Does student mobility during higher education pay? Evidence from 16 European countries

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Abstract

Studying abroad for a period of time during higher education has become an important phenomenon, but its effects are seldom studied in economic research. We tackle this research gap using a survey of higher education graduates in 16 European countries and by examining the effects of student international mobility on the school-to-work transition, employability and earnings. Methodologically, a multivariate regression setting is complemented with a novel procedure aimed at evaluating the robustness of the results to omitted variable bias.

The main findings at the pooled level show that student mobility slightly delays the transition to the first job and has no effect on employability and on earnings. The country-level analysis points in the same direction but reveals substantial heterogeneity of effects, as significant effects are limited to a few countries. In some countries there is evidence of a positive effect on earnings. We discuss heterogeneous effects, potential mechanisms, reasons for cross-country heterogeneity and policy implications derived from our findings.

Keywords: Student mobility, Higher education, Labor market, Europe
JEL codes: I2, J61

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1. Introduction

Studying abroad for a period of time during higher education has become an important phenomenon and a relatively common experience in Europe in recent decades. These international experiences encompass language courses, summer schools, or more structured programs such as Erasmus, in which students aim to earn credit toward their degree in their country of origin. The percentage of students studying abroad under Erasmus alone has increased by an average of 5.5% annually since 2000 (DG EAC), and more than 3 million students have participated in the program since it began in 1987. At the European level, there is a clear effort to promote mobility that will continue into the future, as evidenced by strong policy support and financial incentives (e.g., the *Erasmus+* 2014-2020 Program). Student mobility is usually regarded by stakeholders as an advantage *per se*, and it is promoted on the grounds that it contributes to personal development, the enhancement of competences and career prospects, the development of the European labor market through future international mobility and the promotion of intercultural understanding (Papatsibas, 2006). For instance, *Erasmus+* is expected to contribute to Europe 2020, the EU's reform strategy for jobs and growth.

The striking number of students participating in this type of international experience, the extensive public and private funding involved and the expected future investment in this area fuel the need to understand the impacts of this phenomenon[1]. If the returns on student mobility are not as positive as *a priori* expected, then both public and private funding may not be efficient. Surprisingly, the evidence on the effects of student international mobility is scarce in economic research. Many papers and reports fail to compare mobile with non-mobile students, and most of the contributions are qualitative or anecdotal (Di Pietro, 2015). Only a few use appropriate identification strategies to gauge the causal effects, but these studies are limited to Germany and Italy and only examine the effects on future migration (Parey and Waldinger, 2010, and di Pietro, 2012) and employability (Di Pietro, 2015). They report positive effects on both outcomes; however, whether these positive effects are common to other European countries and to other relevant outcomes is still an open question.

To fill this research gap, this paper assesses the effect of spending *some* time studying abroad during the pursuit of a higher education degree on several labor market outcomes in 16 European countries[2]. We examine its effects on the transition from

[1] Between 1988 and 2013, the European Union spent approximately 5 billion Euros on the Erasmus program alone, and *Erasmus+* 2014-2020 has an allocated budget of 14.7 billion Euros, part of which dedicated to international mobility.

[2] The mobility that is addressed in this paper is short-term mobility in the sense that students are enrolled at a university in the country of origin and obtain a diploma in this country of origin, but they spend some time studying abroad during their higher education studies. This approach contrasts with so-called "degree mobility," which is defined as leaving the country of origin to obtain an entire degree abroad.

education to the labor market, the probability of being employed and hourly earnings five years after graduation. To the best of our knowledge, this is the first paper to inspect the impacts on earnings. Our goal is also to assess any heterogeneous effects by country and in other dimensions, such as duration of the mobility experience and socio-economic background. In addition, we investigate potential mechanisms and discuss potential reasons for the heterogeneous effects found across countries, including causes related to university system characteristics and labor supply and demand.

To address these questions, we use data from surveys of higher education graduates administered in 16 European countries five years after graduation. The same questionnaire was administered in all 16 countries; therefore, the data are directly comparable across countries enabling an analysis both at the European and country levels. Additionally, the data are very rich in terms of student characteristics, which allow us to control for an unusually rich set of covariates. Therefore, a selection on observables approach is implemented by applying multivariate regression analysis. We acknowledge that mobile and non-mobile students could be systematically different in unobserved ways and address this concern by implementing a procedure for evaluating the robustness of our results to omitted variable bias (Oster, 2016). Its novelty lies in the fact that it examines not only the movement in coefficients due to omitted variable bias but also the movement in R-squared values, thus providing a "full adjustment" to omitted variable bias. We show that our results are robust to omitted variable bias as defined in Oster (2016).

We find that, at the European level, student mobility during higher education is associated with a slight delay in entry to the labor market and has no effect on subsequent employability but leads to higher hourly earnings. We find substantial heterogeneity in the results at country level, as significant effects are only observed in a few countries. In terms of other heterogeneous effects, there is some indication that females and graduates from low socio-economic backgrounds tend to benefit more from this type of experience. Finally, while longer stays abroad seem to lead to slightly delayed transitions to work, they result in higher hourly earnings. These findings give rise to important policy implications in terms of the design of student mobility programs, particularly regarding financial support and the length of the period spent studying abroad.

This paper contributes to the existing literature in several ways. First, to our knowledge, this is the first paper to analyze such a research question using a multinational data source. The analysis is conducted at both pooled and country levels, which is essential to understanding whether the benefits are common to all or are limited to only a few countries. Second, we explore heterogeneous effects in several dimensions that have not yet been addressed in the previous literature. For instance, by analyzing the heterogeneity of effects with respect to the duration of the mobility experience, we provide insight into the design of international mobility programs.

Another example is the heterogeneity with respect to socio-economic background, through which we can grasp whether student mobility promotes or hampers equality of opportunity. Third, unlike the few existing papers that analyze the same research question but that focus on either future migration or employability, we examine a wide range of outcomes in terms of labor market performance. Having such a broad perspective is pertinent, as the effects can have different signs depending on the outcome analyzed. The choice of the outcomes results from a combination between what is *a priori* expected to be affected by the mobility experience and what can be measured with the data. Labor market outcomes are clearly potentially affected by student mobility. On the one hand, time spent abroad may be advantageous if it helps a student develop an array of skills that are relevant in the labor market and valued by employers, such as language skills and interpersonal or problem-solving skills. On the other hand, mobile students may be in a disadvantaged position if employers are not familiar with foreign higher education institutions and have doubts about the main motivation to study abroad and whether and which type of competences were obtained. Furthermore, while mobile students may partially lose their home networks, they expand their networks abroad, which may be important if they decide to look for a job abroad. To investigate all of these dimensions of labor market performance, we examine the transition from education to the labor market after graduation and five years after graduation with regard to the probability of being employed and hourly earnings. Of course, mobility can also affect other types of outcomes, including life and job satisfaction and other soft skills such as multicultural understanding and European identity, but these outcomes could not be measured with the available data and are not studied in this paper. Finally, by exploring possible underlying mechanisms and the reasons for cross-country heterogeneity, we provide further insight into what can be done to maximize the positive and minimize any negative effects.

The remainder of the paper is organized as follows. The next section discusses the existing evidence. Section 3 describes the data and the variables employed, whereas Section 4 outlines the empirical methodology. Section 5 presents the results, namely, the heterogeneous effects, and discusses possible mechanisms and reasons for the heterogeneous effects found across countries. Sensitivity analyses are performed in Section 6. The final section concludes.

2. Literature Review

Although the goals of international mobility are well established, the actual determinants and effects of this type of experience have been studied only rarely in the economic literature, primarily due to a lack of data (Krupnik and Krzaklewska, 2006). We refer to Rodrigues (2012) for a thorough overview of the current evidence

regarding the determinants and effects of student mobility. Three well-established findings are discussed therein. First, mobile students are a selective group. One of the most important determinants of mobility is socio-economic background (Di Pietro and Page, 2008; Otero, 2008). Other important factors are foreign language skills and previously acquired *mobility capital* (Murphy-Lejeune, 2002), which is defined as accumulated international experiences that increase the preference for further international experiences and for living abroad. Mobile students are also found to be different in dimensions unobserved to the researcher, namely personality traits, motivation and sense of initiative (Wiers-Jenssen, 2008). This argument is consistent with employers' opinions that mobile students are more proactive and adaptable and are better problem-solvers (Bracht et al., 2006). Second, students consistently report personal development and improved language skills as the most important results of such international experiences, and academic/career benefits are mentioned only secondarily. Erasmus students often report very high levels of satisfaction with the overall international experience (Teichler, 1996). Finally, in terms of impacts on labor market outcomes, Rodrigues (2012) concludes that student mobility appears to have a stronger association with the nature – rather than the success – of a student's future career by making it more international or increasing the probability of working abroad.

The few papers that claim to have identified a causal effect of student mobility are limited to a few countries and outcomes. Using instrumental variables based on variations in the timing of the introduction of the Erasmus program in German universities, Parey and Waldinger (2010) observe that student mobility increases the likelihood of working outside Germany by 15 percentage points (p.p.). Employing a similar identification strategy, di Pietro (2012) reports an effect of between 18 p.p. and 24 p.p. for Italian university graduates. Oosterbeek and Webbink (2009) also find a positive effect of mobility during Master's studies on future mobility. The only paper analyzing labor market returns is that of Di Pietro (2015), who uses the same methodology – but applied to Italy – and demonstrates that mobility increases the probability of being employed three years after graduation by 23 p.p., which is mainly driven by the impact that study abroad programs have on the employment prospects of disadvantaged graduates. Also focusing on the Italian case and using a similar identification strategy, Sorrenti (2015) finds a strong effect of study abroad programs on foreign language proficiency. The only paper analyzing graduates' international experiences using the same dataset as that used here is Teichler (2007), who provides a descriptive analysis and does not aim to assess the causal effects of student international mobility during higher education.

