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# **Internationalization of the higher education in Romania and EU countries**

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## **Abstract**

Internationalization of higher education has become a part of the globalization process. In this paper we analyze the internationalization of the higher education in Romania and EU countries, identifying the forms of the internationalization, the main statistical indicators available to measure the process of internationalization. The figures presented in this article show that although Romania took some measures to support the internationalization and the number of foreign students started to increase especially after 2007, it has one of the lowest rates of student mobility among EU countries. The asymmetry ratio of students' mobility shows that Romania is not currently an attractive country for tertiary education. Only medicine seems to attract foreign students mainly because the tuition fee is much lower than in other European countries. The determinants of the student mobility were investigated through some simple regression models which showed that the GDP per capita and the ratio between the number of students and professors influence the decision to study abroad.

**Keywords:** higher education, internationalization, mobility, statistics of education

**JEL Codes:** I23, I21

## **1. Introduction**

Internationalization of higher education has become a part of the globalization process (Scott, 2000). While 20-25 years ago internationalization was regarded exclusively through the student mobility, today there is another vision of the internationalization of the higher education (Dragoescu 2015). Internationalization of higher education is an evolving concept which includes all practices of the higher education institutions to face the new global academic environment as well as the policies at national, regional or international level developed to promote student or academic staff exchange. Internationalization of higher education is based on a set of underlying values and principles such as intercultural learning and mutual respect, academic integrity, equitable access and quality.

At this moment there is no well-defined conceptual framework for defining the internationalization of higher education but there are efforts to develop such a framework, some of them being presented in (Qiang, 2003). One of the current definitions used for internationalization is given by Knight (2003) and Knight (2008) who states that the internationalization is an integration process of the international, global and intercultural dimensions of the purpose and mission of post-secondary education. The process of

internationalization can be seen on two levels: internationalization within the national educational system and internationalization across the national borders. The first level refers to the strategies adopted by higher education institutions for students to understand the benefits of internationalization and intercultural skills and the second level regards the mobility of students, teachers and researchers. The motivations for internationalization are presented in Altbach (2007), the evolution of the higher education internationalization is presented in (Gao et al. 2015) and (Altbach et al., 2009) while an overview of the European experiences in internationalization is presented in Teichler (2009) who describes the efforts made during the implementation of the Bologna process towards the internationalization in higher education.

The development of internationalization needs that higher education institutions have a strategy and allocate a special budget for these activities. While in over 60% of the EHEA countries more than half of higher education institutions have adopted strategies on internationalization (European Commission/EACEA/Eurydice, 2015) in Romania fewer than 25% of higher education institutions have adopted such an internationalization strategy.

The development of joint programs by universities from different countries is another aspect of internationalization. Belgium, France, Germany, the Czech Republic and Portugal have more than 10% of universities with at least one study program developed jointly with a university from another country (European Commission/EACEA/Eurydice, 2015). Currently, there are certain barriers to the development of such programs, especially related to national legislation that is either ambiguous or not yet allowing universities to offer degrees by such programs. Financing the joint programs is a key factor for their success. In the recent years most of these programs were financed either by European funds such as Erasmus Mundus programme (European Commission, 2016) either by the universities that have priorities in this field. Only a few countries such as Finland, Italy, Lithuania, Norway, Germany, Romania or Spain have mechanisms for additional financing the joint programs.

Distance learning can be viewed as a mean of internationalization of tertiary education because Internet access has become ubiquitous and very cheap in most of the European countries. Online courses are means by which students who do not move to another country to study can participate to international study programs. The term commonly used for the online courses that universities offer to students around the globe is MOOC (Massive Open Online Courses) and was used for the first time since 2008 (Cormier, 2008). This form of education has virtually exploded in the U.S. after 2012 where edX ([www.edx.org](http://www.edx.org)), Coursera ([www.coursera.org](http://www.coursera.org)), and Udacity ([www.udacity.com](http://www.udacity.com)) led to massive development of online courses. MOOC is now regarded as a major innovation that takes place in higher education (Par, 2013; Watters, 2012) threatening the classic form of education due to much lower costs and high accessibility.

