increased, in 2013 and 2014 the rise accelerated (400,500 applications in 2013, 594,200 in 2014) and reached a pick in 2015 (around 1.3 million) and

2016 (1.2 million) after 2016 the number of asylum application steadily decreased (676,300 asylum seekers in 2019).

With the onset of the refugee crisis in 2015, one of the main challenges for the European countries has been to identify opportunities for the integration of refugees into host countries. Experience in the integration of refugees in recent years has shown that the integration process is often difficult and differs among different categories of immigrants. Behind the personal decision to emigrate there are a multitude of economic and non-economic reasons. On the one hand, people may be determined to emigrate due to the political or economic situation in their country of origin and, on the other hand, immigrants may be attracted to destinations that offer financial stability, better health and education services, etc. (Simpson, 2017).

Integration into the labour market is one of the most important steps towards the socio-economic integration. Access to the host country labour market requires the acquisition of the specific human capital, namely: knowledge of the language, recognition of qualifications and educational level, a legal status, access to education and training. At the same time, the integration of an immigrant on the labour market also means the opportunity to access well-paid jobs (Ivanović-Đukić, et al., 2018), as well as social benefits: unemployment benefits, child raising allowances, pension rights, etc. (Lodovici, 2010). The importance of integrating immigrants into the labour market of host societies lies in their ability to contribute to the labour market, given their skills and knowledge. At the same time, during their integration on the labour market, the immigrants can exercise their language skills and create social contacts (EC, 2017). Also, telework could contribute to a better work–life balance and could also help teleworkers to develop specific teleworking abilities (Dima et al., 2019). Andrei et al. (2020) stated that "improved technological capabilities via broad scientific and technical training as well as learning by doing can contribute, indirectly, to economic growth". Education is a very important component in the integration of immigrants, people with higher levels of education having better job prospect (Ghinea, et al., 2017). Consequently, the impact of education on employment rates fluctuates with the level of the education of immigrants (the higher the education level the better employment prospects) (EC, 2018). Therefore, immigrants with a lower education can be overrepresented in sectors with a high incidence of unskilled jobs and low wages, such as: (i) agriculture; (ii) constructions; (iii) cleaning services; (iv) hotels and restaurants; (v) retail trade (Muller and Beckers, 2018).

On the other hand, Hudson (2016) indicates that a crucial dimension of the migrant's crisis is represented by the gender of people seeking protection in the EU. According to statistics, asylum seekers are mostly young and unaccompanied men looking to integrate into the EU labour market.

Certainly, migration "is influenced by a combination of economic, environmental, political and social factors: either in a migrant's country of origin (push factors) or in the country of destination (pull factors)" (Eurostat, 2020a). Recent studies (Simpson, 2017; Bontenbal and Lillie, 2020; EP, 2020) stated that many of the barriers to the integration of migrants (including refugees and asylum seekers) are similar among the EU countries, respectively: lack of language skills, recognition of qualifications, discrimination, etc. Most of the challenges being the same, policies found successful in one country could also help solving similar issues in other countries. Most of these barriers are close related to the migrant's age and level of education.

According to the *EU Action Plan on the integration of third country nationals* (EC, 2016), the employment, which represents a core part of the non-EU migrant's integration process, could help „to meet the growing needs for specific skills in the EU". *Education and training* are among the most powerful tools for integration and „access to them should be ensured and promoted as early as possible" (EC, 2016). Bileviciute et al. (2019) indicated that "education is inseparable from technological advancement, as well as other factors that can help prepare open, tolerant, creative and well-prepared graduates". In this context, Fonseca et al. (2018) stated that "education addresses sustainable development issues, in the economic, environmental, and social dimensions, contributing to progress and the public good". Substantial analyses recognize the positive link between the level of investments and economic growth (Correa, 1979; Andrei et al., 2017; Roman and Strat, 2018). Any effective integration policy should require „sufficient political, social, and financial *investments*" with positive results for all actors involved in the long run (EC, 2016).

On the other hand, economic structure of host countries is closely linked with the level of employment and income opportunities and decisively influence the size and direction of migratory flows. A recent OECD paper (OECD, 2018b) finds that *ageing* and the ongoing increase in the *share of tertiary-educated workers* are the main factors driving the evolution of the 2030 EU labour force. Using the results of UN population projections, the study points that „if the net migration in 2016-2030 remains similar to what was observed in 2010-2015 (i.e. the baseline scenario), the share of immigrants in the working-age population is set to increase in most countries" (EP, 2020).

In conclusion, access to the labour market remains one of the most important pillars of integration of migrants into the host societies and, on the basis of previous studies, the current research assumed that the employment rate of non-EU immigrants is influenced by factors such as: (i) *age*; (ii) *level of education*; (iii) *level of investments*.

Methodology

The paper investigates the relation between the employment rate of non-EU immigrants and their age and education, on one hand, and the level of private investments in destination countries, on the other hand. The *first hypothesis* under scrutiny is that age and the level of education of non-EU immigrants highly influence the integration of non-EU immigrants on the EU labour market, both factors positively influencing the level of the integration on the EU labour market. The *second hypothesis* is that investments play an important role in the context of labour market integration, the higher the level of private investment, the higher the employment rate of non-EU immigrants in the European destination countries. Coupled with these, the aim of the econometric analysis is to measure the influence of these factors affecting the integration of non-EU immigrants on the EU labour market (age, level of education and level of private investments).

The first part of this research was performed using a statistical analysis aiming to highlight the evolution of employment rate of non-EU immigrants between 2008 and 2018. The concept of "non-EU immigrant" was used according to the definition provided by Eurostat: "persons who are third-country nationals and have established their residence in an EU Member State". (Eurostat, 2020). Both the average employment rate of non-EU immigrants in the period 2008-2018 and the evolution of the employment rate in three

specific moments (2008, reflecting the period before the refugee crisis, 2015, the pick of the refugee crisis, and 2018, the period when asylum applications dropped considerably) are presented in the first section.

