Does Erasmus Mobility Increase Employability? Using Register Data to Investigate the Labour Market Outcomes of University Graduates

Daniela Crăciun, Kata Orosz, and Viorel Proteasa

1 Introduction

International student mobility is not a new phenomenon (Altbach 2005; Guruz 2008). However, there has been a significant growth in scale in the last few decades. The Organization for Economic Cooperation and Development (OECD) estimates that the number of international students across the world has increased from 0.6 million in 1975 to 2.4 million in 2004 (OECD 2006) and a staggering 4.6 million in 2015 (OECD 2017). In Europe, international student mobility is regarded as one of the most important drivers for synchronizing the continent's disparate higher education systems to the same heartbeat.

In this context, the Erasmus program is considered the "flagship of European cooperation" (Barblan 2002) in higher education. Approximately 4.4 million higher education students have participated in the Erasmus+ program in the three decades since the program was set up in 1987, and the program continues to steadily increase in popularity (European Commission 2017). This year, the European Commission has pledged "to triple the Erasmus+ budget (going beyond the Junker Commission's proposal to almost double the envelope)" (Rubio 2019, (1) for the 2021–2027 programming period. The policy decisions at the European level are mirrored by national and institutional trends of students' participation in Erasmus outgoing mobilities (see Fig. 1):

D. Crăciun (✉)
University of Twente, Twente, The Netherlands
e-mail: d.craciun@utwente.nl

K. Orosz
Central European University, Vienna, Austria
e-mail: oroszk@ceu.edu

V. Proteasa
West University of Timisoara, Timisoara, Romania
e-mail: viorel.proteasa@e-uvt.ro
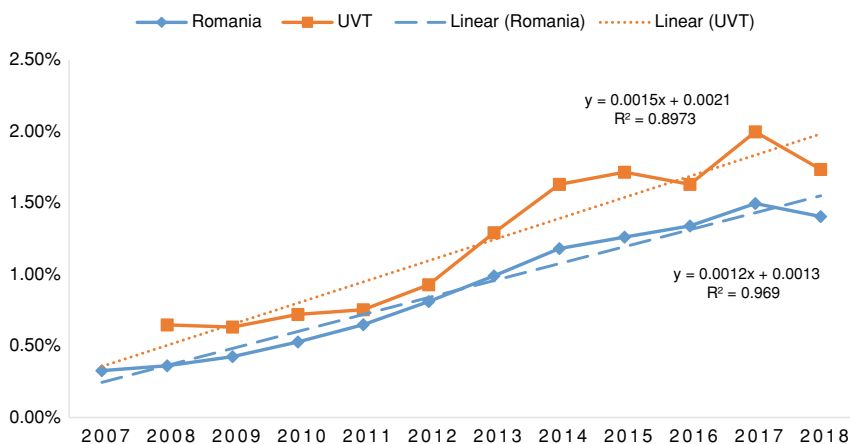
% OUTGOING ERASMUS STUDENT MOBILITY

Fig. 1 Participation in Erasmus outgoing mobilities: national trends for Romania and institutional trends for the West University of Timisoara Source: Compiled by authors from data from The National Agency for Community Programmes in the Field of Education and Vocational Training (ANPCDEFP)—Erasmus programme data, The National Council for Financing Higher Education (CNFIS)—student cohorts country level data, The West University of Timisoara—student cohorts institutional data

Notwithstanding the increasing popularity of and investment in international student mobility, the actual labour market benefits for individuals are still widely debated (Di Pietro 2019). One of the major claims has been that individuals who study abroad enjoy better labour market outcomes than their non-mobile peers (Wiers-Jenssen and Try 2005, Wiers-Jenssen 2008, 2011). Specifically, both credit and degree mobility are said to lead to a better insertion into the labour market (and thus to decreased unemployment), above-average earnings, a more prestigious occupation, and a higher likelihood that graduates will work outside their country of permanent residence/citizenship.

However, the actual impact of student mobility on labour market outcomes is less clear, as research is scarce, the evidence used is often "qualitative and anecdotal" or is prone to bias (Di Pietro 2019). Traditionally, the effect of mobility on employability has been measured using interview or survey data collected from (1) students who participated in mobility programs, (2) university administrators in charge of study abroad programs, and (3) employers (Di Pietro 2015, 2019). While these types of studies provide important insights about the benefits associated with international student mobility they can be affected by social desirability bias (Bowman and Hill 2011) and they rarely account for causality.[1] Thus, linking mobility and employability

---

[1] The net effect of student mobility on top of other predictors that are associated with both propensity to be internationally mobile as a student and employable as a graduate, e.g. individual ability (Kucel and Vilalta-Bufi 2016 Mallik and Shankar 2016) or family background (Akhmedjonov 2011 Kucel and Vilalta-Bufi 2016 Mourifie, Henry, and Meango 2018).

in a causal relationship is challenging due to selection and self-selection effects, i.e. "[s]tudents who study abroad may differ from students who do not in unobserved characteristics that are likely to affect labor market outcomes" (Di Pietro 2019), and omitted variable bias which can lead to over-estimating or under-estimating the impact of international mobility on employability.