The purpose of this paper is two-fold: first we provide a descriptive view of the internationalization of the higher education and second we analyze the determinants of the students' mobility by the means of linear regression models.

The rest of the paper is organized as follows: the next section presents the data used to analyze the internationalization of higher education and the main methodological approaches, in section 3 we discuss students' and academic staff mobility issues in Romania and EU countries, in section 4 we try to identify the main determinants of the students' mobility using a series of linear regression models and in the final section we present the conclusions of our study.

## **2. Data and methodology**

Data series about higher education statistics are available from multiple sources: UNESCO database, Eurostat database or World Bank database. In our study, we used data series regarding the number of foreign students enrolled in Romanian universities retrieved from UNESCO database, the decomposition of this number by the region of origin retrieved from Eurostat database as well as the number of foreign students by the field of study in Romania also retrieved from Eurostat database. The internationalization of the higher education in EU countries was analyzed using the inbound and outbound students' mobility rates and the asymmetry ratio, all the necessary data series being retrieved from Eurostat database for 2012, the last year with complete data in Eurostat database.

We tried to identify the determinants of the students' mobility in EU28 countries using a number of economic as well as non-economic data series presented in table 1. The economic variables considered in our models were the GDP per capita, the social protection expenditures, the employment rate and the mean income for higher education graduates. We chose these economic variables as a measure of the economic attractiveness of a country for foreign students.

The non-economic variables we used in our models are a measure of the quality of the tertiary education in a country: the students-professors ratio and the number of universities in Top 500. Although there are other quality indicators for higher education systems such as the student services, the laboratory equipment, training materials, etc. the lack of data availability at EU level prevented us from using them. Table 2 shows some descriptive statistics of the selected variables. All the data series were for 2012, the most recent year Eurostat has complete data for all EU28 countries.

Table 1. The variables used in the regression models

Variable	Meaning	Data source
FOREIGN_STUD	The percentage of foreign students in the total number of students from a country	Eurostat
GDP_PER_CAPITA	GDP per capita (EUR)	Eurostat
SOCIAL_PROTECTION_EXP	Social protection expenditure per capita (EUR)	Eurostat
EMPLOYMENT_RATE	Employability rate for higher education graduates	Eurostat
MEAN_INCOME	Equivalent net income	Eurostat - SILC
TS_RATIO	The ratio between the number of students and the number of professors	Eurostat
NO_TOP500	Number of TOP 500 universities from a country	<a href="http://www.shanghai ranking.com/ARWU-Statistics-2012.html#2">http://www.shanghai ranking.com/ARWU-Statistics-2012.html#2</a>

Table 2. Descriptive statistics of the variables used in the regression models

Variable	Mean	Median	Maximum	Minimum	St.Dev.
FOREIGN_STUD	5.2297	2.6854	40.9836	0.1907	7.8647
GDP_PER_CAPITA	23,978	19,500	75,900	5,200	15,363
SOCIAL_PROTECTION_EXP	6,666	5,087.6	18,862.1	951.6	4,938.1
EMPLOYMENT_RATE	81.67	81.95	87.7	70.3	4.36
MEAN_INCOME	20,916.7	20,956	51,755	4,171	11,775

TS_RATIO	15.99	14.69	44.5	3.75	7.48
NO_TOP500	6.71	2	38	0	10.42

We employed a number of linear regression models where the endogenous variable was the percentage of foreign students in the total number of students from a country (which is the inbound mobility rate) and the exogenous variables were the economic and non-economic variables described above.