The second part of this research is based on a quantitative analysis of the impact of some specific barriers to the integration of non-EU immigrants in the EU labour market, respectively: age, education, investments.

The econometric analysis considers only the asylum seekers active on the labour market, the *age indicator* being split in two groups (i) 18-34 years; (ii) 35-64 years. The division of the age indicator into the aforementioned groups meant to identify the active age group with higher influence on the employment rate of non-EU immigrants.

At the same time, the *level of education* included in the estimated models corresponds to the categories: ISCED 0-2 (primary level of education); ISCED 3-4 (secondary level of education); ISCED 5-8 (tertiary level of education). The third indicator included in the analyses are *investments* (gross fixed capital formation). It is worth mentioning that all the indicators used as independent variables were expressed as a percentage (share of asylum seekers of total asylum seekers, share of non-EU immigrants with a level of education in total non-EU immigrants and share of gross fixed capital formation in GDP). Therefore, the chosen independent variables were age, level of education of non-EU immigrants, the level of investments (Gross Capital Formation) and the dependent variable is the employment rate of non-EU immigrants (see Table 1.).

The European Member States considered in these analyses were those countries that received the most asylum applications between 2015 and 2018, namely DE, IT, FR, SE, HU, GR, AT, UK, ES, NL, BE, FI and DK. UK was included in the analysis (even though it is no longer part of EU), in order to accurately reflect the situation between 2008-2018.

Impact assessment was estimated for the period 2008-2018, using Eurostat panel data with annual frequency. Following the adjustments made, a number of six econometric models and 130 observations resulted.

The table below shows the variables included in the six models.

Table 1. The variables used in the six estimated models

Independent variables				
Model 1	Autoregressive term	Share of asylum seekers aged 18-34 in total asylum seekers (% of total asylum seekers)	Share of non-EU immigrants with a level of education in ISCED 0-2 in total non-EU immigrants (% of total non-EU immigrants)	Gross fixed capital formation (% of GDP)
Model 2	Autoregressive term	Share of asylum seekers aged 35-64 in total asylum seekers (% of total asylum seekers)	Share of non-EU immigrants with a level of education in ISCED 0-2 in total non-EU immigrants (% of total non-EU immigrants)	Gross fixed capital formation (% of GDP)
Model 3	Autoregressive term	Share of asylum seekers aged 18-34 in total asylum seekers (% of total asylum seekers)	Share of non-EU immigrants with an education level in ISCED category 3 - 4 in total non-EU immigrants (% of total non-EU immigrants)	Gross fixed capital formation (% of GDP)
Model 4	Autoregressive term	Share of asylum seekers aged 35-64	Share of non-EU immigrants with an education level in	Gross fixed capital formation (% of

		in total asylum seekers (% of total asylum seekers)	ISCED category 3 - 4 in total non-EU immigrants (% of total non-EU immigrants)	GDP)
Model 5	Autoregressive term	Share of asylum seekers aged 18-34 in total asylum seekers (% of total asylum seekers)	Share of non-EU immigrants with a level of education in ISCED category 5 - 8 in total non-EU immigrants (% of total non-EU immigrants)	Gross fixed capital formation (% of GDP)
Model 6	Autoregressive term	Share of asylum seekers aged 35-64 in total asylum seekers (% of total asylum seekers)	Share of non-EU immigrants with a level of education in ISCED category 5 - 8 in total non-EU immigrants (% of total non-EU immigrants)	Gross fixed capital formation (% of GDP)
Dependent variable For all six models the dependent variable used is the employment rate of non-EU immigrants				
Definition of variables		The employment rate is the percentage of employed persons in relation to the comparable total population (Eurostat, „Glossary:Employment rate"). In this research was used the employment rate of non-EU immigrants, which is calculated as the share of employed foreign-born persons aged 15-64 in the total foreign-born population (active and inactive persons) of that same age (OECD, „Foreign-born employment").		
		The asylum seeker is a person looking for international protection because of the persecution or injury they suffered in their country of origin. Every refugee is initially an asylum seeker, but not all asylum seekers are ultimately recognized as refugees. While waiting for the decision of acceptance/rejection of the asylum application, these people are called "asylum seekers" (UNHCR, 2016).		
		Non-EU immigrants are defined as third-country nationals who have established their residence in an EU Member State (Eurostat, 2020a).		
		Gross fixed capital formation – investments (GFCF) consists of resident producers´ acquisitions, less disposals, of fixed tangible or intangible assets (Eurostat,2020c).		

Source: made by the authors based on estimated model

Using the described methdology, we have estimated the following equations:

(1) $empl_{it} = \alpha_0 + \alpha_1 empl(-1)_{it} + \alpha_2 age18-34_{it} + \alpha_3 ISCED0-2_{it} + \alpha_4 GFCF_{it} + b_1 dummy_1 + b_2 \text{dummy}_2 + b_3 dummy_3 + b_4 dummy_4 + b_5 dummy_5 + \ldots b_{12} dummy_{12} + \varepsilon_{t1}$

(2) $empl_{it} = \beta_0 + \beta_1 empl(-1)_{it} + \beta_2 age35-64_{it} + \beta_3 ISCED0-2_{it} + \beta_4 GFCF_{it} + b_1 dummy_1 + b_2 \text{dummy}_2 + b_3 dummy_3 + b_4 dummy_4 + b_5 dummy_5 + \ldots b_{12} dummy_{12} + \varepsilon_{t2}$

(3) $empl_{it} = \gamma_0 + \gamma_1 empl(-1)_{it} + \gamma_2 age18-34_{it} + \gamma_3 ISCED3-4_{it} + \gamma_4 GFCF_{it} + b_1 dummy_1 + b_2 \text{dummy}_2 + b_3 dummy_3 + b_4 dummy_4 + b_5 dummy_5 + \ldots b_{12} dummy_{12} + \varepsilon_{t3}$