This paper focuses on the effects of international student mobility on labor market outcomes; thus, it is closer to the study by Di Pietro (2015). However, in addition to analyzing the effect on the probability of being employed, we also analyze the school-to-work transition and, perhaps more importantly, hourly wages. To our

knowledge, this paper is the first to show the effects of student mobility on this important dimension. In addition, our paper is unique in the sense that it uses multinational data for 16 European countries and provides heterogeneous effects by country, by duration of mobility and for other dimensions.

3. Data and descriptive statistics

The analysis is performed using data from two projects funded by European Framework Programs: REFLEX (Research into Employment and Professional FLEXibility) and HEGESCO (Higher Education as a GEnerator of Strategic Competences). Both projects use an identical questionnaire and consist of large-scale surveys of higher education graduates five years after graduation. REFLEX was administered in 2005 in 14 countries and surveyed graduates from the 1999/2000 academic year. HEGESCO was conducted in five other countries in 2008 and surveyed graduates from the 2002/2003 academic year[3]. In each country, a representative sample was drawn of graduates from ISCED 5A[4] who obtained their degrees during the corresponding academic year. The questionnaire was sent via post, and the overall response rate was 30%[5]. For each country, the final sample was checked against the population, with only small deviations detected (Allen and van der Velden, 2008, 2009)[6].

For purposes of comparability, we restrict our focus to countries from the European Union and Norway, which comprises a total of 16 European countries[7]. To obtain a more homogeneous sample, we concentrate on respondents who i) were between 17 and 30 years old at the beginning of the higher education program that was eventually successfully completed; ii) started higher education after 1990; and iii) graduated between 1998 and 2004. Table 1 presents the final number of observations – 28,866, i.e., observations with no missing data in the variables used[8]. The distribution of observations by country reveals a clear over-representation of certain countries; therefore, the analysis is performed separately at two levels. First, we pool data from the 16 countries and obtain pooled results. In addition to the individual weights, we

[3] REFLEX was administered in Italy, Spain, France, Austria, Germany, the Netherlands, the UK, Finland, Norway, the Czech Republic, Japan, Portugal, Belgium and Estonia. HEGESCO surveyed Slovenia, Turkey, Lithuania, Poland and Hungary.

[4] ISCED 5A is the international education code for largely theory-based programs that are designed to provide sufficient qualifications for entry into advanced research programs and professions with high skill requirements.

[5] This response rate is line with other European university graduates surveys (e.g. Parey and Waldinger, 2010).

[6] For additional information on the surveys, see the last two references.

[7] Estonia was dropped because crucial variables were missing.

[8] The original number of observations was approximately 37,500. In total, approximately 8,700 observations were dropped for various reasons, including no information on mobility during studies (19% of 8,700), started degree before 1990 (8.9%), were younger than 17 or older than 40 years old (35%), had missing information on parental education (11%), and had other missing information (25%).

apply a weight that forces each country to contribute equally to the pooled average, thus avoiding having results driven by the most represented countries. Second, we perform the analysis at the country level, where only the individual weights are used.

(--- Table 1 ---)

Treatment variable

All of the respondents received their university diplomas from the country in which they were surveyed, and only some of them were mobile, i.e., spent some time abroad during their higher education studies for academic reasons. After this period, all returned home to finish their studies and obtained their degree in the sending country. Given that the sample consists only of university graduates, we measure the added value of mobility.

The questionnaire's item regarding mobility is the following: "Did you spend any time abroad during higher education for study? If yes, for how many months?" In principle, this question encompasses different mobility experiences, such as obtaining credit toward a university degree (e.g., Erasmus), pursuing a language course or attending a summer school[9].

The treatment is a dummy variable, *D*, that equals one if the graduate responded positively and zero otherwise. Table 1 indicates that 19% of the graduates in the sample were mobile during higher education for study-related reasons. It also reports the percentage of mobile students by country, which demonstrates that there are substantial cross-country variations: in Germany, France and Austria, more than 30% of the graduates were mobile, whereas in other countries, this figure is less than 15%[10].

Outcome variables

We are interested in the impacts of the treatment variable on labor-market-related outcomes and for that purpose, three outcome variables are analyzed. *Time to find 1st job* (for those not working during higher education, 71%) is a continuous variable that measures the number of months required to find the first job after graduation. *Employed 5 years* indicates whether the graduate is employed at the time of the survey, and *Hourly Earnings 5 years* (for those working at the time of the survey,

[9] Unfortunately, this is the only information available on mobility. It would be very interesting to ascertain the type of mobility, the country of destination and when during higher education studies that mobility took place.

[10] Comparing the share of mobile graduates in our data and that of other papers is a difficult exercise. Apart from the differences in the data sources, the most important discrepancies are the timing of the survey in terms of years after graduation and the types of mobility considered. The surveys used here had a very general question on mobility, including possibly Erasmus stays, language courses, summer schools, etc. The data used by Parey and Waldinger (2010) and by di Pietro (2012, 2015) use a more conservative and structured type of mobility – international exchange programs. Accordingly, it is not surprising that the percentage of mobile students is higher in our paper - while Parey and Waldinger (2010) report that 14% of German students were mobile, in our data this figure is 31%; comparing with di Pietro's papers, the corresponding figures are 5-7% and 16%.

90%) is the logarithm of hourly gross earnings[11]. This metric is commonly used to measure productivity. The averages and standard deviations of these variables are presented in the last columns of Table 1.

Table 2 instead reports the outcomes means differences between mobile and non-mobile graduates. At the European level, we see the following patterns: i) on average, mobile graduates require 0.6 months longer to find their first job after graduation than non-mobile graduates; ii) five years after graduation, there is no difference in the probability of employment between mobile and non-mobile graduates, but the former earn 16% more per hour, which corresponds to 1.50€. There are wide differences in this pattern across countries, and, in fact, the differences found in the pooled sample seem to be driven by only a few countries.

(--- Table 2 ---)

Covariates

The data allow us to control for important graduate-specific characteristics, which is crucial for the identification strategy applied. These characteristics are clustered in three different groups. The first encompasses contextualizing variables, namely, country, year of survey, year of program beginning and year of graduation dummies. The second group includes variables that are determined prior to the mobility experience during higher education and have proven to be important determinants of mobility in the literature. These include i) demographic variables (gender, age at the beginning of the program[12], highest parental level of education); ii) mobility capital variables (whether the graduate is an immigrant, whether the graduate has immigrant parents and whether he lived in a country at age 16 other than the one in which he graduated); and iii) variables related to secondary education (whether the secondary degree had a general orientation, i.e., mainstream versus vocational, and the grade received at this educational level, which can be interpreted as a proxy for ability[13]). Finally, the third set of explanatory variables is formed by a set of variables that are related to higher education, namely, dummies for field of degree, whether the degree provides access to a PhD, whether the program was attended on a part-time basis and variables related to the activities carried out during that period: whether the graduate worked in an internship as part of the program, had working experience or participated in a volunteer organization and interactions between these. We acknowledge that the latter variables *can* be endogenous because they may have resulted from the same decision process as mobility and/or may have been affected by the mobility experience.

[11] Gross earnings are already provided in the data and are corrected for inter-country differences in purchasing power.

[12] Mobility during higher education could potentially affect the time until the program is completed; therefore age at the beginning of the program was deemed preferred because it is clearly a pre-treatment characteristic.

[13] These grades are measured in national scales; for each country, we divide the graduates into mutually exclusive groups according to the level obtained or to the grade percentiles and a further group for observations with missing grades (on average, only 4% are missing).

Although these variables *may* not necessarily be pre-determined, we argue that some of them are correlated with typically unobserved graduate-specific characteristics, such as proactivity, motivation, and ability to cope with a heavy workload. By controlling for these variables in addition to parental background, mobility capital, and the students' grades in secondary education, we are controlling for the main drivers of mobility, and therefore, unobserved heterogeneity is substantially decreased. This issue is further discussed in the next section.

Table 2 shows the test for the equality of some of the covariates' means between mobile and non-mobile groups. At the European level, we see that mobile and non-mobile graduates differ significantly in all of the observed characteristics except gender. The most striking differences, amounting to approximately 15 p.p., are related to the education of the parents and volunteer work. Mobile graduates are also more likely to have completed an internship (4 p.p.), to have had work experience (11 p.p.), to have followed a mainstream education (5 p.p.) and to have completed a university degree that provides access to a PhD (13 p.p.). There is some cross-country heterogeneity, but overall, we also observe significant differences in parental education and volunteer activities in all of the countries, except Lithuania. The country-level analysis allows us to compare secondary education grades between the two types of graduates, finding different selectivity into mobility in this respect. Mobile graduates had significantly lower grades in secondary education than their non-mobile counterparts in Germany, the Czech Republic and Lithuania. In the majority of the countries, this difference is positive and significant, but it is especially high in Norway, Poland and Finland. In the Netherlands and Hungary, such a difference does not seem to exist.

All of these differences demonstrate that there is selection into mobility, thus reinforcing the idea that it is important to control for all of this information when attempting to decrease unobserved heterogeneity.