Since we considered six regressors, the total number of combinations between them is considerably high. Therefore, in order to select the best regression models we used the *best subset selection procedure* described in detail in (James et al., 2013) to choose among the possible models. We applied this procedure using the `leaps` library of the R software system. The criteria used to select the best models were the RSS but using adjusted  $R^2$  or BIC one can obtain the similar results. Considering  $p$  regressors, the best subset selection procedure chooses the best model with  $1, 2, \dots, p$  regressors iteratively, adding a new regressor to the previous model in each iteration. Finally, the best model is chosen according to the criteria set by the user. Since our purpose is not to find a single model to predict the mobility but to analyze the determinants of the mobility we presented the estimations for all  $p$  models (in our case,  $p=6$ ). Besides these six models we also considered two more models including two of the economic variables identified to have a significant influence on the students' mobility and the students-professors ratio. All the regression models were estimated using the ordinary least squares method with the R software system.

### 3. Students and academic staff mobility in Romania and EU countries

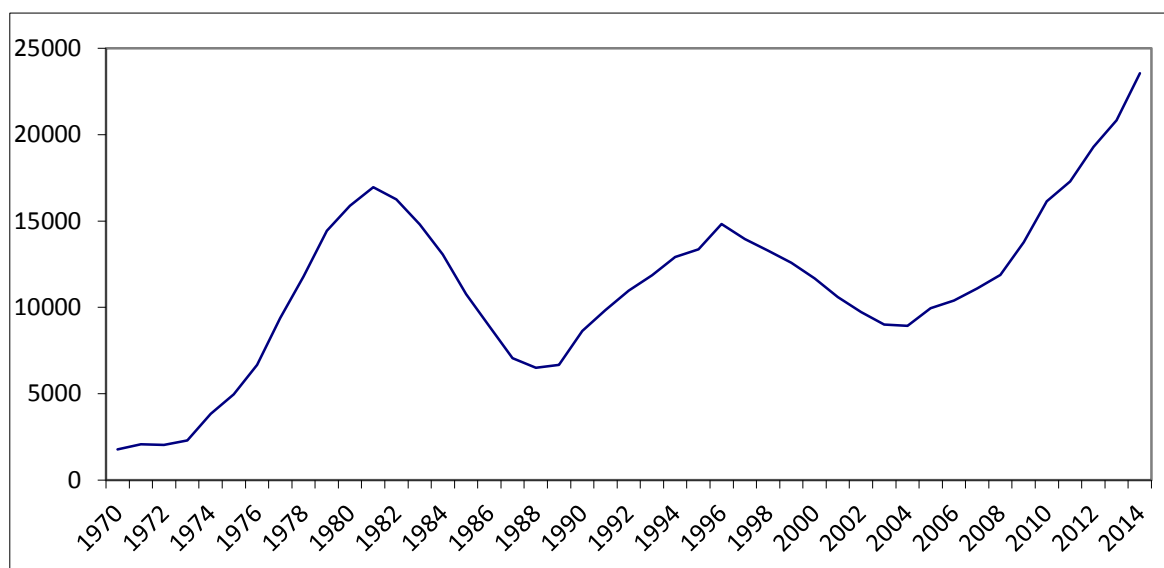
#### 3.1 Students mobility

Figure 1 presents the evolution of the number of foreign students enrolled at a university in Romania for undergraduate studies during 1970-2014 while the number of foreign students in the academic year 2014-2015 is presented by the continent of origin in Table 3. It can be observed that 66.3% from the total number of 23,559 foreign students who studied in Romania during 2014-2015 academic year came from European countries. The share of foreign students in the total number of students during the academic year 2014-2015 in Romania was 4.07% and the share of students from European countries was 2.69%, which places Romania among the countries with the lowest rates of mobility at European level.

Table 3. The number of foreign students who studied in Romania in 2014-2015

Europe	Asia	Africa	North America	South and Central America	Oceania	Other countries	Total
15,611	4,646	2,849	310	115	17	11	23,559

\* data source: Eurostat



\* data source: UNESCO database

Figure 1. The number of foreign students in Romanian universities

Although since 2004, and especially after 2007 when Romania joined the EU, the number of foreign students studying in Romania has an upward trend, their share in the total number of students is very low: the highest value was 8.9% in 1982, especially due to the overall small number of students, not just to the large number of foreign students. During the period after 1990, the highest percentage was recorded in 2014-2015 when 4.07% of the total number of students in Romania was from foreign countries.