(4) $empl_{it} = \delta_0 + \delta_1 empl(-1)_{it} + \delta_2 age35-64_{it} + \delta_3 ISCED3-4_{it} + \delta_4 GFCF_{it} + b_1 dummy_1 + b_2 \text{dummy}_2 + b_3 dummy_3 + b_4 dummy_4 + b_5 dummy_5 + \ldots b_{12} dummy_{12} + \varepsilon_{t4}$

(5) $empl_{it} = \pi_0 + \pi_1 empl(-1)_{it} + \pi_2 age18-34_{it} + \pi_3 ISCED5-8_{it} + \pi_4 GFCF_{it} + b_1 dummy_1 + b_2 \text{dummy}_2 + b_3 dummy_3 + b_4 dummy_4 + b_5 dummy_5 + \ldots b_{12} dummy_{12} + \varepsilon_{t5}$

(6) $empl_{it} = \rho_0 + \rho_1 empl(-1)_{it} + \rho_2 age35-64_{it} + \rho_3 ISCED5-8_{it} + \rho_4 GFCF_{it} + b_1 dummy_1 + b_2 \text{dummy}_2 + b_3 dummy_3 + b_4 dummy_4 + b_5 dummy_5 + \ldots b_{12} dummy_{12} + \varepsilon_{t6}$

where:

- ✓ empl = employment rate of non-EU immigrants – Eurostat
- ✓ *i* = number of countries and *t* = time period;

- ✓ ε_{t1-6} = error term;
- ✓ $\alpha_0;\ \beta_0;\ \gamma_0;\ \delta_0;\ \pi_0;\ \rho_0$ = the coefficients of the intercept;
- ✓ $\alpha_{1-4}; \beta_{1-4}; \gamma_{1-4}; \delta_{1-4}; \pi_{1-4}; \rho_{1-4}$ = the LSDV estimators for each exogenous variable;
- ✓ b_{1-12} = the intercept for each cross-section;
- ✓ $dummy$ = a binary variable for each cross-section, excepting the last one;
- ✓ age18-34 = share of asylum seekers aged 18-34 in total asylum seekers (% of total asylum seekers) – Eurostat
- ✓ age35-64 = share of asylum seekers aged 35-64 in total asylum seekers (% of total asylum seekers) – Eurostat
- ✓ ISCED0-2 = Share of non-EU immigrants with a level of education in ISCED 0-2 in total non-EU immigrants (% of total non-EU immigrants) – Eurostat
- ✓ ISCED3-4 = Share of non-EU immigrants with an education level in ISCED 3 - 4 in total non-EU immigrants (% of total non-EU immigrants) – Eurostat
- ✓ ISCED5-8 = Share of non-EU immigrants with a level of education in ISCED 5 - 8 in total non-EU immigrants (% of total non-EU immigrants) – Eurostat
- ✓ GFCF = Gross fixed capital formation (% of GDP) – Eurostat

It should be noted that the operations were performed using the statistical program Eviews 9.0. Before identifying the estimation method, the stationarity of the data used was analysed through the Summary window and the Schwarz information criterion. Given that all the panel series used proved to be stationary at the initial level and at the first difference, a autoregressive term was introduced in the models in order to correct possible inconveniences.

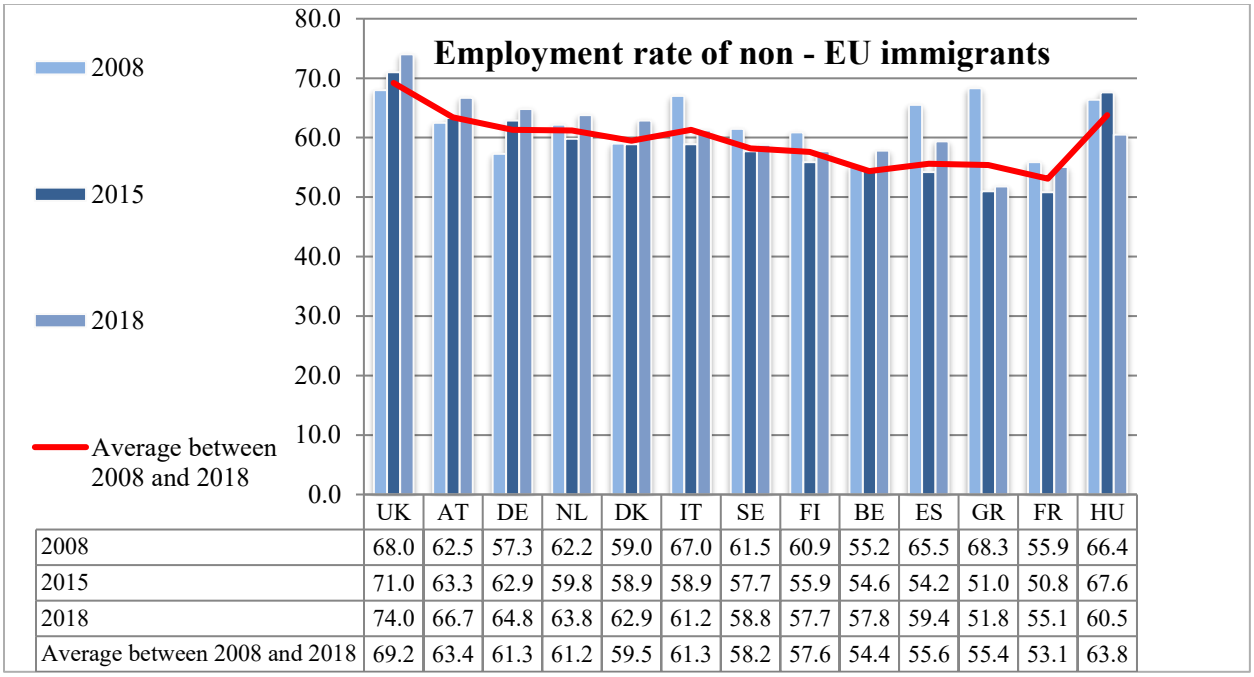
The impact was estimated using the Panel Least Squares method, adjusted with fixed effects, to take into account the existence of heterogeneity in cross sections, but also considering the result of the Redundant Fixed Effects Test - Likelihood Ratio (it tests the compatibility of the model with the method). Therefore, the weighting method of the Cross-section weights equation was used, in order to reduce the risk of heteroskedasticity and autocorrelation. At the same time, the method of estimating the covariance of White cross-section coefficients was used in order to improve the robustness of standard coefficient errors. In the context of validating the plausibility of the models, the following hypotheses were tested: (i) the absence of cross section dependence (Breusch-Pagan LM; Pesaran scaled LM; Bias-corrected scaled LM; Pesaran CD); (ii) normal residue distribution (Jarque-Bera test); (iii) the absence of multicollinearity; (iv) the significance of the parameters; (v) the statistical validity of the models.