4. Empirical Methodology

4.1 - Multivariate regression analysis

In this paper, we focus on the effect of mobility during the course of higher education on the career outcomes of the students. Within the class of selection of observables, we use the multivariate regression analysis:

$$Y_i = \alpha + \beta D_i + \gamma \boldsymbol{X_i} + \varepsilon_i,$$

where Y_i is the outcome of interest, D_i is the treatment variable indicating whether the graduate was or was not mobile during higher education studies, and $\boldsymbol{X_i}$ is the vector of observable characteristics that are controlled for and are described above. Our main

interest is to obtain unbiased and consistent estimates of β [14]. We use OLS for all three of the outcomes, although the probability of being employed five years after graduation is binary. This approach is used to enable us to compare these results with those using the Oster (2016) method, described below, which only applies to linear models.

4.2 – The Conditional Independence Assumption

The coefficients resulting from OLS are interpreted as causal effects if the Conditional Independence Assumption (CIA) is valid. In the context of "selection of observables," this means that, after controlling for the set of variables included in the regression, the decision to study abroad during higher education is random.

Even if the CIA is not directly testable, we argue that it is very likely to be valid because our covariates capture crucial mobility drivers. First, we control for parental level of education, which is certainly associated with parental income. The latter may be an important financing source for a study abroad experience and parental education is also likely to be related to the importance and support that parents give to this experience, for instance, by searching for information (e.g., searching for potential courses or summer schools abroad, for accommodations, or for other financing sources) or helping the students fill out applications. Second, we control for variables related to *mobility capital*, defined above. In particular, we control for whether the graduate lived abroad at age 16 and for migrant background. Third, we control for secondary education (SE) grades, interpreted as a proxy for ability. Fourth, we also control for other events during higher education that are related to students' degree of openness, pro-activity, ability to cope with a heavy workload, and willingness and motivation for new experiences. We take into consideration internships and work experience during higher education. However, these factors may also be related to the need to finance higher education; therefore, we also control for volunteer activities during higher education, which we actually find to be one of the most important determinants of student mobility. Finally, we also control for the field of the higher education degree because this factor is associated with systematic differences in the probability of studying abroad and in the outcomes analyzed.

Of course, the existence of unobservable characteristics that may yet bias the estimated treatment effect is a possibility that cannot be ruled out completely. Accordingly, in the next sub-section, we present a novel method proposed by Oster (2016) that investigates the robustness of our results to omitted variable bias. But first, it is relevant to reflect on what drivers of mobility could still be omitted and how they could impact the effect of student mobility on the outcomes. Let this unobserved factor be summarized as the motivation to study abroad, which can be *a priori* positively or

[14] We attempted to instrument mobility using the date of the introduction of the Erasmus program in each country. As expected, the date of introduction was a weak predictor of individual mobility; therefore, we selected the OLS approach complemented by the Oster (2016) procedure.

negatively related to labor market outcomes. In the former case, the main motivation to study abroad would be the desire to add a different experience to one's curriculum and to obtain skills and competences that can be developed abroad, such as language skills, interpersonal understanding, and the ability to handle ambiguity, among others. In this case, by omitting this factor, we would be over-estimating the effect of student mobility. In the latter case, the main motivation would not be related to specific academic goals but rather to the fun and excitement it offers (Di Pietro, 2014). Thus, we would be under-estimating the labor market returns of studying abroad, and controlling for this extra factor would in fact move the estimates away from zero.

4.3 – Omitted variable bias and bounding values (Oster, 2016)

In this section, we present the novel methodology developed by Oster (2016) to assess the robustness of the results to omitted variable bias. Her starting point is the common procedure of observing the movement of coefficients after the inclusion of controls, assuming that selection on observables is informative of selection on unobservables. Building on Altonji et al. (2005), she contributes crucially to this stream of literature by acknowledging, proving and formalizing the idea that R-squared movements should also be taken into account when studying omitted variable bias. An estimator for this bias is developed under a proportional assumption between selection on observables and unobservables, thus providing a formal way to relate the coefficient *and* R-squared movements to omitted variable bias. Her suggestion is to obtain bounds of the effects of interest and estimate the degree of selection on unobservables that would completely confound the originally estimated effect.

We start by defining some important notions and concepts that are necessary to understand and interpret the procedure. Next, we present the implementation techniques and the standards for robustness.

Consider the following regression model (indices omitted for convenience):

$$Y = \beta D + W_1 + W_2 + \varepsilon$$

where W_1 and W_2 are a linear combination of observed and unobserved control variables multiplied by their coefficients. W_1 and W_2 are assumed to be orthogonal, i.e., $cov(W_1, W_2) = 0$[15]. ε is assumed to be orthogonal to D, W_1 and W_2.

The selections on observables and unobservables are related in a proportional way. Define the proportional selection assumption as:

$$\delta \frac{Cov(W_1, D)}{Var(W_1)} = \frac{Cov(W_2, D)}{Var(W_2)}$$

where δ is the coefficient of proportionality, which indicates how large the relative selection on observables and unobservables is. δ=1 implies equal selection on

[15] Given that it is assumed that observables and unobservables are related, this orthogonality may be strange at first glance. However, it can simply be interpreted as W_2 containing variables after they are residualized with respect to W_1.

observables and unobservables. If δ>1 (δ<1), then selection on unobservables is stronger (weaker) than selection on observables.

Denote the coefficient and R-squared of a regression only controlling for the treatment variable (i.e., $Y = \beta D + u$) as $\dot{\beta}$ and $\dot{R}$, respectively, and denote the main coefficient and R-squared of a regression adding observables W_1 as controls (i.e., $Y = \beta D + W_1 + u$) as $\tilde{\beta}$ and $\tilde{R}$, respectively. Notice that the latter are the values obtained from the specification presented in Section 3.1 and are the main focus of this paper.

In terms of implementation, Oster (2016) proposes two techniques to test the robustness of the estimated effect. In both procedures, one has to define a priori R_{max}, which is the maximum variation in the outcome that can be explained by controlling for both W_1 and W_2. This value would be the R-square resulting from the baseline regression $Y = \beta D + W_1 + W_2 + u$. One natural R_{max} is 1, but it is plausible to assume that the value is lower because the variation in Y is partly due to an idiosyncratic component that cannot be explained by either W_1 or W_2. Based on randomized data, it is argued that a useful bound is $R_{max} = \min\{1.3\tilde{R}, 1\}$. However, because the R-squared values obtained in our case are rather small, we use a more conservative and demanding bound for R_{max} and set it to be twice that obtained in the controlled estimation, i.e., $R_{max} = \min\{2\tilde{R}, 1\}$. Thus, we impose unobserved variables W_2 to explain twice the variation of Y that is explained by the treatment variable D and the observed controls W_1.

The first implementation technique consists of calculating the value of the degree of proportionality $\hat{\delta}$ that would lead to a treatment level of zero. Oster (2016) shows that:

$$\hat{\delta} \approx \frac{(\tilde{\beta} - \hat{\beta})(\tilde{R} - \dot{R})}{(\dot{\beta} - \tilde{\beta})(R_{max} - \tilde{R})}$$

Basically, this technique answers the question of how large the relative selection on observables and unobservables would need to be to produce $\hat{\beta} = 0$, which is equivalent to the estimator developed by Altonji et al. (2005). Following these authors, Oster (2016) argues that a value of δ=1 may be a heuristic cutoff for two main reasons. First, W_2 is residualized with respect to W_1. Second, the control selection is not random and researchers introduce variables that could confound the effect of interest. Therefore, it is likely that the [0,1] bound would fit, and the most conservative bound of 1 is chosen. Accordingly, a value of $\hat{\delta} > 1$ is viewed as evidence that the controlled estimator $\tilde{\beta}$ is not significantly harmed by omitted variable bias. Notice that δ is not imposed to be positive or negative. Following the discussion at the end of Section 4.2, in our case, positive or negative values may make sense. A negative value implies that, to explain away the effect found, the selection on unobservables must be of the opposite direction

of the selection on observables. Therefore, our standard will be to check whether the *absolute value* of δ is higher than one.

The second implementation technique is to calculate the bias-adjusted effect, β^*, and a bounding set under a specific level of the degree of proportionality. It can be shown that:

$$\beta^* = \tilde{\beta} - \delta[\dot{\beta} - \tilde{\beta}]\frac{R_{max} - \tilde{R}}{\tilde{R} - \dot{R}}$$

converges in probability to the true β if δ=1 and is a good approximation of β if δ is not very far from one. See Oster (2016) for details on the estimation of β^* if δ≠1. In this second technique, in addition to R_{max}, one must specify a level for δ. Following the same arguments discussed above, a value of δ=1 is chosen. The bounding set is then defined as $\Delta_s = [\tilde{\beta}, \beta^*(\min\{2\tilde{R}, 1\}; 1)]$. Empirically, the question of interest in considering Δ_s is whether the conclusions based on the full set of variables, would be similar to those drawn from observing only $\tilde{\beta}$. This question can be assessed in two ways. The first is to check whether the bounding set includes zero. This question is natural, and, if it does, then selection on unobservables explains away the effect found in the controlled estimator $\tilde{\beta}$. Of course, this approach is only informative in cases where the inclusion of controls moves the coefficient toward zero. The second way is to check whether the bounds of the set fall within the confidence interval (+/- 2.8 standard errors) of the controlled estimator $\tilde{\beta}$. This approach can be used regardless of the direction of movement, i.e., including results where the controls move the coefficient away from zero, and is particularly informative in this case. This second standard is basically a test of whether the magnitude conclusions from the controlled estimate still make sense in the adjusted estimate.

5. Results

In this section, we start by presenting the main results of the paper derived from the multivariate regression models and the Oster (2016) method. Next, we discuss and explore possible reasons for the heterogeneity of effects found across countries. Thereafter, we examine the existence of the heterogeneous effects, particularly by gender, parental education and duration of mobility. Finally, we study potential mechanisms through which student international mobility may affect the labor market outcomes considered here.