Various econometric techniques can be used to mitigate the selection problems inherent to observational data, including the use of fixed effects, instrumental variables, various propensity score matching techniques, and regression discontinuity designs (Schneider et al. 2007). While such techniques are invaluable in reducing bias that results from omitted variables and various forms of selection, no analytic technique can provide valid estimates if the data on which the analysis is performed is of questionable quality. Obtaining high-quality data by means of surveys is highly resource-intensive. In this chapter, we take an alternative approach, that of using register data to answer questions about the benefits of international student credit mobility.

According to Andersson and Nilsson (2016, 4), in national (or institutional) contexts in which "there is access to national registers that cover the entire population", register data on income, occupation, unemployment (Nilsson 2017, 79) enable more "penetrating" (Andersson and Nilsson 2016, 4) and more cost-efficient analyses. Using register data offers the possibility to use already existing population-level data and compare the actual employment outcomes of mobile and non-mobile students. In this chapter, we present an analysis based on register data from university records and national employment and baccalaureate exam records of 8 cohorts of graduates between 2007 and 2014 from the West University of Timisoara (UVT), a leading comprehensive university in Romania. By demonstrating the utility of pre-existing data sources in answering policy-relevant research questions through the case of this single institution, we want to send a broader message to ministers of education and higher education leaders: to release existing register data to the research community. In this way, the linkages between education and labour market outcomes can be rigorously and efficiently tested, descriptions of population parameters from which samples are drawn can be more robust, and policy-makers and institutional leaders can have access to the evidence needed to make informed decisions.

In order to illustrate the utility of combining data from pre-existing registers, the chapter analyses the impact of credit mobility on labour market outcomes using institutional- and national-level data. In our analyses, we sought to answer the following question: Does credit mobility have a positive impact on graduate employability? To answer this overarching question, we establish the predictors of international student mobility and test whether credit mobility is significantly positively associated with labour market insertion, income levels and occupational prestige. Specifically, we address the following research questions: (1) What are the predictors of participation in Erasmus mobility among the specific population of graduates we analyse? (2) Does participation in the Erasmus student mobility program predict insertion on the labour market within that population? Among those graduates who had an active work contract, is participation in the Erasmus student mobility program predictive of (3) an above-average salary or (4) having a more prestigious occupational category?

To answer these questions, the chapter proceeds as follows. First, an overview of existing studies exploring the relationship between international student mobility and employment outcomes is provided. Second, the methodology employed and the analytic sample are described. Third, the results of the data analysis are presented and discussed. Finally, the concluding section highlights avenues for further research and makes an argument for the benefits of using existing register data to test theoretical claims in higher education research.

2 Literature Review

There is a plethora of theoretical arguments linking international student mobility with individual benefits that are expected to translate into better employment outcomes for graduates, but relatively few empirical studies have tested these causal claims (Di Pietro 2015, 2019; Wiers-Jenssen and Try 2005). This section explores the theoretical expectations and empirical evidence brought forward by previous research on the relationship between study abroad and labour market outcomes.

The theoretical expectation linking mobility and employability is that individuals who study abroad will accrue non-economic benefits (i.e., skills, mobility capital) that will ultimately transform into economic benefits (i.e., favourable labour market outcomes such as domestic or international employment, higher wages, higher occupational prestige) (Crăciun and Orosz 2018). This is expected on the premise that the skills acquired by individuals through studying abroad are marketable (i.e., valued by employers) (Di Pietro 2015) and because mobility widens the job search area of graduates beyond the domestic labour market (i.e., more and better employment opportunities) (Di Pietro 2019).

International student mobility is perceived and expected by participants, university administrators, and employers to have a positive effect on all aspects of a worker's skill set. First, mobility has been shown to have a positive impact on individuals' cognitive skills, particularly foreign language proficiency (Canto et al. 2013; Llanes et al. 2016), problem-solving, and decision-making skills (Bikson et al. 2003). Second, studying abroad exposes students to foreign cultures which is expected by employers to have a positive impact on their non-cognitive skills, especially inter-personal and inter-cultural skills, confidence and self-reliance (Bikson et al. 2003; Bracht et al. 2006; King et al. 2010; Matherly 2005). Third, mobility can improve job-specific skills for jobs that have an international component or give students the skills and experience to pursue an international career (Di Pietro 2019).

Cognitive, non-cognitive and job-specific skills are all valued in the workplace, so the expectation is that they will be rewarded by employers through hiring, higher wages and more prestigious jobs. Table 1 provides an overview of research findings from existing studies on the relationship between mobility and these employability indicators.