In the first phase, the stationarity was checked using the Summary window, which aims to provide details on the test results that verify the stationarity of the variables used. Thus, the Schwarz information criterion was used in order to select the optimal lag. The following tests were performed through the Summary window: (i) The process that uses a common unit root (Levin, Lin & Chu t *; Breitung t-stat); (ii) The process that takes into account an individual unitary root (Im, Pesaran și Shin W-stat; ADF - Fisher Chi-square; PP - Fisher Chi-square).

Employment of the non-EU immigrants in the European Union in the period 2008-2018

The labour market is defined as consisting of labour supply of the population and labour demand of enterprises and other production units (EC, "Glossary"). Labour market participation is the most important step towards successful integration of migrants into host societies. In fact, any positive macroeconomic impact can only be achieved if immigrants are well integrated into the labour market, which requires important investments to facilitate their access to employment. Also, the labour market integration represents a multi-stage process, which involves many actors, at different levels (EP, 2016).

In the following section, both the average employment rate of non-EU immigrants in the period 2008-2018 and the evolution of the employment rate in three relevant years (2008, 2015 and 2018) are analysed.



	UK	AT	DE	NL	DK	IT	SE	FI	BE	ES	GR	FR	HU
2008	68.0	62.5	57.3	62.2	59.0	67.0	61.5	60.9	55.2	65.5	68.3	55.9	66.4
2015	71.0	63.3	62.9	59.8	58.9	58.9	57.7	55.9	54.6	54.2	51.0	50.8	67.6
2018	74.0	66.7	64.8	63.8	62.9	61.2	58.8	57.7	57.8	59.4	51.8	55.1	60.5
Average between 2008 and 2018	69.2	63.4	61.3	61.2	59.5	61.3	58.2	57.6	54.4	55.6	55.4	53.1	63.8

Figure 1. Employment rate of non – EU immigrants between 2008 and 2018

Source: made by the authors based on data taken from the Eurostat platform

When referring to the integration into the labour market, the remuneration received by an employee (which must be proportionate to the type of activity performed and provide the chance for a decent living), remains essential for the decision of non-EU immigrants to settle in one specific country. Thus, those states with a high employment rate of non-EU immigrants are also countries that provide social assistance, including financial benefits, which allows new arrivals to adapt and facilitate their integration into the labour market. However, having into account the recent findings, non-EU immigrants are more likely to be employed in vulnerable positions, for example on fixed-term contracts, which present the risk not be renewed in the event of any economic and technological shocks (Barslund, et al., 2018).

Figure 1. highlights the average employment rate of non-EU immigrants between 2008 and 2018 in the scrutinized European states. Thus, United Kingdom is the state with the highest employment average rate of immigrants from outside the European (69.2%), followed by Hungary (63.8%) and Austria (63.4%). The lowest employment rate of non-EU immigrants could be identified in France (53.1%), the difference between United Kingdom and France being significant (16.1 pp).

The comparison among the evolution of the employment rate of non-EU immigrants in specific years (2008, 2015 and 2018) was based on the assumption that the influx of refugees is positively related to an increase of the employment rate of non-EU immigrants. In 2015 compared to 2008, the employment rate of non-EU immigrants decreased in almost all selected EU Member States, mainly because of the economic recession that began in 2008 and which had negative effects on the employment rate, including those of non-EU immigrants. If we relate the year 2018 to 2015, the employment rate of non - EU immigrants decreased only in Hungary, given the HU 's decision to close the borders and stop the entry of refugees into its territory. The highest employment rate of non-EU immigrants was registered in Great Britain (an increase of 3 pp in 2018 compared to 2015).

The highest increase in the employment rate in 2018 compared to 2015 was recorded in Spain (5.2 pp), followed by France (4.3 pp), respectively the Netherlands and Denmark (4 pp). At the opposite side is Hungary, where the employment rate of non-EU immigrants decreased in 2018 compared to 2015 by 7.1 pp as a result of the decision to raise iron gates at the borders and stop the influx of refugees on its territory.

Impact of independent variables (age, level of education, gross fixed capital formation) on employment rate of non - EU immigrants in the selected EU Member States

This section presents the results of the estimated econometric models measuring the impact of independent variables, investments (in terms of % of Gross fixed capital formation in GDP), age of asylum seekers (in terms of % of total asylum seekers) and level of education of non - EU immigrants (in terms of % of total non-EU immigrants) on the dependent variable which is the employment rate of non - EU immigrants, in the period 2008-2018.

Table 2. shows the coefficients of the independent variables and results of used tests aiming to demonstrate the plausibility of the estimators (most coefficients are significant at 1%).