5.1 Estimated effect of mobility during higher education on outcomes

The results from the multivariate regression analysis and from the Oster (2016) method are presented in Tables 3 to 5, one for each outcome variable. Columns (1) and

(2) present the coefficients and R-squared values when only the treatment variable and some contextualizing variables are included[16], i.e., $\dot{\beta}$ and $\dot{R}$. Columns (3) and (4) present the same figures but when all of the other observable characteristics are added as explanatory variables, i.e., $\tilde{\beta}$ and $\tilde{R}$. These are the coefficients that will be tested against omitted variable bias. The last four columns are derived from the Oster (2016) method[17]: (5) the bounding set, in which one of the bounds is the same figure as in the third column and the other bound is β^*, i.e., the value of beta obtained when $R_{max} = \min\{2\tilde{R}, 1\}$ and δ=1; (6) an indicator of whether the bounding set excludes zero – Yes/No; (7) an indicator of whether the bounding set is included in the confidence interval of the controlled estimator ($\tilde{\beta}$) – Yes/No; and (8) the value of delta that would deliver a treatment effect of zero.

(--- Table 3, 4, 5 ---)

A first glance through the controlled estimates reveals that mobility during studies has a significant effect on the time required to find the first job after graduation in only a few countries (Poland, France, the Czech Republic, the Netherlands, Slovenia and Belgium). The probability of being employed five years after graduation is significantly affected in two countries, Austria (4.6 p.p.) and Portugal (8.6 p.p.), and is insignificant in all others. We find that the positive and significant effect on hourly earnings in the pooled sample (4%) is only validated in Poland (18%), Italy (12%), the Czech Republic (10%) and Spain (8%). Interestingly, in the Netherlands, mobility is associated with a 3% decline in hourly earnings. The results for each outcome variable are discussed in detail separately in the following sub-sections.

Time to find the first job after graduation (Table 3)

At the pooled level, the baseline model indicates that student mobility increases the time to find the first job by 0.87 months, with an R-squared of 0.052. In the controlled estimation, the same figures are 0.66 and 0.094, respectively, indicating that a small movement in the coefficient is accompanied by a large increase in the R-squared, which almost doubles. The bounding set for this effect does not include zero, and it is within the confidence interval. Additionally, the necessary delta to have a treatment effect of zero is above one. According to Oster (2016), this estimate can therefore be considered robust against omitted variable bias.

At the country level, the significant effects are restricted to Lithuania (where the search time is decreased by student mobility) and to France, the Netherlands, the Czech Republic, Belgium, Slovenia and Poland (where the search time is increased). In particular, the effect ranges from slightly less than 1 month in Poland to 3 months in

[16] These include dummies for country, year of survey, year of program beginning and year of graduation dummies.
[17] The method is applied using the Stata command provided by the author: pscalcv2.

Belgium. As for the pooled case, we conclude that omitted variable bias does not seem to be a significant threat to the estimates for these countries, except for Poland and Austria, where the deltas are -0.2 and -0.7, respectively.

This slightly delayed transition into the labor market might be a consequence of several mechanisms, some of which may not necessarily be negative. First, it is possible that the mobile graduates lose their professional networks in their home country, which may be exacerbated if the mobility period is long and occurs closer to the end of the degree rather than at the middle. Second, it is also likely that mobile graduates develop a preference for internationality (mobility capital) and search for a job abroad. Such a search may take longer than for those focusing on the domestic labor market, as it may be challenging to identify the best sources for vacancies, to complete the application process, etc. Third, mobile graduates may feel that they have more job options available to them and decide to take longer to find the best alternative because they have higher reservation wage.

Probability of employment five years after graduation (Table 4)

In general, student mobility does not significantly affect the probability of being employed five years after graduation. At the pooled level, the effect is less than 1 percentage point and is not significant. The only two countries showing a significant effect are Austria and Portugal, where student mobility increases this probability by 4.6 and 6.9 percentage points, respectively. The results following Oster (2016) for these two countries suggest their robustness to omitted variable bias, with well-behaved bounding sets and deltas around -3. Also taking into account the countries for which the effect is not significant, we conclude that it is not likely that unobserved heterogeneity drives the results. In some of the countries, the coefficient is negative, suggesting worse employment prospects for graduates who were mobile (France, Germany, the UK, Belgium, Slovenia, Lithuania, and Poland), but the results for these countries are imprecisely estimated.

Hourly earnings five years after graduation (log) (Table 5)

At the pooled level, the baseline model indicates that student mobility increases hourly earnings by 5.1%, with an R-squared of 0.296, and when all of the other controls are added, these figures are 4% and 0.334, respectively. Clearly, in this case, a small movement in the coefficient does not accompany a substantial increase in the R-squared. This combination of factors causes doubt about the robustness to potential unobserved heterogeneity. In fact, the identified set includes zero and is outside the confidence interval of the controlled estimate; and the delta is smaller than 1. Therefore, this result is very likely to suffer from omitted variable bias, and we do not give it a causal interpretation. Accordingly, our focus moves to the results at the country level.

Combining the information from columns (6) to (7) of Table 5, we observe that the estimates for Italy, Spain, Germany, the Netherlands, the UK, the Czech Republic, Belgium, Lithuania and Poland are robust to omitted variable bias. It is important to emphasize that the countries in which student mobility significantly affects earnings are among this set of countries. Interestingly, it seems that in the Netherlands, student mobility leads to lower earnings of approximately 3%. In the countries with significant and positive estimates, the coefficients range from 8% in Spain to 18% in Poland. It should be highlighted that these earnings increases are substantial; corresponding to approximately two to four times the traditional returns from an additional year of schooling[18].

The effects on hourly earnings suggest that student international mobility increases the productivity of graduates and that it may lead to relatively higher-wage careers, such as working in the private sector or in firms with international operations. We will explore these mechanisms in subsection 5.4.

5.2 Discussion of cross-country heterogeneity

The main conclusion from the analysis thus far is that the labor market returns from student international mobility should not be generalized because the results do not identify a positive overall effect and are only observed in a few countries. Student international mobility may not only lead to longer university-to-work transitions, but the positive effects on earnings are observed in only half of the countries. This result implies that policy makers should be careful when advocating the positive labor market effects of this type of experience.

These heterogeneous effects across countries may be affected by the relative quality of higher education systems and the labor supply of and demand for international experiences. Whereas further research should conduct in-depth analyses to clarify the differences across countries, we explore some potential reasons for the differences observed at the country level. In particular, we examine the role of the quality of universities across countries, the labor supply of graduates with mobility experience and the value that employers attribute to this type of experience. Table 4 presents the correlations between the effects from Tables 3 to 5 (main effects- $\tilde{\beta}$) and the variables mentioned above.

(--- Table 6 ---)

First, the heterogeneous effects at the country level may be related to the main destination countries and specifically to the relative quality of their university systems.

[18] If a less conservative R_{max} is used, as suggested by Oster (2016), i.e., $R_{max} = \min\{1.3\tilde{R}, 1\}$, only the pooled estimates and those for Slovenia and Portugal would not be regarded as robust to omitted variables bias.

Students from high- (low-) quality higher education systems may benefit less (more) from an international experience. Although the country of destination is not available in the data, outgoing Erasmus data (DG EAC) reveal that, in general, the main destinations are Spain, France and Germany, and these countries appear in the middle of the rankings of national higher education systems among the countries analyzed in this paper (Universitas 21, 2012). A country's university system ranking is particularly correlated with effects on hourly earnings (-0.541**). The negative sign indicates that, as expected, the estimated effect of mobility is higher for countries with lower university quality.

Second, with regard to the labor supply, the effects can be related to how common student international mobility is among the pool of graduates, which is assessed using the percentage of mobile graduates per country, presented in Table 1. The signs of the correlation are as expected but are not significantly different from zero. However, it is reassuring that the higher the percentage of mobile graduates in a country is, the more time that is required to find the first job and the lower the hourly earnings are.

Finally, regarding labor demand, one reason for the heterogeneous effects may involve how employers evaluate mobility experiences and how they rank such experiences against other graduate characteristics. The Eurobarometer on the "Employer's perception of graduate employability" (European Commission, 2010) asks employers from each country about the importance attributed to a study period abroad. The percentage of employers that answered "strongly disagree" is positively correlated with the time to find the first job and negatively correlated with employment prospects and hourly earnings five years after graduation. Although none of these correlations are significant, this evidence suggests that employers' perceptions and preferences may indeed be a contributing factor in the effects of student mobility.

5.3 Heterogeneous effects

In this section, we explore potential effect heterogeneity. The above results present average effects for different groups of individuals, but relevant differences may arise when these groups are disaggregated. We explore the heterogeneous effects by gender, socio-economic background (SES), and duration of the international experience[19]. While a deeper analysis of these results is presented in the appendix, here we provide an overview of the main patterns found.

In general, the effect of student mobility on labor market outcomes is not restricted to any one of the groups considered. While it should be stressed that the

[19] For each domain, graduates are divided in two groups: male and female; low and high socio-economic background determined by parental education; and duration of mobility of less and more than 6 months. See appendix for details.

heterogeneous effects are somewhat different across countries, we find some indications of general patterns that are worth emphasizing here. First, the effect of student mobility on the required time to find the first job after graduation seems to be higher for males, for those with a high SES, and for those who stayed abroad longer. Second, the effect on the probability of being employed five years after graduation is higher for females, for low SES and for those with shorter stays abroad. Finally, hourly earnings seem to be slightly more affected by student mobility for low parental education graduates and for those with longer stays abroad. With regard to policy implications, the heterogeneous effects by parental background and duration of mobility are particularly informative. The fact that disadvantaged graduates benefit from this experience may be a reason to tackle their barriers to mobility, particularly financial barriers. In addition, while longer stays abroad may lead to slightly delayed transitions to work, they may be necessary to allow for the development of the relevant skills that can be acquired from this experience (for instance, language skills) and to reap the monetary returns from it.