The number of foreign students in Romania by the field of study is presented in Table 4 where one can observe a great inequality between the fields of study. It appears that the most attractive areas for foreign students are health and welfare (especially medicine) and social sciences, business and law. On the opposite side are the programs that prepare teachers for the educational system or programs in science, mathematics and computing. The Romanian medicine schools attract a relative large number of foreign students mainly because of the low tuition fee comparing with other countries. In Romania the tuition fee is around 2000 EUR per year while in other European countries this fee is very large: in the Czech Republic it is 60,000 EUR for the entire six-year program (Centre for International Cooperation in Education, 2016), in Hungary 20,000 EUR (Educations.com, 2016), in Poland around 50,000 EUR (Medical Study Guide, 2016) while in the UK it is around 36,000 £ (QS Top Universities, 2016) per year of study.

Table 4. The number of foreign students in Romania by the field of study

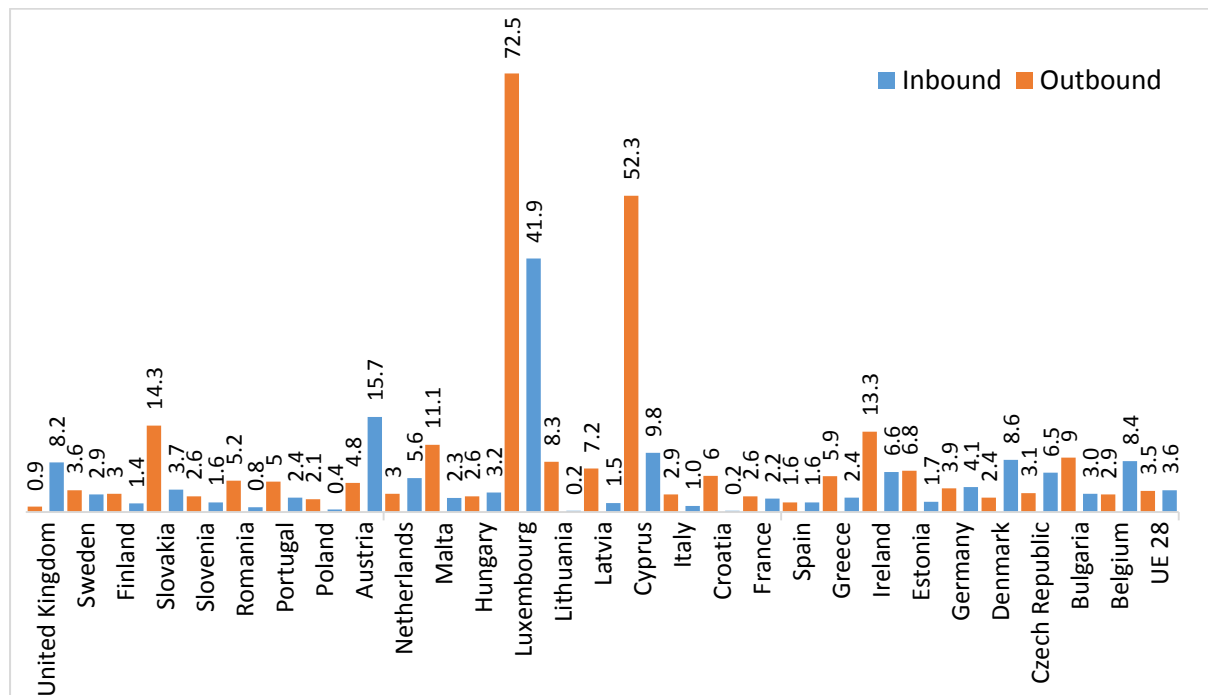
Study field	2008	2010	2012	2014
Education	36	56	51	39
Humanities and arts	1,357	1,451	1,541	1,818
Social sciences, business and law	4,263	4,471	4,272	4,290
Science, mathematics and computing	469	598	527	677
Engineering, manufacturing and construction	2,024	2,030	2,582	2,892
Agriculture and veterinary medicine	249	290	317	3,150
Health and welfare	5,262	8,225	10,461	10,008
Services	197	266	486	685