Table 2. Impact of independent variables on the dependent variable of non-EU immigrants

Dependent variable - employment rate of Non - EU immigrants						
Standard coefficient / error/ probability of coefficient	**MODEL 1**	**MODEL 2**	**MODEL 3**	**MODEL 4**	**MODEL 5**	**MODEL 6**
Employment rate (-1) autoregressive term	0.397301* (0.397301) p - 0.0000	0.396688* (0.046566) p - 0.0000	0.400021* (0.048308) p - 0.0000	0.387221* (0.050229) p - 0.0000	0.427852* (0.047264) p - 0.0000	0.415507* (0.049785) p - 0.0000
Independent variable -	0.048977*** (0.025051)	0.039837 (0.026584)	0.040908** (0.017538)	0.043722*** (0.026302)	0.048591** (0.021312)	0.049368 (0.030362)

age	p - 0.0530	p - 0.1368	p - 0.0214	p - 0.0992	p - 0.0245	p - 0.1067
Independent variable - level of education	-0.107872** (0.050734) p - 0.0357	-0.110363** (0.053639) p - 0.0419	-0.085559* (0.026706) p - 0.0018	-0.091846* (0.027194) p - 0.0010	0.143296* (0.043337) p - 0.0013	0.147276* (0.043885) p - 0.0011
Independent variable - investments	0.829752* (0.104224) p - 0.0000	0.819123* (0.106063) p - 0.0000	0.797021* (0.114367) p - 0.0000	0.792120* (0.115632) p - 0.0000	0.685343* (0.131824) p - 0.0000	0.676475* (0.132515) p - 0.0000
Constant	22.66123	23.07420	22.22445	23.29267	16.00265	16.80861
Observations	130	130	130	130	130	130
R – squared	0.941525	0.938842	0.938371	0.935899	0.945410	0.943599
Prob (F-statistic)	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Redundant Fixed Effects Test – Likelihood Ratio	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cross – section dependence test (Breusch – Pagan)	0.0279	0.0238	0.0001	0.0001	0.0078	0.0091
Cross – section dependence test (Pesaran scaled)	0.3126	0.2747	0.0008	0.0008	0.1028	0.1177
Cross – section dependence test (Bias – corrected scaled)	0.7737	0.7114	0.0083	0.0087	0.3632	0.3997
Cross – section dependence test (Pesaran)	0.2156	0.2029	0.0125	0.0152	0.5877	0.5826
Jarque–Bera	0.162403	0.154721	0.232801	0.287137	0.201718	0.231123
*Note: Significant coefficients at 1% are marked with *, at 5% are marked with **, and at 10% with *** The standard error is noted in parentheses and the probability of the coefficient is noted with p.*						

Source: authors processing using Eviews 9.0

The results of the econometric models were interpreted using the ceteris paribus principle in which all the variables of a situation are kept constant, except the one whose influence is to be studied. In this case, the impact of age variable on the dependent variable (employment rate of non - EU immigrants) is slightly different in these models, since it may be affected by the cross-section dependence in some cases. In econometrics, when adding/replacing some variables, years or cross-sections, the coefficients may differ, but

the best way forward is choosing the models with a maximum verisimilitude of the estimators, which can be validated by the hypotheses already tested in this study.

Model I - Analysis of the employment determinants of non-EU immigrants

According to Eviews results, when the percentage of asylum seekers aged *18-34* in total asylum seekers is increased by one pp, the employment rate of non-EU immigrants increases by about *0.049 pp*. This is due to the fact that young refugees with a lower level of education are preferred by the employers in the EU countries analysed, as jobs targeted by young refugees with a lower level of training who do not show extensive previous experience are employed mainly in areas such as construction, agriculture, etc., which do not require prior training. At the same time, in the areas mentioned above, salaries are low, which leads to a low interest of the citizens of the analysed states, these vacancies being filled by immigrants. This can also be a risk if jobs requiring a lower level of education are occupied by a very large proportion of immigrants, as this could lead to a widening of the socio-economic gap between them and the local population.

If the rate of immigrants from outside the EU with a level of education corresponding to *ISCED category 0-2* is increased by one pp, the employment rate will decrease by about *0.108 pp*. In this context, it is necessary to increase the level of education of immigrants by strengthening and expanding the capacity of education systems in host countries to adapt to the educational needs of immigrants from outside the EU. This would lead to an early training of non-EU immigrants, who would have more chances to integrate into the labour market. On the other hand, strengthening and expanding the capacity of education systems in host states would lead to improved education services for both their own citizens and also for immigrants, thereby promoting social cohesion and tolerance towards people from different backgrounds and cultures.

The largest impact on the employment rate of non-EU immigrants is found in *private investments*, which is around *0.830 pp*. This indicates that private investments has a high impact on the employment rate of non-EU immigrants.

At the same time, the increase by one pp of the employment rate of non-EU immigrants registered in the *previous year*, leads to the increase by *0.397 pp* of the employment rate of non-EU immigrants in the *current year*. This indicates that the experience of integrating a immigrant into the labour market may lead to the attraction of other immigrants in the countries analysed, as a result of sharing their experience with friends and relatives, who may decide after consultation with integrated immigrants to address the same strategy on integration. At the same time, the reunification of the family can lead to the attraction of the young labour force in the analysed states.

Model II - Analysis of the determinants of employment of non-EU immigrants

According to Eviews results, when the percentage of asylum seekers aged *35-64* in total asylum seekers increases by one percentage point, the employment rate of non-EU immigrants increases by *0.040 pp*. The difference identified in the first two models is that non-EU immigrants between the ages of 18 and 34 with a lower qualification have a higher influence on the employment rate, compared to the age category 35 - 64, due to the fact that for jobs that does not require high qualifications, very young people are preferred, who generally work in areas that require physical strength, such as: construction,

manufacturing, agriculture, car repairs, accommodation and food services, cleaning services, etc.

If the rate of non-EU immigrants with a level of education corresponding to *ISCED category 0-2* is increased by one pp, their employment rate decreases by about *0.110 pp*. Also, the impact of *private investments* on the employment rate is about *0.820 pp*. Similar to the previous model, the increase by one pp in the employment rate of non - EU immigrants recorded in the *previous year*, led to the increase by *0.397 pp* in the employment rate of non - EU immigrants in the *current year*.