Several studies have shown that there is a positive relationship between mobility and various labour market outcomes (European Commission 2014, 2016; Di Pietro

Table 1 The relationship between international student mobility and labour market outcomes

Indicator	Benefits for internationally mobile students
Labour market insertion	(+) Less likely to face long term unemployment (European Commission 2014, 2016)
	(+) Lower unemployment rates 3 to 10 years after graduation (European Commission 2014, 2016; Di Pietro 2019; Schnepf and Hombres 2018)
	(+) Mobility useful in securing (first) job (Bracht et al. 2006; King et al. 2010; Teichler and Janson 2007)
	(+) Mobility experience contributes to making job interviews more successful (King et al. 2010)
	(=) No difference in unemployment rates of mobile individuals compared to non-mobile individuals immediately after graduation (Wiers-Jenssen 2011)
	(=) No difference in probability of employment 1 month after graduation (Koda and Yuki 2013)
	(=) No difference in holding a graduate level job (Koda and Yuki 2013)
	(-) Takes a longer time to find a job (Rodrigues 2013)
Earnings	(+) Higher wages (Rodrigues 2013; Varghese 2008)
	(=) No difference in (starting) wages compared to non-mobile individuals (Koda and Yuki 2013; Messer and Wolter 2007; Wiers-Jenssen 2011)
Occupational category	(+) Likely to have jobs with high professional responsibility (Bracht et al. 2006)
	(+) More likely to occupy managerial positions 6 months after graduation (Schnepf and Hombres 2018)
	(+) More likely to hold a management position 5 to 10 years after graduation (European Commission 2016)
International career	(+) More likely to work abroad after graduation (Parey and Waldinger 2011; Di Pietro 2012; Rodrigues 2013; Teichler and Janson 2007; Varghese 2008)
	(=) No difference in likelihood to have an international job compared to non-mobile individuals (Wiers-Jenssen 2011)

Source Compiled by authors

2019; Schnepf and D'Hombres 2018) "though they provide mixed results about the magnitude of this effect" (Di Pietro 2013, 6). Others find no difference between mobile and non-mobile students in terms of employment outcomes (Koda and Yuki 2013; Messer and Wolter 2007; Wiers-Jenssen 2011).

3 Data and Methodology

In order to test whether there is a statistically significant relationship between international credit mobility and employment outcomes, the chapter relies on an original dataset constructed from institutional and national register data. We linked three sources of register data to create the analytic data set: (1) university register data of individuals who completed a bachelor's and/or master's degree at UVT, and national register data on (2) baccalaureate exam scores and (3) labour market outcomes. The data comes from an institutional, ICT intensive, tracer study (Proteasa et al. 2018).

The initial dataset was based on university register data of individuals who completed a bachelor's and/or master's degree at UVT. This data set contains, among other things, information on UVT graduates' age, gender, the start year of their bachelor's and/or master's degree, the field of study, whether they received social and/or merit-based scholarships during their studies, and whether they participated in Erasmus mobility during their time at UVT. This dataset was then matched with publicly available data on the graduates' baccalaureate exam scores launched in 2004 (Ministerul Educatiei Nationale 2019) and with information about UVT graduates' labour market outcomes. Information about UVT graduates' labour market outcomes was requested and received from ReviSal, a mandatory national register for all employees in Romania that was launched in 2011 (Guvernul României 2011).

Matching ReviSal data with university records allowed us to capture information on whether UVT graduates had an active working contract with an employer operating in Romania, as well as information on the highest salary and highest occupational category associated with each individual's working contract(s) during the period 2011–2018. This meant that we were able to test whether mobile students actually enjoyed better insertion into the labour market, above-average earnings and/or a more prestigious occupation as compared to non-mobile students.

The raw dataset included information on individuals who completed at least a bachelor's degree at UVT (n = 20,707). From this dataset, a number of observations were excluded for various theoretical and practical reasons that are discussed next. First, UVT graduates who could not be matched with ReviSal data were excluded from the analytic dataset, as a lack of match to ReviSal records meant that no conclusions could be drawn about their labour market outcomes. Second, UVT graduates who started their bachelor's degree program in or before 2007 were also excluded from analysis, as the UVT Erasmus mobility records we had access to only start from the academic year 2007/2008. Third, UVT graduates who started their bachelor's degree program in or after 2015 were also excluded from analysis, because they could not have completed their studies by January 2018, the date when the ReviSal export was received. Finally, UVT graduates whose baccalaureate exam score was missing were also excluded from the analysis, as we used their performance on this national exam as a proxy for academic ability. As a result of delimitating the raw dataset in this way, we ended up with an analytic dataset of n = 16,565, which includes information on the labour market outcomes of both mobile (n = 719) and non-mobile (n = 15,846) UVT graduates.