\* data source: Eurostat

One of the priorities of the Bologna Process is to increase the mobility of students, researchers and professors because it generates academic and cultural benefits, helps to increase employability and labor market access of young people (European Commission/EACEA/Eurydice, 2015). At the Conference of Education Ministers of the EU countries in 2012 mobility was defined regarding two aspects: obtaining credits of study in another country (at least 15 ECTS) and full graduation of study programs in another country, i.e. obtaining a diploma, but yet there are no statistics at international level to evaluate separately the two types of mobility.

At the meeting of EU education ministers during 28-29 April 2009 in Leuven / Louvain-la-Neuve where they reviewed the progress of implementation of the Bologna Process, they set a target for 2020 that at least 20% of university graduates in the EHEA countries should have had a period of mobility. There are a number of countries that proposed even higher targets for student mobility (EHEA, 2012a). For example, Germany, Austria and Denmark have proposed this target to be 50%.

Student mobility rates in the EU countries in 2012 are shown in Figure 2. The mobility rate of the students is measured using two statistical indicators: inbound mobility rate and outbound mobility rate. The inbound mobility rate computed by Eurostat is given by the percentage of the foreign students that come to a host country for studies while the outbound mobility rate is given by the percentage of the national students who go to study abroad. Only EEA and candidate countries were considered when measuring these indicators. The average inbound mobility rate for EU28 countries was 3.6% and that of the outbound mobility was 3.5%.



\*data source: Eurostat

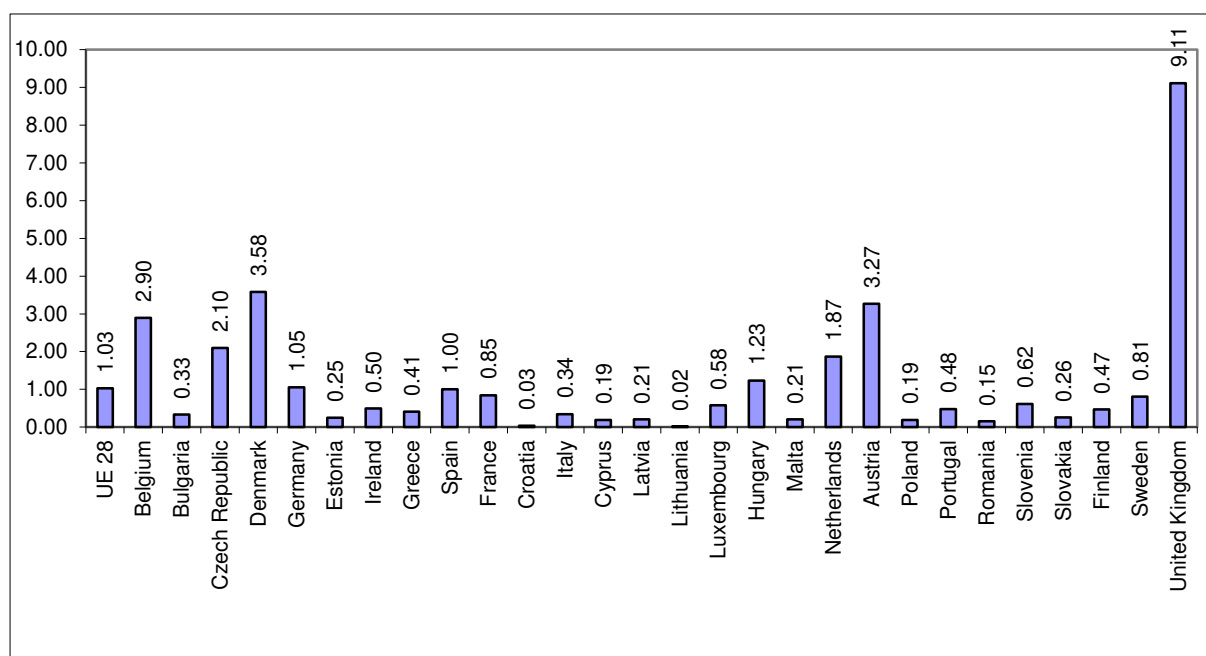
Figure 2. Inbound and outbound students' mobility rates (%) in EU28 countries during 2012