5.4 Possible mechanisms

The mechanisms underlying the effects of student mobility can be manifold, as previously discussed in subsection 5.2. In this subsection, we assess the role of potential mechanisms that can be analyzed based on the data at hand by considering them as outcomes in the methodology presented above[20].

One important mechanism is students' foreign language skills, which are expected to be improved by student mobility. In the survey, respondents are asked to report their ability to write and speak a foreign language at the time of the survey. We indeed find that being mobile during higher education is associated with a one-category (out of five) increase in this self-reported ability (0.947***[0.031]). This mechanism is found in all countries except Lithuania and is especially high in Spain, Austria, Germany, the United Kingdom, the Czech Republic and Poland. However, when interpreting this result one should keep in mind that this is a self-reported evaluation and, more importantly, a language advantage might pre-exist the study period abroad. While the Oster (2016) method indicates that the bounding set excludes zero and the delta is higher than the heuristic threshold, many of the bounding sets are not within the confidence interval of the controlled estimates. This result suggests that the magnitudes of the estimates controlling for the selection on observables may be too high and may not be supported if selection on unobservables were taken into account.

Another mechanism may be the continuation of studies after university graduation, which we can observe in the data. In fact, student mobility increases the

[20] The results at the country level and using the Oster (2016) method as applied to the mechanisms underlying the effects of student mobility can be obtained from the author upon request. In general, the student mobility coefficients are robust to omitted variable bias, with the exception of language ability.

probability of pursuing further studies by 5 p.p. (0.045***[0.010]). At the country level, we observe that this result is the case in Belgium, Finland, the Netherlands, and Norway and is especially high in the Czech Republic (14 p.p.) and Germany (12 p.p.). Conversely, in Hungary and Slovenia, student mobility has a negative effect on further studies. The continuation of studies may partly explain the delayed effect of labor market entry and the increase in hourly earnings.

Finally, we also consider mechanisms related to the characteristics of the job held at the time of the survey that may potentially lead to higher hourly earnings. First, we consider the probability of working in the private sector and find a positive and significant effect of 4 p.p. at the pooled level (0.039***[0.009]). This result is also significant for France (12.8 p.p.), Finland (5 p.p.), Belgium (6.5 p.p.) and Poland (11 p.p.). However, in Slovenia, the coefficient is negative and significant (-8.1 p.p.). Second, we also find a 10 p.p. (0.104***[0.010]) effect on the probability of working in a firm with international operations. This result occurs in the majority of the countries, with effects as high as 20 p.p. in Italy and Portugal. On the one hand, this very high and widespread effect of student mobility on the probability of working in a firm with international operations suggests that mobility may indeed help students develop relevant skills related to intercultural understanding. On the other hand, the results may simply indicate a personal preference for international experiences. The fact that the results are robust to omitted variable bias is more supportive of the former idea.

6. Sensitivity Analyses

In this section, we re-run the estimations using different specifications to assess whether the results presented previously are robust. We start by considering different samples than the one used originally (Table B.1). Second, university dummies are controlled for (Table B.2).

Sample issues

We start by assessing the extent to which the decisions made to limit the sample drive our results. As explained in Section 3, we concentrate on individuals who started their higher education degree between 17 and 30 years old. While the lower limit is reasonable, the upper limit was chosen ad hoc. Therefore, here we present two additional specifications where the upper bounds are instead set to 25 and 40 years of age. No differences are observed between the first column and columns 5 and 6 in Table B.1.

Another relevant aspect of the sample is the fact that it includes graduates who potentially moved to the country of graduation to study – degree mobility – who had their first working experience abroad (3%) and who were working abroad at the time of

the survey (2.7%). These special groups of individuals may partially drive the results if they have systematically different earnings from their counterparts. Three different robustness tests are conducted to account for this possibility[21]. In general, the results hold.

University characteristics

In the estimates presented above, we controlled for differences in the university systems across countries, captured by country dummies, but the universities within each country are also heterogeneous. University characteristics are likely to be correlated both with the decision to study abroad and with graduates' future labor market outcomes, but this relation can be thought to have both signs: on the one hand, students from worse universities may decide to study abroad to escape the bad quality and compensate for it; on the other hand, students attending high-quality universities may have more exchange programs available to them and more information at their disposal. Therefore, including university dummies as explanatory variables may increase or decrease the effect of mobility on outcomes.

An identifier of the university of graduation is only available for the countries surveyed by Reflex, i.e., 12 of the 16 countries analyzed in this paper. To assess how controlling for university dummies affects the findings presented thus far, the university dummies are introduced into the analysis and the results compared with the case without these dummies; these results can be found in Table B.2[22] and are not dramatically different. The estimates for the time to find the first job change slightly and are no longer significant for the two countries in which the estimates were only marginally significant – the Netherlands and France. For the probability of being employed and hourly earnings five years after graduation, the results hardly change.

7. Conclusion

The international mobility of students during higher education is an increasingly widespread phenomenon; however, few papers analyze its effects, and those that do so in a causal setting are limited to two countries and two outcomes. This paper adds to this stream of literature in several different ways. First, it conducts the analysis from a multinational perspective using a European survey on higher education graduates five years after graduation that is administered in 16 countries. Second, using these rich individual data, we study how student mobility during higher education affects several labor-market-related outcomes, namely, the transition from education to employment,

[21] See the appendix for further details.

[22] This analysis includes only 11 countries, those from the Reflex data except Portugal who have an average number of students per university of only 3.5.

employment probability and hourly earnings five years after graduation. Third, this analysis is carried out at the pooled level and also at the country level to analyze cross-country heterogeneous effects. Fourth, we also assess the heterogeneity of effects by gender, parental education and the duration of student mobility. Finally, in addition to the results from multivariate regression estimations that may suffer from unobserved heterogeneity, we present the results using a novel method that aims at assessing the estimates' robustness to omitted variable bias.

The main findings from the pooled sample show that student mobility is associated with a slightly longer time required to find the first job after graduation, particularly for those who are abroad for more than six months. Whereas student mobility does not affect employment probability five years after graduation, it is associated with higher hourly earnings (4%). However, this result is not robust to omitted variables bias. The country-level analysis reveals substantial heterogeneity in the effects on labor market outcomes, as the significant effects are limited to very few countries. These results have clear policy implications, suggesting that there is no one-size-fits-all policy, and the political discourse proclaiming the labor market benefits of mobility should be treated with caution. We provide a few reasons for the cross-country heterogeneity concerning the effect on hourly earnings, but further in-depth analyses should be addressed by future research.

The findings on the duration of mobility and the role of parental education inform policy makers regarding the design of international mobility programs. For instance, the barriers preventing students from less advantageous backgrounds from studying abroad should be tackled because this group seems to particularly benefit from study periods abroad. In addition, it may be important to consider that the delay in the transition to the labor market is only observed for stays longer than 6 months, but stays of this length are also significantly associated with an increase in earnings.

This paper is limited in several ways, mainly due to the lack of in-depth information about student mobility in the data. These limitations should be addressed by future research that makes use of richer data on student mobility. For instance, it would be pertinent to explore the effects by country of destination and by type of mobility (language course, Erasmus, summer school, etc.). It could also be relevant to analyze other outcomes, such as soft skills. Finally, whether the revealed effects fade out or are reinforced over time is still completely unknown, so a long-term analysis would be valuable.

Finally, it is important to obtain more thorough and recent data on mobility. The data used in this paper concern graduates from the early 2000s. Since then, several important changes have occurred in European higher education systems, the most important being the Bologna process and the creation of the European Higher Education Area, which were introduced with the aim of increasing student mobility between member states and worldwide. Furthermore, the phenomenon of short-term

mobility during higher education has become more prominent over the last decade. The number of students studying abroad under the Erasmus program grew by an annual average rate of 5.5% between 2000 and 2010. Further research should assess whether the effects increase, are maintained or fade out as studying abroad becomes a more common phenomenon in recent graduate cohorts.

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TABLES

Table 1 – Descriptive statistics by country

	Observations	% of Total	Mobile (share)	Time to find 1st job	Employed 5 years	Hourly earnings 5 years (log)
Italy	2318	8.0	0.16	10.3	0.87	2.22
				(13.0)	(0.33)	(0.45)
Spain	3202	11.1	0.13	11.4	0.87	2.26
				(12.8)	(0.33)	(0.45)
France	1266	4.4	0.32	10.8	0.89	2.56
				(13.8)	(0.32)	(0.41)
Austria	1232	4.3	0.31	6.7	0.88	2.60
				(8.9)	(0.33)	(0.37)
Germany	1276	4.4	0.31	6.4	0.92	2.83
				(9.6)	(0.28)	(0.41)
Netherlands	2658	9.2	0.28	5.6	0.94	2.64
				(10.2)	(0.25)	(0.28)
United Kingdom	1112	3.9	0.17	7.6	0.91	2.61
				(10.3)	(0.29)	(0.44)
Finland	2071	7.2	0.25	6.2	0.87	2.58
				(9.4)	(0.34)	(0.34)
Norway	1652	5.7	0.18	4.9	0.95	2.76
				(8.6)	(0.21)	(0.32)
Czech Republic	5938	20.6	0.13	9.0	0.89	2.05
				(10.9)	(0.31)	(0.44)
Portugal	486	1.7	0.11	7.5	0.91	2.38
				(9.9)	(0.29)	(0.50)
Belgium	1146	4.0	0.24	8.3	0.96	2.71
				(9.9)	(0.20)	(0.33)
Slovenia	2122	7.4	0.10	7.3	0.94	2.45
				(9.2)	(0.24)	(0.46)
Lithuania	476	1.7	0.09	6.7	0.91	1.78
				(8.8)	(0.28)	(0.76)
Poland	1075	3.7	0.17	3.3	0.96	2.10
				(3.1)	(0.21)	(0.53)
Hungary	836	2.9	0.13	7.9	0.87	1.74
				(10.8)	(0.34)	(1.07)
Pooled	28866	100	0.19	7.6	0.91	2.42
				(10.5)	(0.29)	(0.57)

Note: Reflex and Hegesco data, own computations. Reflex surveys graduates from 1999/2000 and Hegesco surveys graduates from 2002/2003. The last three columns report the mean values of the outcome variables, with standard deviations in parentheses.