Table 2 provides summary statistics for the variables used in our data analysis. The majority of the individuals (88.5)[2] in our analytic sample were born between 1988 and 1995. They started their bachelor's degree program at UVT between 2007 and 2014. The average baccalaureate score among UVT graduates who participated in Erasmus credit mobility was 8.95, which is statistically significantly higher (t = −8.7507; p = 0.000) than the average baccalaureate score of UVT graduates who did not participate in Erasmus credit mobility (8.63). Moreover, the average

---

[2]According to the birth year analysis, some people in the analytic sample who started their BA in 2007 or later were born as early as 1947.

Table 2 Descriptive statistics of UVT graduates in the analytic sample

	All UVT graduates (n = 16,565), %	Mobile UVT graduates (n = 719), %	Non-mobile UVT graduates (n = 15,846), %	Pearson χ^2 (p)
Gender	**100**	**100**	**100**	**16.1**
Women	71.7	78.4	71.4	(0.000)
Men	28.3	21.6	28.6	
Baccalaureate exam performance	**100**	**100**	**100**	**111.1**
Lowest quartile	25.2	16.0	25.7	(0.000)
Low-middle quartile	24.9	17.9	25.2	
High-middle quartile	25.0	25.9	25.0	
Highest quartile	24.9	40.2	24.2	
Field of study (BA)	**100**	**100**	**100**	**186.6**
Social sciences	61.3	44.5	62.0	(0.000)
Humanities and arts	22.0	42.1	21.1	
Math, natural sci., biology & biomed	13.1	12.1	13.1	
Physical education and sport	3.7	1.3	3.8	
Receipt of merit-based scholarship[a]	**100**	**100**	**100**	**378.5**
Did not receive	59.0	24.1	60.6	(0.000)
Received	41.0	75.9	39.5	
Receipt of social scholarship	**100**	**100**	**100**	**8.1**
Did not receive	89.9	86.8	90.1	(0.004)
Received	10.1	13.2	9.9	
Master degree status[b]	**100**	**100**	**100**	**124.8**
Never enrolled in a master program	40.4	21.1	41.3	(0.000)
Enrolled but didn't graduate	17.3	18.9	17.2	
Completed a master program	42.4	59.9	41.6	
Labour market insertion in Romania	**100**	**100**	**100**	**4.3**
Had a working contract[c]	76.2	73.0	76.4	(0.038)
No record of a working contract[d]	23.8	27.0	23.6	
Occupational category	**100**	**100**	**100**	**32.8**
Managers	3.9	2.5	4.0	(0.000)
Professionals	34.3	39.9	34.1	
Technicians & associate professionals	15.0	15.2	15.0	
Clerical support, service & sales workers	20.5	13.6	20.8	
Elementary occupations	2.6	1.8	2.6	
Missing	23.8	27.0	23.6	
Income relative to average salary[e]	**100**	**100**	**100**	**49.4**
Below-average salary	46.0	35.7	46.4	(0.000)

Table 2 (continued)

	All UVT graduates (n = 16,565), %	Mobile UVT graduates (n = 719), %	Non-mobile UVT graduates (n = 15,846), %	Pearson χ^2 (p)
Similar to average salary	8.4	6.7	8.5	
Above-average salary	21.9	30.6	21.5	
Missing	23.8	27.0	23.6	

Source Calculated by authors

[a] The receipt of social scholarship is based on financial need.

[b] The analytic sample for the analyses on insertion and occupational category was smaller than the analytic sample for labour market insertion since all observations that did not have an active work contract had to be excluded. We also excluded all observations that had missing data on income and occupational category. Thus, the analytic sample size in these analyses is n = 11,540. The proportion of mobile UVT graduates is 3.9% (n = 451), which is higher than the 1.8% average credit mobility rate of graduates from Romanian universities (European Commission 2018a). To compare, the average EU credit mobility rate of university graduates is 8% (European Commission 2018a).

[c] Only refers to enrollment at UVT graduates in the analytic sample who have a bachelor degree from UVT may have enrolled in master degree program at other universities in Romania, or abroad.

[d] Some UVT graduates had no record of a working contract in ReviSal for the period 2011–2017. This could happen either because these graduates were inactive, unemployed, self-employed or working in a so-called "liberal profession" (e.g., lawyers), or employed outside of Romania in the entire period of 2011–2017. Those who participate in Erasmus credit mobility may be more likely to work abroad after graduation (see Wiers-Jenssen 2011), and those who work abroad would not show up in the ReviSal database.

[e] Refers to having at least one working contract recorded in ReviSal for the period 2011–2017.

age at which UVT graduates completed their bachelor's degree was 22.7, which is statistically significantly lower (t = 4.4199, p = 0.000) than the average age at which UVT graduates who did not participate in Erasmus credit mobility completed their bachelor's degree (23.4).