Although these percentages are still very low compared to the targets set for 2020, there is a wide inequality among EU member states: the inbound mobility rate varies from 41.9% for Luxembourg to 0.2% for Lithuania and the outbound mobility rate varies from 72.5% for Luxembourg to 0.9% for the UK. Most of the students in Cyprus and Luxembourg are going to study in other countries probably due to the low educational supply in their

countries. Among the countries with a high outbound mobility rate one can note the Eastern European countries that also recorded a very low inbound mobility rate. For 11 EU countries the ratio of students who go to study abroad is below 3% with the lowest values recorded for UK with 0.9% and Spain with 1.6%. Countries that receive most of the foreign students are the UK, Austria, Luxembourg, Denmark, and Belgium. At European level, the UK had the largest number of foreign students – 150,133 in 2012, which is 2 times greater than Germany.

Generally, the inbound mobility is a recognition of the attractiveness of higher education institutions of a country in terms of learning provision, quality of education or financial capacity while the outbound mobility can be the result of either encouraging the students to follow at least a part of a study program in another country, the poor quality of higher education provision in the native country, or of the difficulties encountered by the graduates on the labor market in their native country.

In the statement of the Education Ministers in Bucharest (EHEA, 2012b) it is noted that a goal for the coming years is to achieve a more balanced mobility of students. Asymmetry mobility which is another indicator of the inequality of the students' mobility and it can be quantitatively assessed by the ratio of the number of foreign students coming to study in a country and that of its students who go to study abroad. We computed the values for the asymmetry mobility for 2012 and the results are shown in Figure 3. If the values of this ratio are greater than one this means that the country "imports" students from abroad while if the ratio is lower than one this means that the country "exports" students. Analyzing the values shown in Figure 3 we can see that a number of 19 countries from the EU28 countries are exporting to students while only 9 countries are importing students. Among the countries with the highest value of this ratio there are the UK, Denmark, Austria, Belgium, the Czech Republic and the Netherlands. Countries for which there is a larger imbalance but in the opposite direction, the number of students leaving the country being much higher than of those coming in are Romania, Lithuania, Estonia, Poland, Croatia, Cyprus and Slovakia.



\* data source: author's own calculation after Eurostat data

Figure 3. Assymetry ratio: the ratio between the number of students coming to study in a country and the students who go to study abroad in 2012



In order to have an increase of the mobility in the future a series of measures should be taken first by tackling barriers that have been identified so far: lack of appropriate funding, language barriers, issues related to the organization of the studies (undergraduate curriculum structure), issues related to the fields of study where particularly medicine and law studies raises the problem of the recognition of diplomas, the lack of detailed information about opportunities to study abroad, issues related to the separation of families of students.

Among the measures proposed to address these obstacles are:

- portability of the study grants. This measure comes to combat insufficient funding allocated to support mobility. So far, portability of grants is implemented only in Western European countries;
- various forms of support for students studying abroad: offering part-time jobs, providing loans on favorable terms to students, organizing free courses for learning the language of instruction;
- organizing a larger number of study programs in foreign languages, especially in English. Several European countries supports this initiative at the legislative level. The law of higher education and research which was adopted in July 2013 in France allows higher education institutions to open study programs in languages other than French within international partnerships while in Belgium the law allows up to 25% of courses in undergraduate studies and 50% of master's study programs to be taught in a language other than the national language;
- create a legal framework to solve problems related to recognition of diplomas.