Table 2- Differences in means for outcomes and covariates between mobile and non-mobile graduates, pooled and country level

		Pooled	Italy	Spain	France	Austria	Germany	Netherlands	UK	Finland
Outcomes	Time to find 1st job	0.61***	-0.77	-0.35	0.14	-0.09	1.08	1.32**	0.70	-0.53
	Employment 5 years	0.00	0.01	0.00	0.00	0.03	-0.02	0.00	-0.04	0.00
	Hourly earnings 5 years	0.16***	0.11***	0.13***	0.16***	-0.02	0.05	0.00	-0.01	0.03
Demographics	Male	-0.01	-0.07**	-0.03	0.10***	-0.04	0.01	-0.02	-0.05	-0.13***
	Age	-0.12***	-0.12	-0.23**	-0.20	-0.34**	-0.55***	-0.26***	0.33	-0.60***
	Parental educ. high	0.16***	0.14***	0.22***	0.16***	0.14***	0.09***	0.09***	0.11***	0.10***
Mobility	Migrant	0.02***	0.00	0.02*	-0.01	0.04**	0.02	0.02*	0.21***	0.01*
Capital	Parents immigrants	0.03***	0.03***	0.03***	-0.03	0.05**	0.02	-0.01	0.22***	0.00
	Lived abroad at 16	0.02***	0.01	0.02**	0.00	0.03**	0.01	0.01	0.19***	0.00
Secondary	Mainstream	0.05***	0.11***	0.04***	0.09***	0.08***	0.11***	0.08***	-0.05	0.08***
Degree	Final grade	(1)	0.167**	0.290***	0.226**	0.125**	-0.554***	0.045	-0.149	0.441***
Higher	Access PhD	0.13***	0.06***	0.27***	0.23***	0.04***	0.12***	0.16***	0.08***	0.13***
Education	Internship HE	0.04***	0.03	-0.06**	0.05**	0.00	0.06**	0.00	0.12***	-0.12***
	Work experience	0.11***	0.12***	0.03	0.06*	0.08**	0.06**	0.01	0.15***	0.07***
	Volunteer	0.16***	0.07***	0.05***	0.17***	0.09***	0.13***	0.17***	0.15***	0.16***
	Part-time studies	-0.03***	0.03	-0.01	0.00	-0.04	-0.08***	-0.05***	-0.04***	0.00

(1) The grade obtained in the secondary degree is measured at the country level on different scales.

Note: Reflex and Hegesco data, own computations. Reflex surveys graduates from 1999/2000 and Hegesco surveys graduates from 2002/2003. The table shows the test of equality of means between the mobile and non-mobile groups of graduates. The table with the means by groups and with the standard errors is available from the author upon request. * p<0.1; ** p<0.05; *** p<0.01.

(continued)

		Pooled	Norway	Czech Rep.	Portugal	Belgium-Fl.	Slovenia	Lithuania	Poland	Hungary
Outcomes	Time to find 1st job	0.61***	1.05*	2.02***	-0.46	3.83***	0.90	-2.61**	0.49	-0.19
	Employment 5 years	0.00	0.01	0.01	0.05	-0.01	-0.03*	-0.05	0.00	0.06**
	Hourly earnings 5 years	0.16***	0.06***	0.08***	0.07	-0.02	0.05	0.03	0.21***	0.08
Demographics	Male	-0.01	0.00	-0.06***	0.11	-0.07**	-0.04	-0.07	-0.03	0.05
	Age	-0.12***	-0.32**	-0.18**	-0.54**	0.05	-0.47**	0.54	-0.34***	-0.33*
	Parental educ. high	0.16***	0.21***	0.16***	0.16**	0.10***	0.20***	0.07	0.24***	0.19***
Mobility	Migrant	0.02***	0.03**	0.00	0.00	-0.01	0.00	-0.01	0.00	0.02
Capital	Parents immigrants	0.03***	0.05**	0.00	0.00	0.00	-0.02	-0.02	0.04*	0.07**
	Lived abroad at 16	0.02***	0.02**	0.01**	0.03	0.00	0.00	-0.01*	0.03	0.01
Secondary	Mainstream	0.05***	0.02	0.15***	0.03	0.04**	0.00*	-0.01	-0.09***	0.01
Degree	Final grade	(1)	0.69***	-0.54***	0.21	0.17	0.22***	-0.32**	0.36***	0.09
Higher	Access PhD	0.13***	0.21***	0.02	0.07	0.05*	0.06***	0.17**	-0.02	0.23***
Education	Internship HE	0.04***	-0.25***	0.22***	0.01	0.00	-0.05	0.09	0.07*	-0.02
	Work experience	0.11***	-0.01	0.10***	0.05	0.00	0.11***	0.04	0.13***	0.08
	Volunteer HE	0.16***	0.25***	0.06***	0.21***	0.11***	0.14***	0.10	0.15***	0.19***
	Part-time studies	-0.03	-0.02	0.01	-0.06	-0.01	-0.11	-0.03	-0.09	-0.02

(2) The grade obtained in the secondary degree is measured at the country level on different scales.

Note: Reflex and Hegesco data, own computations. Reflex surveys graduates from 1999/2000 and Hegesco surveys graduates from 2002/2003. The table shows the test of equality of means between the mobile and non-mobile groups of graduates. The table with the means by groups and with the standard errors is available from the author upon request. * p<0.1; ** p<0.05; *** p<0.01.

Table 3 – Effects of student international mobility on time to find first job after graduation: Main results from multivariate analysis and Oster (2016) method

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\dot{\beta}$	$\dot{R}$	$\tilde{\beta}$	$\tilde{R}$	Bounding set $[\tilde{\beta}, \beta^*(\min\{2\tilde{R}, 1\}; 1)]$	Excludes zero?	Within conf. interval?	Delta for β=0
Pooled EU	0.867***	0.052	0.665***	0.094	[0.113,0.665]	Yes	Yes	1.2
Italy	-1.017	0.030	-1.161	0.084	[-1.334,-1,161]	Yes	Yes	-3.0
Spain	-0.082	0.011	-0.073	0.074	[-0.073,-0.062]	Yes	Yes	9.1
France	0.411	0.058	1.696*	0.313	[1.696,2.783]	Yes	Yes	-1.0
Austria	-0.027	0.012	0.126	0.062	[0.126,0.307]	Yes	Yes	-0.7
Germany	1.028	0.016	0.705	0.092	[0.453,0.705]	Yes	Yes	4.8
Netherlands	1.506***	0.018	1.102*	0.092	[0.631,1.102]	Yes	Yes	2.4
UK	0.972	0.055	0.942	0.172	[0.917,0.942]	Yes	Yes	-3.3
Finland	-0.649	0.061	-0.622	0.132	[-0.622,-0.589]	Yes	Yes	-4.5
Norway	1.164*	0.009	0.642	0.119	[0.219,0.642]	Yes	Yes	1.6
Czech Rep.	2.109***	0.024	2.667***	0.147	[2.667,3.252]	Yes	Yes	-3.0
Portugal	0.270	0.102	0.583	0.307	[0.583,1.003]	Yes	Yes	-1.2
Belgium	3.749***	0.071	3.094***	0.149	[2.448,3.094]	Yes	Yes	-6.1
Slovenia	1.302	0.033	1.739*	0.100	[1.739,2.335]	Yes	Yes	-2.3
Lithuania	-2.612*	0.018	-3.050*	0.253	[-3.379,-3.050]	Yes	Yes	-2.9
Poland	0.621*	0.405	0.807**	0.445	[0.807,1.170]	Yes	Yes	-0.2
Hungary	-0.736	0.034	-0.439	0.110	[-0.439,-0.251]	Yes	Yes	7.0

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. Columns (1) and (2) present OLS results controlling only for student mobility and contextualizing variables. The controlled estimates in columns (3) and (4) are from OLS regressions controlling for all of the observed variables discussed in Section 3 (contextualizing, demographic, mobility capital, secondary degree and high education variables). The results in columns (5) to (8) are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.