To test what predicts labour market outcomes, the log odds of (1) having an active contract in Romania in the period 2011–2017 (insertion), (2) having an active contract that is associated with an above-average salary (earnings), and (3) having an active contract that is associated with a managerial or professional job (occupational category) were modelled as a function of UVT graduates' gender, field of BA study, year in which they started their BA, their age at graduation from BA (22 or below versus above 22), their performance in the baccalaureate exam (in quartiles), their receipt of a merit-based scholarship or social scholarship during their BA, whether they enrolled in or completed an MA degree at UVT, and whether they participated in Erasmus mobility during their studies at UVT.[3]

---

[3] We calculated relative income by comparing all working contracts to the average basic gross salary of the year in which they ended. Income information associated with working contracts still active in December 2017 were compared to the 2017 average basic gross salary. The average gross salary for each year was calculated based on data from national statistics.

For more robust results, we also estimated the relationship between Erasmus credit mobility, labour market insertion, earnings and occupational category with the help of propensity score matching[4] models, using the same set of co-variates as the logistic regression models discussed above. Detailed results from the logistic and propensity-score matched models are discussed in the next section, and the regression tables are available from the authors upon request.

4 Data Analysis and Results

(1) What Are the Predictors of Participation in Erasmus Mobility Among UVT Graduates?

Comparing mobile and non-mobile students,[5] the profile of Erasmus participants becomes apparent. Even though 78% of the mobile students are women, all other things being equal, gender is not predictive of participation in Erasmus mobility among the UVT graduates in our analytic sample. Over the years, higher mobility rates in the Erasmus program have been observed for women, at around 60% (Brooks and Waters 2011; Souto-Otero 2008; Teichler et al. 2011). Previous research has shown that for Romania, the gender gap is even bigger, with females representing 70% of mobile students at the national level (Souto-Otero and McCoshan 2006, 4). However, "[t]he feminisation of higher education is apparent at all levels of study" in national student populations (Orr et al. 2011, 59). Therefore, the tilted balance towards higher female participation rates can be in part accounted for by the general structure of national student populations.

Notwithstanding, other factors are predictive of participation in mobility. First, the year in which students began their BA studies is a positive predictor of mobility: with each year, the likelihood of participating in the Erasmus program was 12% higher. This finding is consistent with the growth in popularity, accessibility and funding of the Erasmus program over the years (European Commission 2017, 2018b), and reflected in the national and institutional trends—*see* Fig. 1 *in the introductory section.*

Second, age at the time of BA graduation is a significant negative predictor of credit mobility: each additional year in age is associated with a 28% lower likelihood

---

[4]"When subjects are not randomly assigned to treatment and non-treatment groups, as is the case with observational studies, other methods are needed to avoid the possibility of selection bias. Bias can arise when apparent differences in outcome between treatment and non-treatment groups can be attributed to characteristics that affected whether a subject received a given treatment rather than simply to the effect of the treatment itself. Propensity score matching adjusts for such potential bias by creating a sample group of subjects who received the treatment that is comparable on all observed characteristics to a sample of subjects that did not receive the treatment" (Di Pietro 2019).

[5]The log odds of participating in Erasmus mobility was modelled as a function of the UVT graduates' gender, the field of BA study, the year in which they started their BA, their age at graduation from BA, their performance in the baccalaureate exam (in quartiles), their receipt of a merit-based scholarship or social scholarship during their BA, and whether they enrolled in or completed an MA at UVT.

of participating in the Erasmus program. This finding is in line with the predictions of empirical studies on migration which "overwhelmingly conclude that the relation with age is negative, i.e., that the likelihood of migration decreases with age" (Zaiceva 2014, 4).

Third, academic ability is a predictor of Erasmus mobility. Students' performance at the baccalaureate exam (our proxy for academic ability) is a significant positive predictor of mobility. A one-unit increase in the baccalaureate exam score is associated with a 47% higher likelihood of participating in the Erasmus program. The receipt of a merit-based scholarship is also significantly positively related to mobility. Those students who received a merit-based scholarship were 3.2 times more likely to participate in Erasmus than those who did not receive such a scholarship. The fact that Erasmus grants are awarded on academic merit and that "Erasmus appears to be much more selective in Eastern Europe (where 20% of applicants are rejected)"[6] (European Commission 2016) could explain the magnitude of the relationship. There is no evidence of a link between the receipt of a social (i.e., need-based) scholarship and credit mobility in the analytic sample.

Fourth, degree level is significantly positively associated with Erasmus mobility. Compared to those who never enrolled in a master degree program at UVT, those who enrolled but did not complete were 91% more likely to participate in mobility, while those who completed a master degree were 97% more likely to participate in mobility. This makes intuitive sense, as those who remain affiliated with a higher education institution longer have more opportunities to apply for an Erasmus scholarship. All in all, the typical Erasmus mobility participant at UVT is young, academically able and more likely to pursue graduate education.

(2) Does participation in Erasmus mobility predict insertion into the labour market?