### **3.2 Academic staff mobility**

Academic staff mobility is considered as important as student mobility but so far there is no statistical system to quantitatively assess this type of mobility. Academic staff mobility is related to all types of personnel: professors, researchers and administrative staff. It can contribute to the socio-cultural and scientific exchanges and to the labor market reform (Cradden, 2007). Academic staff mobility includes visits and sabbaticals, grants and fellowships, untenured or tenured employment. The problems of academic staff mobility analysis are similar to those of student mobility and they include:

- the direction of the mobility: academic staff leaving to teach in another country versus academic staff coming from other countries;
- the duration of mobility;
- the category of personnel: professors, researchers, PhD students, administrative and technical staff.

Some European countries such as for instance the Czech Republic included the academic staff mobility into the strategic plan of the Ministry of Education creating facilities for bringing foreign experts to teach in Czech universities while Estonia, Finland, France, Romania or Slovenia's strategic plans in the field of tertiary education even include quantitative targets regarding the mobility of academic staff. In Lithuania the strategic plan stipulates that 10% of the academic staff must participate to mobility programs by 2020 and in Romania, the National Agency for Community Programs (<http://www.anpcdefp.ro>) foresee an annual increase of the number of the academic staff going to teach in other countries within the Erasmus program by 5%. Among the problems hindering the academic staff mobility at this moment (European Commission / EACEA / Eurydice, 2015) we can mention the lack of funds, administrative personnel load problems, language problems and lack of motivation among the academic staff. Nevertheless, promoting academic staff mobility is an important issue of the higher education policy in the European area.

#### 4. The determinants of students' mobility

The drivers of the students' mobility are a new area of research. A number of recent studies try to analyze whether the key motivators for internationalization are of economic nature or not (Hudson, 2016). In our study we will try to identify the factors contributing to the inbound mobility of the students through a series of linear regression models where the endogenous variable is the percentage of the number of foreign students studying in a country and exogenous variables are both economic and non-economic factors (Dragoescu, 2015).

In the category of economic factors we considered the GDP per capita, the social protection expenditure per capita, the rate of employability for graduates of higher education, and the average equalized net income of the population with higher education (this indicator originated from the SILC survey conducted in all EU countries). We also considered two non-economic variables: the number of universities in the Top 500 (Academic Ranking of World Universities, 2012) from the country receiving the students and the ratio between the number of students and the number of professors as a measure of the attractiveness and the quality of the tertiary education. Some descriptive statistics and the sources of the data series used were already presented in section 2.

In table 5 we present the parameter estimations for 8 regression models solved by ordinary least squares method (Wooldridge, 2015) using the R software system. The first 6 models (M1 - M6) are the one indicated by the best subset procedure and in the last two models (M7 - M8) we included two of the economic variables together with the students-professors ratio, removing the intercept.

Analyzing the results shown in Table 5 it can be concluded that the only economic variables that influence the decision to study in a foreign country are the GDP per capita (we noted a positive correlation between the inbound mobility rate and GDP in all models) and social protection expenditure (negative correlation!). The coefficients of these two variables have associated p-values that indicate significance at 1%. The other economic variables, the mean income or the employability rate for people with higher education have coefficients that are not significantly different from zero, thus they cannot be considered as drivers of the students' mobility.

From the non-economic variables included in our models, the number of universities in Top 500 seems not to have an influence on the student mobility ( $p\text{-value} > 0.1$  in all cases) while the ratio between the number of students and professors could be considered as a determinant of the mobility (see the results of models M7 and M8). This ratio is used in several European countries, including Romania, as an indicator of the quality of the higher education: a small ratio means a high quality educational system.

These results indicate that the explanation of the very large number of foreign students in some European countries may also reside in the specific characteristics of higher education systems like for example the possibility of studying in English, facilities for students as scholarships, laboratory equipment in the higher education institutions, the tradition of higher education in the country, the value of the annual fees of study, student services etc. and not only in the macroeconomic indicators characterizing the country. Our results obtained in this study are consistent with other international studies (Seeber et al., 2016).