Model III - Analysis of the employment determinants of non-EU immigrants

According to Eviews results, when the percentage of asylum seekers aged *18-34* in total asylum seekers increases by one percentage point, the employment rate of non-EU immigrants increases about *0.041 pp*. In the case of those who have a level of education corresponding to *ISCED category 3-4*, their employment rate decreases by about *0.096 pp* when the employment rate of non-EU immigrants increases by one percentage point. As for the impact of *private investments*, the impact is about *0.870 pp* on the non-EU immigrants employment rate. At the same time, the increase by one pp in the employment rate of non-EU immigrants registered in the *previous year*, led to the increase by *0.400 pp* of the employment rate of non-EU immigrants in the *current year*.

Model IV - Analysis of the determinants of employment of non-EU immigrants

According to Eviews, when the percentage of asylum seekers aged *35-64* in total asylum seekers increases by one percentage point, the employment rate of non-EU immigrants increases by *0.049 pp*. Compared to the previous model, the impact is higher for non-EU immigrants aged 35-64 with a secondary level of education, given that they have more experience in the labour market, acquired in the country of origin, compared with the youngest.

If the rate of immigrants from outside the EU who have a level of education corresponding to *ISCED category 3-4* is increased by one pp, the employment rate of non-EU immigrants decreases by approximately *0.092 pp*. Regarding the impact of *private investments* on employment, it is about *0.821 pp*, which is lower compared to the previous model. At the same time, the increase by one pp of the employment rate of non - EU immigrants registered in the *previous year*, led to the increase by *0.387 pp* of the employment rate of non-EU immigrants in the *current year*. In this context, compared to the previous model, the impact in the case of model IV is lower compared to that resulting in model III.

Model V - Analysis of the determinants of employment of non-EU immigrants

According to Eviews results, when the percentage of asylum seekers aged *18-34* in total asylum seekers increases by one percentage point, the employment rate of non-EU immigrants increases by *0.041 pp*. If the rate of non-EU immigrants with an education level corresponding to *ISCED category 5-8* is increased by one pp, the employment rate will increase by approximately *0.143 pp*. In this context, support for non-EU immigrants wishing to pursue university studies to prepare educationally for the purpose of easier integration into the labour market is essential.

In terms of *private investments*, the impact on the employment rate of non-EU immigrants is about *0.693 pp*, a higher impact than in the model VI. At the same time, the increase by one pp of the employment rate of non-EU immigrants registered in the *previous year*, led to the increase by *0.428 pp* of the employment rate of non-EU immigrants in the *current year*. In this sense, the coefficient recorded by those aged 18-34 is higher compared to that of the 35-64 age group, given that young people tend to take more into account the experience shared by those who have managed to enter the labour market before them.

Model VI - Analysis of the determinants of employment of non-EU immigrants

According to Eviews results, when the percentage of asylum seekers aged *35-64* in total asylum seekers increases by one percentage point, the employment rate of non-EU immigrants increases by *0.049 pp*. In the case of increasing by one pp the rate of non - EU immigrants who have a level of education corresponding to *ISCED category 5-8*, their employment rate increases by about *0.147 pp*. The difference identified in models V-VI is that people aged 18 to 34 who have a higher qualification have a less influence on the employment rate, compared to the age category 35-64, due to the fact that those who have a higher qualification have more experience in their fields of activity, which leads to a greater opening of the labour market for them.

Regarding the *private investments*, they have an impact on the employment rate of approximately *0.676 pp*, this being the lowest impact of investments recorded of all estimated models. At the same time, the increase by one pp of the employment rate of non-EU immigrants registered in the *previous year*, led to the increase by *0.416 pp* of the employment rate of non-EU immigrants in the *current year*.

Common results of the six econometric models

Regarding the absence of the cross-sectional dependence, the results associated with the tests performed in the models showed probabilities of more than 5% (acceptance of the null hypothesis that there is no dependence between cross-sections), except for the Breusch-Pagan LM test.

Following the assessment we performed, at least 50% +1 of the results of cross-section dependence tests confirm the absence of this hypothesis in models I, II, V, VI, while being found in models III and IV. At the same time, the significance of the coefficients had been tested in order to select the most suitable models. Thus, it was found that the variable regarding the age category 18-34 years is significant at 5% in model V, which demonstrates a high confidence in this estimator, while in the case of model VI, the variable related to the age category 35-64 years has a high degree of uncertainty, as the coefficient is not significant at 10%. Therefore, the degree of confidence in this estimator is approximately 90%. Thus, the estimator of the variable that captures the age group 35-64 years is more appropriate than the coefficients calculated in models II and IV, given the higher degree of uncertainty in the case of model II and the presence of cross-section dependence in the case of model IV. Although in the research, most coefficients are significant at 1%, the indicator for the 35-64 age group is not significant at a threshold of 10%, in the case of models II and VI. At the same time, regarding the secondary level of education, the significance related to the variables included in models III and IV were over 5%, which indicates a low confidence in both models. Also, given the cross-section dependence test

results and the probabilities of the coefficients, the greatest confidence can be found in models V and VI.

Regarding the Jarque - Bera test, the result in the six models is higher than 5%, which made it possible to accept the null hypothesis that the residues are normally distributed. In view of the above, the validation of the assumptions has largely demonstrated the likelihood of the estimators, which means that the estimated models can be trusted. At the same time, the correlation coefficients were below the coefficient of determination in the case of each model, which confirms the absence of multicollinearity.

Also, for all models, R-squared shows that independent variables explain 94% of the evolution of the employment rate, except for model V, where R-squared shows that independent variables explain 95% of the evolution of the employment rate.

The econometric analysis showed that, *in terms of age and education factors* (first and second independent variable), the greatest impact on the employment rate of non-EU immigrants was found for migrants with tertiary level of education, aged between 35 years and 64 years. This result confirms *the first working hypothesis* of the study, according to which the education and age of immigrants from outside the EU influence the employment rate in the host countries. Therefore, this finding indicates the importance of the education policies (in particular, lifelong learning policies) in the integration of the non-EU immigrants in host countries. As different previous research showed, a higher level of education ensures an easier integration into the labour market of the European host countries (EC, 2016, 2017, 2018; EP, 2016, 2020; OECD, 2018b). Münz (2008) made an interesting observation showing that immigrants from outside the EU with a high level of education tend to be overrepresented in host European countries compared to immigrants from EU Member States. However, policies on the importance of higher education in the integration of the non-EU immigrants and the inclusion of immigrants in the tertiary learning programs are still insufficiently addressed in the literature (Bonin, 2017).