Participation in Erasmus mobility is significantly negatively associated with insertion in the domestic (i.e., Romanian) labour market in our analytic sample.[7] Graduates who were mobile during their studies at UVT (either during bachelor or master degree programs) were 40% less likely to have an active work contract with an employer operating in Romania, compared to non-mobile graduates. Rather than implying that mobile graduates are less likely to be employed, this finding is consistent with the body of evidence that suggests that mobile students are more likely to work abroad after graduating (Parey and Waldinger 2011; Di Pietro 2012; Rodrigues 2013; Teichler and Janson 2007; Varghese 2008) and, thus, less likely to appear in the national

---

[6]By way of comparison, the rates of Erasmus application rejection in other European regions are: 19% for Southern Europe, 9% for Western Europe and 7% for Northern Europe (European Commission 2016).

[7]The negative association between Erasmus participation and labor market insertion is significant in the logistic regression model and in propensity score matching (PSM) model. The association is negative but not significant in the PSM model if standard errors are clustered by bachelor cohorts. The inconsistency in results may be due to measurement error on our labour market insertion variable.

employment database with an active contract. As migration research has shown, people with a migratory experience have an increased propensity for re-taking this step. "Once someone has migrated, therefore he or she is very likely to migrate again, and the odds of taking an additional trip rise with the number of trips already taken" (Massey et al. 1993, 453). Through the experience of mobility, students acquire 'mobility capital' and are likely to look for and take up jobs outside the domestic labour market (Rodrigues 2013; Wiers-Jenssen 2008).

All other things being equal, gender, baccalaureate exam results, the year when the bachelor degree program started, and the receipt of social scholarship (our proxy for socio-economic status) were not predictive of labour market insertion in our analytic sample of UVT graduates. As previous studies have also shown, field of study is predictive of employment status in our analytic sample. Compared to social scientists, humanities and arts graduates and physical education and sports graduates are significantly less likely to have an active work contract, while graduates from natural sciences, mathematics, biology and biomedicine are significantly more likely to have an active work contract. Also, having a master degree is significantly positively associated with labour market insertion. Compared to those who never enrolled in a master degree program, master graduates are twice as likely to have an active work contract in our analytic sample. This finding is in line with human capital theory predictions.

(3) Among those who have an active work contract, does participation in Erasmus mobility predict an above-average salary?

Erasmus mobility is significantly positively associated with earnings. All other things being equal, those who participated in Erasmus mobility during their studies at UVT were 75% more likely to have a higher-than-average monthly salary[8] associated with their active work contract. Results from the propensity score matching model (with the same specification as the logistic regression model discussed above) also suggest that participation in Erasmus mobility is positively associated with an above-average monthly salary among those UVT graduates who had an active contract.

Comparing mobile UVT graduates, the duration of study abroad is not predictive of differences in earnings. In other words, there was no statistically significant difference in the likelihood of having an above-average salary, regardless of whether the mobile student experienced a short-term mobility period (operationalized as 5 months or less), or a long-term Erasmus mobility period (operationalized as more than 5 months). The year in which students participated in Erasmus credit mobility is predictive of earning differences. The year of mobility is negatively associated with earnings, that is, among mobile UVT graduates, the likelihood of having an above-average salary decreases with every academic year. This finding is consistent with the expectation that, over time, as Erasmus mobility became more and more common, it became less valuable in accessing higher-paid positions. Alternatively, the negative relationship could be explained by the fact that students who went on

---

[8]Please refer to Table 2 for details on how we operationalized higher-than-average monthly salary.

Erasmus earlier have had more time on the labour market, and their longer work experience explains their higher likelihood of having higher-paid positions.

(4) Among those who have an active working contract, does participation in Erasmus mobility predict having a managerial or professional occupation?

Prior research found that "five to ten years after graduation, significantly more Erasmus alumni (64%) than non-mobile alumni (55%) hold a management position. The difference is especially large in Eastern Europe (70% compared to 41%)" (European Commission 2016). Contrary to the expectation of higher occupational prestige, in our analytic sample, Erasmus mobility is not predictive of a more prestigious occupational category. All other things being equal, those who participated in Erasmus mobility during their studies at UVT were not more likely to have an active work contract with a managerial or professional occupation. The results from the propensity score matching model (with the same specification as the logistic regression model discussed above) also suggest that participation in Erasmus mobility is not associated with managerial or professional occupations among UVT graduates with an active work contract. Our result might be explained by the fact that higher education attainment in Romania is the lowest in the European Union and, as such, having a tertiary degree per se is highly valued by employers when they are looking to fill managerial or professional positions. Nevertheless, the mechanisms of obtaining a higher status job may be underspecified in our model. Further research should look into the micro-causalities at play on the local labour market as they might provide an explanation for these findings.

Within the sub-group of mobile UVT graduates, the duration of study abroad is not predictive of occupational category either. In other words, both short- and long-term Erasmus mobility periods are associated with a similar likelihood of holding a managerial or professional job. The year of mobility is not associated with the occupational category either: the likelihood to have a managerial or professional position is the same irrespective of the academic year in which the Erasmus mobility took place.