Table 5. The estimates of the regression models

	<b>M1</b>	<b>M2</b>	<b>M3</b>	<b>M4</b>	<b>M5</b>	<b>M6</b>	<b>M7</b>	<b>M8</b>
GDP_PER_CAPITA	3.972e-04 (p=1.23e-6)	0.0014245 (p=3.21e-9)	0.0013684 (p=2.29e-8)	1.405e-03 (p=2.76e-07)	1.416e-3 (p=4.78e-07)	1.418e-3 (p=1.56e-6)	0.0004 (p=3.3e-8)	0.0011 (p=0.0000)
SOCIAL_PROTECTION_EXP		-0.0032950 (p=6.24e-7)	-0.003071 (p=7.11e-6)	-3.026e-03 (p=1.79e-05)	-3.004e-3 (p=3.02e-05)	-3.017e-3 (p=0.0001)		-0.002 (p=0.0002)
EMPLOYMENT_RATE					-6.609e-2 (p=0.673)	-6.172e-2 (p=0.75)		
MEAN_INCOME				-7.145e-05 (p=0.71)	-8.922e-5 (p=0.656)	-8.657e-5 (p=0.67)		
NO_TOP500			-0.069382 (p=0.29)	-6.050e-02 (p=0.397)	-5.544e-2 (p=0.452)	-5.573e-2 (p=0.46)		
TS_RATIO						4.925e-3 (p=0.96)	-2.02 (p=0.015)	-0.228 (p=0.0005)
C	-4.295 (p=0.024)	-6.963 (p=3.47e-6)	-6.6406 (p=1.2e-5)	-6.377 (p=0.00016)	-1.053 (p=0.93)	-1.516 (p=0.93)		
R <sup>2</sup> adj	0.58	0.84	0.84	0.84	0.84	0.83	0.72	0.85

## 5. Conclusions

In this paper we analyzed some issues of the higher education internationalization in Romania and EU countries. Internationalization of higher education has several benefits. Among them we can mention improved quality of teaching and research, developing inter-institutional cooperation, improved access to the labor market for graduates, and improved institutional policy-making. Although there are a lot of benefits of the internationalization process we showed that the student mobility in Romania continues to have low levels: during the 2014-2015 academic year only 4.07% of the total number of students in Romania came from foreign countries. The most attractive field of study for foreign students in Romania proved to be medicine since the associated costs are much lower than in other EU countries.

At the EU level, internationalization of the higher education has also a low level: the inbound mobility rate for EU28 countries in 2012 was 3.6% and the outbound mobility was 3.5%. Regarding the academic staff mobility which is another component of the higher education internationalization, there are no statistical indicators comparable at the international level that allows the researcher to measure this process.

We identified MOOC as another form of higher education internationalization but the graduation rate of this kind of courses is still very low (around 10%) and certificates obtained by the graduates have not yet found recognition in education law of any country. The causes for this low are multiple: language barriers, ICT skills, time constraints (Fini, 2009). Nevertheless, MOOC development has led universities to consider this form of education as a form of internationalization that increase the visibility of an institution at international level.

Using a series of econometric models we tried to identify the determinants of the students' mobility for EU countries. We included both economic variables and non-economic variables in our models. The results of the estimations showed that the GDP per capita is an important economic determinant of the student's mobility across European countries. Other economic variables included in our study like the employment rate or the mean income for higher education graduates seems not to influence the students' mobility. Regarding the non-economic variables we found out that the students-professors ratio significantly influences the mobility. This is normal, since this ratio is a measure of the quality of an educational system.

While the average level of the internationalization of higher education in EU countries is rather low, improving the mobility of students and academic staff in the near future requires some measures from universities such as: restructuring their curricula, introduction of more courses in English (which is the main language of study at international level), development of study programs in collaboration with other universities abroad and development of communication skills in a foreign language for the administrative staff. Also, universities should improve their work promoting international study programs to make known their educational offer to students in other countries. At the governmental level, the funds for mobility should be increased and some financial support schemes for students who want to study in another country should be provided.

In the last years Romanian higher education institutions made important efforts to promote internationalization, but Romania still has a very low student mobility ratio among EU countries.

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