Table 4 – Effects of student international mobility on the probability of being employed five years after graduation: Main results from multivariate analysis and Oster (2016) method

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\dot{\beta}$	$\dot{R}$	$\tilde{\beta}$	$\tilde{R}$	Bounding set $[\tilde{\beta}, \beta^*(\min\{2\tilde{R}, 1\}; 1)]$	Excludes zero?	Within conf. interval?	Delta for β=0
Pooled EU	0.001	0.015	0.006	0.038	[0.006,0.015]	Yes	Yes	-0.7
Italy	0.010	0.006	0.019	0.048	[0.019,0.027]	Yes	Yes	-1.6
Spain	0.002	0.013	0.009	0.050	[0.009,0.018]	Yes	Yes	-0.9
France	-0.009	0.028	-0.005	0.143	[-0.005,-0.001]	Yes	Yes	1.4
Austria	0.033	0.012	0.046**	0.091	[0.046,0.060]	Yes	Yes	-2.7
Germany	-0.013	0.011	-0.024	0.066	[-0.032,-0.024]	Yes	Yes	-1.4
Netherlands	0.001	0.005	0.001	0.039	[0.001,0.002]	Yes	Yes	-1.7
UK	-0.051*	0.021	-0.020	0.077	[-0.020,0.005]	No	Yes	0.8
Finland	-0.010	0.012	0.004	0.076	[0.004,0.015]	Yes	Yes	-0.3
Norway	0.009	0.019	0.019	0.057	[0.019,0.031]	Yes	Yes	-1.1
Czech Rep.	0.014	0.005	0.019	0.066	[0.019,0.024]	Yes	Yes	-2.9
Portugal	0.053	0.016	0.069*	0.148	[0.069,0.085]	Yes	Yes	-3.1
Belgium	-0.015	0.014	-0.007	0.053	[-0.007,-0.002]	Yes	Yes	1.4
Slovenia	-0.033*	0.008	-0.030	0.053	[-0.030,-0.026]	Yes	Yes	11.8
Lithuania	-0.058	0.055	-0.059	0.247	[-0.060,-0.059]	Yes	Yes	-4.0
Poland	-0.005	0.011	-0.007	0.061	[-0.009,-0.007]	Yes	Yes	-1.6
Hungary	0.052	0.014	0.052	0.079	[0.052,0.052]	Yes	Yes	-2.1

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. Columns (1) and (2) present OLS results controlling only for student mobility and contextualizing variables. The controlled estimates in columns (3) and (4) are from OLS regressions controlling for all of the observed variables discussed in Section 3 (contextualizing, demographic, mobility capital, secondary degree and high education variables). The results in columns (5) to (8) are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.

Table 5 – Effects of student international mobility on hourly earnings five years after graduation: Main results from multivariate analysis and Oster (2016) method

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\dot{\beta}$	$\dot{R}$	$\tilde{\beta}$	$\tilde{R}$	Bounding set $[\tilde{\beta}, \beta^*(\min\{2\tilde{R}, 1\}; 1)]$	Excludes zero?	Within conf. interval?	Delta for β=0
Pooled EU	0.051***	0.296	0.040***	0.334	[-0.174,0.040]	No	No	0.3
Italy	0.115***	0.018	0.118***	0.084	[0.118,0.121]	Yes	Yes	-5.7
Spain	0.134***	0.022	0.082***	0.123	[0.024,0.082]	Yes	Yes	1.4
France	0.160***	0.059	0.053	0.242	[-0.040,0.053]	No	No	0.5
Austria	-0.026	0.041	-0.014	0.150	[-0.014,0.001]	No	Yes	0.9
Germany	0.051	0.031	0.040	0.123	[0.030,0.040]	Yes	Yes	26.0
Netherlands	-0.019	0.063	-0.031**	0.196	[-0.048,-0.031]	Yes	Yes	-1.7
UK	-0.026	0.022	-0.013	0.150	[-0.013,-0.004]	Yes	Yes	1.5
Finland	-0.006	0.124	0.027	0.295	[0.027,0.065]	Yes	Yes	-0.5
Norway	0.035	0.085	0.014	0.211	[-0.010,0.014]	No	Yes	0.5
Czech Rep.	0.080***	0.020	0.097***	0.099	[0.097,0.117]	Yes	Yes	-3.2
Portugal	0.068	0.108	-0.013	0.287	[-0.124,-0.013]	Yes	Yes	-0.1
Belgium	-0.021	0.023	-0.019	0.069	[-0.019,-0.017]	Yes	Yes	-4.7
Slovenia	0.043	0.019	0.007	0.086	[-0.034,0.007]	No	Yes	0.2
Lithuania	0.028	0.013	0.091	0.145	[0.091,0.137]	Yes	Yes	-1.1
Poland	0.213***	0.066	0.176***	0.213	[0.148,0.176]	Yes	Yes	-5.0
Hungary	0.058	0.014	0.020	0.075	[-0.001,0.020]	No	Yes	0.9

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. Columns (1) and (2) present OLS results controlling only for student mobility and contextualizing variables. The controlled estimates in columns (3) and (4) are from OLS regressions controlling for all of the observed variables discussed in Section 3 (contextualizing, demographic, mobility capital, secondary degree and high education variables). The results in columns (5) to (8) are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.

Table 6 – Correlations between estimated effects and reasons for cross-country heterogeneity

	University ranking	Student mobility (%)	Employers strongly disagree (%)
Time to find 1st job	0.125	0.284	0.228
[p-value]	[0.656]	[0.287]	[0.396]
Employment 5 years	-0.258	0.001	-0.269
[p-value]	[0.353]	[0.995]	[0.312]
Hourly earnings 5 years	-0.541**	-0.312	-0.309
[p-value]	[0.037]	[0.239]	[0.244]

Note: Reflex and Hegesco data, own computations. The table presents the correlations between the estimated effects at the country level with different country-level indicators: the university ranking according to Universitas 21 (2012) (column 1); the share of graduates who were mobile during their higher education according to what is reported in Table 1 (column 2); and the percentage of employers who strongly disagree that student mobility is an important factor when recruiting according to what was reported by the European Commission (2010) (column 3). See text for details. *p<0.1, **p<0.05,***p<0.01.

Appendix

Appendix A – Heterogeneous effects

In this section, we explore potential effect heterogeneity. The above results present average effects for different groups of individuals, but relevant differences may arise when these groups are disaggregated. We explore the heterogeneous effects by gender, socio-economic background, and duration of the international experience. The results are presented in the appendix in Tables A.1, A.2 and A.3, respectively.

Gender

Student mobility can bring about different effects for males and females for different reasons. For instance, one of the groups may be more selective of the destination country or university. Another reason may be related to the perceptions of employers: if more are inclined to think that one gender is more likely to negatively select into mobility, then the effects may concentrate on this group.

In general, we find that the effect of student mobility on the time to find the first job after graduation is indeed higher for males than for females. At the pooled level, in the Netherlands and Poland, the effect is only significant for males, while in the Czech Republic and Belgium, both genders reveal significant coefficients, but they are higher for males. Positive effects of student mobility on employability five years after graduation are only found for females in Austria (7.4 p.p.) and the Czech Republic (4 p.p.). In general, the effects are higher for females. Conversely, in Hungary, a significant and positive effect arises only for males (8 p.p.). The pattern is quite diverse regarding the heterogeneity of effects in hourly earnings. A positive effect is found in both genders for some countries (pooled Europe, Italy, the Czech Republic and Poland). In some others, the positive effect is concentrated in males (Spain 3 p.p., Germany 11 p.p.,), while in others, it is concentrated in females (France 8 p.p.). In the Netherlands and Belgium, significant effects arise only in females and are negative, which is similar to the previous results (Table 3).

Socio-economic background (SES)

The graduates are divided in two groups based on their parents' education and are considered to have a high (low) socio-economic background if at least one parent (none) holds a university degree. It is interesting to explore this source of heterogeneity because student mobility may be a mechanism to perpetuate or decrease social inequality.

We find that the longer time to find the first job associated with student mobility is mainly driven by the group having an advantaged background. In Italy, the effect of student mobility is negative for low SES, which supports the overall result.

The opposite occurs only in Poland, with a positive effect for low SES. Additionally, regarding the probability of being employed, the effect of student mobility is negative for high SES and positive for low SES (the exception is Belgium). However, as in the previous results, the effects are significant in very few countries. As for hourly earnings, the pattern is again diverse, but the tendency is that the positive effects are concentrated in the low SES group. In some countries, both SES groups are positively affected (pooled Europe, Italy and the Czech Republic). In other countries, a positive effect is found only for a low SES (Spain and Poland), while in Belgium, a negative (positive) effect is found for a high SES (low SES). In the Netherlands, where the main effect was negative, we conclude that the result was mainly driven by the low-SES group.

Duration of mobility

For this exercise, we distinguish between shorter international stays (less than or equal to 6 months) and longer stays (more than 6 months). We find that the longer search time resulting from studying abroad is mainly associated with longer stays abroad. The significant effects also tend to be concentrated in this group, and in the Czech Republic and Belgium, where the effects are significant in both groups, they are clearly higher for longer stays. The opposite occurs in Italy, however, where longer stays lead to a lower search time. The significant and positive effects of student mobility on the probability of being employed 5 years after graduation previously found in Austria and Portugal are mainly driven by short stays abroad. We also find a positive (negative) effect for long stays abroad in Lithuania and Hungary (Slovenia). In the UK, we find a negative effect for short stays and a positive effect for long stays. With regard to hourly earnings, the pattern is again mixed. At the pooled level, we observe that both mobility durations lead to an increase in earnings, with a slight advantage for long stays. However, similar to the previous results, these coefficients cannot be considered robust to omitted variable bias. At the country level, positive and significant effects are found for both groups in Italy, Spain, the Czech Republic and Poland. In all of these countries, the effect is substantially stronger for those who stayed abroad longer. In Finland and France, a significant effect is found, but only for the long-stay group. In the Netherlands, where the main effect was negative, we conclude that the effect is restricted to the long-stay group (-9.5%).