5   Conclusion: Benefits and Limitations of Register Data

In this chapter, we analysed a unique dataset from Romania to illustrate how register data can be used to answer questions about the benefits of Erasmus credit mobility. We found that the typical UVT graduate who participated in Erasmus mobility and then got employed in Romania after graduation is a woman who has a bachelor degree in social sciences or in humanities, who did not receive a social scholarship but received a merit-based scholarship, who enrolled at one point in time in a master degree program at UVT, and who has a managerial or professional occupation.

In terms of labour market outcomes, our analyses indicate that, all else being equal, participation in Erasmus mobility is (1) significantly negatively associated with insertion in the domestic labour market; (2) significantly positively associated

with above-average income among those who do work for an employer operating in Romania, and (3) not predictive of a managerial or professional occupational category.

Working with register data is resource-efficient, but it has its own limitations. Findings presented in this chapter are limited to graduates of a single university in Romania, as a spin-off from an institutional, ITC intensive, tracer study (Proteasa et al. 2018). The limitations of the Romanian employee register are reflected into our findings: as the national registry includes only labour contracts, the results may be less relevant for fields in which self-employment is common, such as law, psychology and even computer sciences. A further limitation of using data from a single national register is that we had no employment information about graduates who were employed outside of Romania. The tracer study used interval measures of graduates' salaries (Proteasa et al. 2018), which makes the measurement of our earnings data less precise. And while working with data from ReviSal allowed us to observe the labour market outcomes of more UVT graduates than would have been possible with the use of an alumni survey, our analytic dataset still misses information about theoretically important characteristics of the UVT graduates, such as their marital status, number of children, and the educational background of their parents.

Nevertheless, register data shows promising avenues for research and encourages the efficient use of resources by using data that is already collected for administrative purposes both at the national and institutional level. The availability of register data enables researchers to test linkages between higher education and a wide range of individual institutional and societal outcomes. At the very least, register data can provide researchers with good descriptive population parameters from which samples can be drawn for further research. Ministries and higher education institutions should consider these benefits when evaluating requests for data release for research purposes.

References

Altbach, P. G. (2005). Globalization and the University: Myths and Realities in an Unequal World. *The NEA 2005 Almanac of Higher Education*, 63–74.

Håkan, A., & Nilsson, S. (2016). Labour Market Prospects after Tertiary Education. Sweden in an International Perspective - A Comparison Based on Education at a Glance. Swedish Higher Education Authority (UKÄ). Stockholm.

Barblan, A. (2002). Academic Co-Operation and Mobility in Europe: How It Was and How It Will Be. *Higher Education in Europe, 27*(1–2), 31–58.

Bikson, T. K., Treverton, D. G. F., Treverton, G. F., Moini, J., & Lindstrom, G. (2003). New Challenges for International Leadership: Lessons from Organizations with Global Missions.

Bowman, N. A., & P. L. Hill. (2011). Measuring How College Affects Students: Social Desirability and Other Potential Biases in College Student Self-Reported Gains. In S. Herzog & N.A. Bowman (Eds.) *Validity and Limitations of College Student Self-Report Data* (pp. 73–85). San Francisco: Jossey-Bass.

Bracht, By Oliver et al. (2006). The Professional Value of ERASMUS Mobility.

Brooks, R., & J. Waters. (2011). *Student Mobilities, Migration and the Internationalization of Higher Education*. Basingstoke: Palgrave Macmillan.

Canto, S., Jauregi, K., & van den Bergh, H. (2013). Integrating Cross-Cultural Interaction through Video-Communication and Virtual Worlds in Foreign Language Teaching Programs: Is There an Added Value?. *ReCALL, 25*(1), 105–121.

Crăciun, D., & Orosz, K. (2018). EENEE Analytical Report No.36 Benefits and Costs of Transnational Collaborative Partnerships in Higher Education. Brussels.

European Commission. (2014). The Erasmus Impact Study: Effects of Mobility on the Skills and Employability of Students and the Internationalisation of Higher Education Institutions.

European Commission. (2016). The Erasmus Impact Study Regional Analysis: A Comparative Analysis of the Effects of Erasmus on the Personality, Skills and Career of Students of European Regions and Selected Countries.

European Commission. (2017). Erasmus+: 30 Years in the Making. Factsheets.

European Commission. (2018a). Education and Training Monitor 2019: Romania.

European Commission. (2018b). Erasmus+: The EU Programme for Education, Training and Sport (2014–2020).

Guruz, K. (2008). *SUNY Press Higher Education and International Student Mobility in the Global Knowledge Economy*. Albany: State University of New York Press.

Guvernul României. (2011). Hotărâre Nr. 500 Din 18 Mai 2011 Privind Registrul General de Evidenţă a Salariaţţilor. Monitorul Oficial (372).