Also, the econometric analysis showed that *the investment factor* (the third independent variable) has the most significant impact on the employment rate of non-EU immigrants. This result validates *the second working hypothesis* that investment plays an important role in the context of labour market integration in the EU. As also highlighted other authors, this outcome confirms the role of investment in the integration of non-EU immigrants into the EU labor market. Thus, as literature emphasized (OECD and ILO, 2018a; EC, 2016, 2018; EP, 2020; Subic, 2010), any effective integration policy should require appropriate financial investments with positive results in the long run in increasing employment capacity for all actors from the destination countries involved.

The main findings of this paper have to be seen in light of *some research limitations*. For instance, given the models III and IV (which consider the level of secondary education), a low confidence was revealed by cross-sectional dependence tests. However, both models were included in the research in order to present the impact of all levels of education on the employment of the non-EU immigrants. Moreover, regarding the significance of coefficients, for the model II (asylum seekers aged 35-64 years), respectively, the model VI (asylum seekers aged 35-64 years), the coefficients of the indicators mentioned in parentheses might not be considered as significant (the degree of significance is over 10%). Regarding data collection, at the time of the research, data on the age of non-EU immigrants were not available and, given that refugees represent a significant category of non-EU immigrants, data on asylum seekers age were used.

Future research intends to address all of the above limitations and to develop the main findings of the study into two new directions: (i) including in the analysis other independent variables relevant to the employment rate of the non-EU immigrants on the EU labour market (such as the gender of the non-EU immigrants, country of origin of non-EU immigrants, etc.); (ii) conducting a comparative analysis between factors influencing the employment rates of non-EU immigrants and employment rates of the EU Member States immigrants.

Conclusions

The paper has focused on the relation between the employment rate of non-EU immigrants and main factors aiming to facilitate their integration on the EU labour market, respectively: (i) age; (ii) level of education; (iii) level of investments. The main findings of the paper have confirmed the working hypothesis of the research, according to which the employment rate of non-EU immigrants is directly influenced, on the one hand, by the age and level of education of immigrants, and, on the other hand, by the level of investments in the destination countries.

Accordingly, the econometric analysis showed that investments have the most important impact on the employment rate of non-EU immigrants, cumulating the highest coefficient of all the variables analysed (especially, for non-EU immigrants with a low education level, aged between 18 and 34 years). At the same time, in terms of education, the analysis highlights the fact that the highest impact of non-EU immigrants on the employment rate is found in the case of non-EU immigrants with a tertiary level of education, especially for asylum seekers with age between 35 and 64 years. This indicates the importance of education policies in the process of integration into the labour market of immigrants from non-EU countries. Also, in the context of asylum seekers aged between 18 and 34 years and a tertiary level of education (model V) the increase by one pp in the employment rate of non-EU immigrants recorded in the previous year, led to the registration of the higher coefficient of the employment rate for non - EU immigrants in the current year, compared to the other five estimated models. In this context, the opportunities for integration into the labour market of the aforementioned category of immigrants are much higher, compared to non-EU immigrants from another age group, respectively level of education, given that young people with a higher education tends to consider more the experience shared by those who have managed to integrate into the labour market before them. In case of age variable, impacts estimated in model V and VI presented a great level of confidence.

Given the main findings of this research, which are in line with economic literature previously highlighted in the paper (OECD, 2018b; EC, 2018; EP, 2020; Bontenbal and Lillie, 2020), mixed policies, managed both at the EU level and national level are mostly needed. As various official reports published by the EU institutions and different authors have already pointed out (EC, 2016; EP, 2020; Bonin, 2017; Banociova and Martinkova 2017), these active integration policies should mainly focus on investments able to integrate non-EU immigrants in the European countries labour markets, facilitate access to education (but also the recognition of the previous trainings made in the countries of origin) and promote specific dedicated supporting programmes for active immigrants (18-34 years and 35-64 years) with a tertiary level of education. For the other categories of non-EU

immigrants, with ages outside the aforementioned range and with a lower level of education, the challenges are even much greater, which indicates the importance of specific educational integration policies, focusing mainly on continuous education and training.

References

Andrei, J. V., Mieila, M., Panait, M. (2017). The impact and determinants of the energy paradigm on economic growth in European Union. *PloS one*, 12(3). Retrieved from https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0173282

Andrei, J. V., Popescu, G. H., Nica, E., Chivu, L. (2020). The impact of agricultural performance on foreign trade concentration and competitiveness: empirical evidence from Romanian agriculture. *Journal of Business Economics and Management*, 21(2), 317-343, DOI: https://doi.org/10.3846/jbem.2020.11988

Banociova A., Martinkova S. (2017). Active Labour Market Policies of Selected European Countries and Their Competitiveness. *Journal of Competitiveness*, 9(3), 5-21. Retrieved from https://www.cjournal.cz/index.php?hid=clanek&bid=archiv&cid=254&cp=

Barslund, M., Di Salvo, M., Laurentsyeva, N. (2018). The impact of refugees on the labour market: a big splash in a small pond?. *CEPS*. Retrieved from https://www.ceps.eu/ceps-publications/impact-refugees-labour-market-big-splash-small-pond/

Bileviciute, E., Draksas, R., Nevera, A., Vainiute, M. (2019). Competitiveness in Higher Education: The Case of University Management. *Journal of Competitiveness*, 11(4), 5–21. https://doi.org/10.7441/ joc.2019.04.01. Retrieved from https://www.cjournal.cz/files/342.pdf

Bonin, H. (2017). The Potential Economic Benefits of Education of Migrants in the EU. *European Commission*. Retrieved from https://eric.ed.gov/?id=ED574042

Bontenbal, I., Lillie, N. (2020). Integration of Migrants, Refugees and Asylum Seekers: Policy Barriers and Enablers SIRIUS WP3 integrated report. *SIRUS*. Retrieved from https://www.sirius-project.eu/sites/default/files/attachments/WP3%20Integrated%20report%20D3.2.pdf

Correa, H. (1979). Employment, factor income distribution, and economic growth: Theory and planning. *Empirical Economics 4*, 247–279. https://doi.org/10.1007/BF01764296

Dima, AM (Dima, Alina-Mihaela); Tuclea, CE (Tuclea, Claudia-Elena; Vranceanu, DM (Vranceanu, Diana-Maria) ; Tigu, G (Tigu, Gabriela), Sustainable Social and Individual Implications of Telework: A New Insight into the Romanian Labor Market, Sustainability, Volume: 11, Issue: 13, Article Number: 3506 , Published: JUL 1 2019.

European Commission (EC). Glossary. Retrieved from https://ec.europa.eu/immigration/glossary_en#top

European Commission (EC) (2016). Action Plan on the integration of third countries nationals. *COM(2016) 377 final*. Retrieved from https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/policies/european-agenda-migration/proposal-implementation-

package/docs/20160607/communication_action_plan_integration_third-country_nationals_en.pdf

European Commission (EC) (2017). Peer Review on 'Integration of Refugees into the Labour Market. Retrieved from https://ec.europa.eu/social/main.jsp?langId=en&catId=1274&furtherNews=yes&newsId=9009

European Commission (EC) (2018). Integration of immigrants in the labour market: assessing the employment gaps*. Retrieved from https://publications.jrc.ec.europa.eu/repository/bitstream/JRC111270/policy_brief_employment_gap_online_june_final.pdf

European Parliament (EP)(2016). Labour Market Integration of Refugees: Strategies and good practices. Retrieved from https://www.europarl.europa.eu/RegData/etudes/STUD/2016/578956/IPOL_STU(2016)578956_EN.pdf

European Parliament (EP) (2020). New avenues for legal and labour migration Selected and commented bibliography of research since 2015. Retrieved from https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/649576/IPOL_IDA(2020)649576_EN.pdf

Eurostat. Glossary:Employment rate.Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Employment_rate

Eurostat (2020a). Migration and migrant population statistics. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Migration_and_migrant_population_statistics

Eurostat (2020b). Asylum quarterly report. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/pdfscache/13562.pdf

Eurostat (2020c). Gross fixed capital formation (investments). Retrieved from https://ec.europa.eu/eurostat/en/web/products-datasets/-/TEC00011

Fonseca, L.M., Portela, A.R., Duarte, B., Queirós, J. and Paiva, L. (2018), "Mapping higher education for sustainable development in Portugal", *Management & Marketing. Challenges for the Knowledge Society*, Vol., 13, No 3, pp. 1064-1075, DOI: https://doi.org/10.2478/mmcks-2018-0023

Hudson, V. (2016). Europe's Man Problem. Migrants to Europe skew heavily male – and that's dangerous. *Politico*. Retrieved from https://www.politico.eu/article/europes-man-problem/

Ghinea, V., M., Dima, A., M. & Hadad, S. (2017). Excellence Model for Sustainable Convergence in the EU Higher Education. Amfiteatru Economic, 19(Special No. 11), 1107-1122

Ivanović-Đukić, M., Đorđević, B., & Lepojević, V. (2018). Mediating effects of educational level on job related characteristics: Job satisfaction relationship. Strategic Management, 23(2), 13–21. https://doi.org/10.5937/StraMan1802013I

Lodovici, M. (2010). Making a success of integrating immigrants in the labour market. Retrieved from https://ec.europa.eu/social/main.jsp?catId=1024&langId=en&newsId=1422&moreDocuments=yes&tableName=news

Muller, J., Beckers, P. (2018). From skills to work: guidelines for designing policies to strengthen labour market integration of refugees in the EU. *Skills2Work*, Retrieved from https://slovenia.iom.int/sites/default/files/documents/Guidelines%20S2W.pdf

Münz, R. (2008). Migration, Labor Markets, and Integration of Migrants: An Overview for Europe. *Social Protection & Labour The World Bank.*

Organisation for Economic Co-operation and Development (OECD). Foreign-born employment. Retrieved from https://data.oecd.org/migration/foreign-born-employment.htm

Organisation for Economic Co-operation and Development, International Labour Organization (OECD, ILO) (2018a). How Immigrants Contribute to Developing Countries' Economies. *OECD Publishing.* Retrieved from https://www.oecd-ilibrary.org/docserver/9789264288737-en.pdf?expires=1599312817&id=id&accname=guest&checksum=147137E0670ED00398206847DB6B536C

Organisation for Economic Co-operation and Development (OECD) (2018b). Assessing the role of migration in European labour force growth by 2030, Social, Employment and Migration Working Papers No. 204. Retrieved from https://www.oecd-ilibrary.org/docserver/6953a8ba-en.pdf?expires=1599234529&id=id&accname=guest&checksum=3A3471F3BB5855ABC0B96E8C7226BE4B

Roman, M., Strat, V. A. (2018). Romanian immigrants and the inflows of foreign direct investment towards Romania, *Management & Marketing. Challenges for Knowledge Society*, december 2018, DOI: https://doi.org/10.2478/mmcks-2018-0033

Simpson, N. (2017). Demographic and economic determinants of migration. *IZA World of Labor*. Retrieved from https://wol.iza.org/articles/demographic-and-economic-determinants-of-migration/long

Subic, J., Vasiljevic, Z., Andrei, J. (2010). The impact of FDI on the European economic development in the context of diversification of capital flows. *Proceedings of the 14th International Business Information Management Association, Business Transformation through Innovation and Knowledge Management: An Academic Perspective*, Istanbul, Turkey.

The UN Refugee Agency (UNHCR) (2016). Asylum-seekers – Seeking international protection. Retrieved from https://www.unhcr.org/ceu/86-enwho-we-helpasylum-seekers-html.html