King, R., Allan, F., & Jill, A. (2010). International Student Mobility Literature Review.

Koda, Y., & Takako, Y. (2013). The Labor Market Outcomes of Two Forms of Cross-Border Higher Education Degree Programs between Malaysia and Japan. *International Journal of Educational Development, 33*(4), 367–379.

Llanes, À., Arnó, E., & Mancho-Barés, G. (2016). Erasmus Students Using English as a 'Lingua Franca': Does Study Abroad in a Non-English-Speaking Country Improve L2 English?. *Language Learning Journal, 44*(3), 292-D-303.

Massey, D.S. et al. (1993). Theories of International Migration: A Review and Appraisal. *Population and Development Review, 19*(3), 431–466.

Matherly, C. (2005). Effective Marketing of International Experiences to Employers. In Tillman M. (Ed.) *Impact of Education Abroad on Career Development, pp. 9–10*, Vol. 1.

Messer, D., & Wolter, S. C. (2007). Are Student Exchange Programs Worth It? *Higher Education, 54*(5), 647–663.

Ministerul Educatiei Nationale. (2019). Bacalaureat.

Nilsson, S. (2017). Employability, Employment and the Establishment of Higher Education Graduates in the Labour Market. In M. Tomlinson & L. Holmes (Eds.), *Graduate Employability in Context. Theory, Research and Debate, pp. 65–85*, London: Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-57168-7_3.

OECD. (2006). Education at a Glance: OECD Indicators. Paris.

OECD. (2017). Education at a Glance: OECD Indicators. Paris.

Orr, D., Gwosc, C., & Netz, N. (2011). Ocial and Economic Conditions of Student Life in Europe. Synopsis of Indicators. Final Report. Eurostudent IV 2008–2011. Bielefeld: W. Bertelsmann Verlag.

Parey, M., & Waldinger, F. (2011). Studying Abroad and the Effect on International Labor Market Mobility: Evidence from the Introduction of ERASMUS. *Economic Journal, 121*(551), 194–222.

Di Pietro, G. (2012). Does Studying Abroad Cause International Labor Mobility? Evidence from Italy. *Economics Letters, 117*(3), 632–635. https://doi.org/10.1016/j.econlet.2012.08.007.

Di Pietro, G. (2013). Do Study Abroad Programs Enhance the Do Study Abroad Programs Enhance the Employability of Graduates'? Bonn.

Di Pietro, G. (2015). Do Study Abroad Programs Enhance the Employability of Graduates? Education Finance and Policy 10(2): 223–43.

Di Pietro, G. (2019). University Study Abroad and Graduates' Employability.

Proteasa, V., Bleotu, C., & Fierăscu, S. (2018). UVT Si Piata Muncii. Studiu Privind Angajabilitatea Absolventilor Universității de Vest Din Timisoara UVT and the Labour Market. A Study on the Employability of the Graduates from West University of Timisoara. angajabilitate.uvt.ro.

Rodrigues, M. (2013). Does Student Mobility During Higher Education Pay? Evidence From 16 European Countries.

Rubio, E. (2019). New Beginnings: An EU Budget in Support of the Next Commission's Agenda. Paris, Berlin.

Schnepf, S. V., & D'Hombres, B. (2018). Ternational Mobility of Students in Italy and the UK: Does It Pay off and for Whom?

Souto-Otero, M. (2008). The Socio-Economic Background of Erasmus Students: A Trend towards Wider Inclusion? *International Review of Education, 54*(2), 135–154.

Souto-Otero, M., & McCoshan, A. (2006). Survey of the Socio-Economic Background of Erasmus Students: Final Report to the European Commission. Birmingham.

Teichler, U., Ferencz, I., & Wächter, B. (2011). Mapping Mobility in European Higher Education Vol.1. Brussels.

Teichler, U., & Janson, K. (2007). The Professional Value of Temporary Study in Another European Country: ERASMUS Students THE IMPACT OF TEMPORARY STUDY ABROAD. *Journal of Studies in International Education, 11*(3), 486–495.

Varghese, N. V. (2008). Globalization of Higher Education and Cross-Border Student Mobility. Paris.

Wiers-Jenssen, J. (2008). Does Higher Education Attained Abroad Lead to International Jobs? *Journal of Studies in International Education, 12*(2), 101–130.

Wiers-Jenssen, J. (2011). Background and Employability of Mobile vs. Non-Mobile Students. *Tertiary Education and Management, 17*(2), 79–100.

Wiers-Jenssen, J., & Try, S. (2005). Labour Market Outcomes of Higher Education Undertaken Abroad. *Studies in Higher Education, 30*(6), 681–705.

Zaiceva, A. (2014). The Impact of Aging on the Scale of Migration: Older People Migrate Less than Young, yet with Population Aging, Mobility of Elderly and Specialized Workers May Increase.