Table A.1- Heterogeneous effects by gender

	Males					Females				
	$\tilde{\beta}$	Bounding set	Excludes zero?	Within CI?	Delta for β=0	$\tilde{\beta}$	Bounding set	Excludes zero?	Within CI?	Delta for β=0
Time to find 1st job										
Italy	-0.432	[-0.648,-0.432]	Yes	Yes	-1.4	-1.715	[-1.715,-1.595]	Yes	Yes	-4.5
Spain	2.267	[2.267,3.523]	Yes	Yes	-1.3	-1.108	[-1.389,-1.108]	Yes	Yes	-2.6
France	2.761	[2.761,3.712]	Yes	Yes	-0.8	1.041	[1.041,1.401]	Yes	Yes	-1.1
Austria	0.853	[0.853,0.952]	Yes	Yes	-1.9	-0.122	[-0.122,-0.033]	Yes	Yes	1.9
Germany	-0.664	[-1.368,-0.664]	Yes	Yes	-0.7	1.309	[1.008,1.309]	Yes	Yes	-13.2
Netherlands	2.220**	[2.220,2.224]	Yes	Yes	-4.2	0.286	[-0.255,0.285]	No	Yes	0.5
UK	1.477	[1.477,1.686]	Yes	Yes	-1.0	0.539	[0.343,0.539]	Yes	Yes	-13.1
Finland	0.685	[0.685,1.157]	Yes	Yes	-0.5	-1.058	[-1.058,-0.700]	Yes	Yes	6.7
Norway	1.564	[1.564,1.888]	Yes	Yes	-1.5	0.842	[0.481,0.842]	Yes	Yes	3.7
Czech Rep.	3.354***	[3.354,3.996]	Yes	Yes	-1.9	2.027**	[1.705,2.027]	Yes	Yes	7.0
Portugal	-1.949	[-3.127,-1.949]	Yes	Yes	-1.0	1.351	[1.351,2.021]	Yes	Yes	-1.3
Belgium	3.990***	[3.990,4.006]	Yes	Yes	-1.0	2.645**	[2.037,2.645]	Yes	Yes	-3.2
Slovenia	1.763	[1.444,1.763]	Yes	Yes	11.1	1.110	[1.110,1.238]	Yes	Yes	-6.3
Lithuania	-1.424	[-1.424,-1.221]	Yes	Yes	17.5	-2.500	[-3.143,-2.500]	Yes	Yes	-1.4
Poland	1.518**	[1.518,1.639]	Yes	Yes	-2.2	0.191	[0.191,0.202]	Yes	Yes	-0.4
Hungary	-2.958	[-3.287,-2.958]	Yes	Yes	-1.0	0.347	[0.347,0.569]	Yes	Yes	-0.7
Pooled EU	1.128***	[1.128,1.421]	Yes	Yes	-6.7	0.417	[-0.600,0.417]	No	No	0.4
Employment 5 years										
Italy	-0.004	[-0.008,-0.004]	Yes	Yes	-0.7	0.032	[0.032,0.038]	Yes	Yes	-1.9
Spain	0.002	[0.002,0.018]	Yes	Yes	-0.1	0.015	[0.015,0.016]	Yes	Yes	-3.4
France	0.040	[0.040,0.047]	Yes	Yes	-1.1	-0.027	[-0.032,-0.027]	Yes	Yes	-1.4
Austria	0.012	[0.012,0.014]	Yes	Yes	-1.4	0.074**	[0.074,0.078]	Yes	Yes	-0.7
Germany	-0.033	[-0.049,-0.033]	Yes	Yes	-1.1	-0.018	[-0.019,-0.018]	Yes	Yes	-2.1
Netherlands	0.015	[0.015,0.017]	Yes	Yes	-2.8	-0.008	[-0.011,-0.008]	Yes	Yes	-1.5
UK	-0.045	[-0.047,-0.045]	Yes	Yes	-1.4	0.000	[0.000,0.016]	No	Yes	0.0
Finland	0.000	[0.000,0.006]	Yes	Yes	0.0	0.005	[-0.005,0.005]	No	Yes	0.4
Norway	0.015	[0.015,0.018]	Yes	Yes	-1.5	0.024	[0.024,0.036]	Yes	Yes	-0.9
Czech Rep.	-0.015	[-0.015,-0.013]	Yes	Yes	-25.3	0.039**	[0.027,0.039]	Yes	Yes	3.5
Portugal	0.023	[-0.004,0.023]	No	Yes	0.8	0.106	[0.106,0.156]	Yes	Yes	-1.1
Belgium	0.012	[0.012,0.013]	Yes	Yes	-1.0	-0.022	[-0.022,-0.018]	Yes	Yes	-4.0
Slovenia	0.001	[0.001,0.014]	Yes	Yes	-0.1	-0.042	[-0.047,-0.042]	Yes	Yes	-5.4
Lithuania	0.031	[0.030,0.031]	Yes	Yes	-3.2	-0.110	[-0.128,-0.110]	Yes	Yes	-1.7
Poland	-0.024	[-0.024,-0.021]	Yes	Yes	-6.6	-0.001	[-0.005,-0.001]	Yes	Yes	-0.2
Hungary	0.078*	[0.078,0.079]	Yes	Yes	-1.4	0.037	[0.035,0.037]	Yes	Yes	-2.1
Pooled EU	0.006	[0.006,0.009]	Yes	Yes	-2.7	0.007	[0.007,0.015]	Yes	Yes	-1.2
Hourly earnings 5 years										
Italy	0.152**	[0.136,0.152]	Yes	Yes	206.3	0.088**	[0.083,0.088]	Yes	Yes	-6.0
Spain	0.131**	[0.089,0.131]	Yes	Yes	3.7	0.053	[-0.020,0.053]	No	Yes	0.7
France	0.038	[0.025,0.038]	Yes	Yes	-8.5	0.084**	[0.032,0.084]	Yes	Yes	2.3
Austria	-0.042	[-0.042,-0.041]	Yes	Yes	-2.7	-0.006	[-0.008,-0.006]	Yes	Yes	-0.6
Germany	0.115***	[0.115,0.120]	Yes	Yes	-3.7	-0.040	[-0.062,-0.040]	Yes	Yes	-0.7
Netherlands	-0.031	[-0.040,-0.031]	Yes	Yes	-1.5	-0.031*	[-0.041,-0.031]	Yes	Yes	-1.3
UK	-0.122*	[-0.122,-0.117]	Yes	Yes	-1.8	0.056	[0.056,0.061]	Yes	Yes	-1.1
Finland	0.011	[0.011,0.018]	Yes	Yes	-0.7	0.027	[0.026,0.027]	Yes	Yes	-2.9
Norway	-0.012	[-0.040,-0.012]	Yes	Yes	-0.3	0.023	[0.000,0.023]	Yes	Yes	1.0
Czech Rep.	0.085**	[0.085,0.111]	Yes	Yes	-1.6	0.104***	[0.099,0.104]	Yes	Yes	27.7
Portugal	0.035	[-0.081,0.035]	No	Yes	0.2	-0.027	[-0.027,-0.006]	Yes	Yes	1.4
Belgium	0.032	[0.029,0.032]	Yes	Yes	-2.3	-0.056*	[-0.065,-0.056]	Yes	Yes	-1.0
Slovenia	-0.052	[-0.052,-0.043]	Yes	Yes	10.9	0.055	[-0.007,0.055]	No	Yes	0.9
Lithuania	0.536	[0.536,0.582]	Yes	Yes	-0.1	-0.040	[-0.040,0.002]	No	Yes	0.9
Poland	0.203*	[0.203,0.236]	Yes	Yes	-1.6	0.184**	[0.150,0.184]	Yes	Yes	-1.9
Hungary	-0.043	[-0.071,-0.043]	Yes	Yes	-0.6	0.047	[0.022,0.047]	Yes	Yes	3.2
Pooled EU	0.042***	[-0.054,0.042]	No	No	0.6	0.034***	[-0.446,0.034]	No	No	0.1

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. The first column in each panel presents the controlled estimate, and the following four columns are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.

Table A.2 – Heterogeneous effects by parental education

	High-educated parents					Low-educated parents				
	$\tilde{\beta}$	Bounding set	Excludes zero?	Within CI?	Delta for β=0	$\tilde{\beta}$	Bounding set	Excludes zero?	Within CI?	Delta for β=0
Time to find 1st job										
Italy	1.710	[1.710,1.809]	Yes	Yes	-2.2	-2.685***	[-3.009,-2.685]	Yes	Yes	-2.3
Spain	0.965	[0.965,1.820]	Yes	Yes	-0.6	-0.504	[-0.752,-0.504]	Yes	Yes	-1.9
France	2.563*	[2.563,4.205]	Yes	Yes	-0.6	1.338	[1.338,1.386]	Yes	Yes	-2.4
Austria	0.830	[0.830,1.024]	Yes	Yes	-0.9	-0.408	[-0.550,-0.408]	Yes	Yes	-1.0
Germany	1.477	[1.477,1.596]	Yes	Yes	-2.0	-0.550	[-0.939,-0.550]	Yes	Yes	-0.5
Netherlands	2.144***	[1.976,2.144]	Yes	Yes	-15.4	0.307	[-0.007,0.307]	No	Yes	1.0
UK	0.417	[0.417,0.499]	Yes	Yes	-1.5	1.325	[1.325,1.548]	Yes	Yes	-1.5
Finland	0.151	[0.151,0.734]	Yes	Yes	-0.2	-0.722	[-0.980,-0.722]	Yes	Yes	-1.3
Norway	1.044	[1.044,1.051]	Yes	Yes	-4.2	-0.205	[-1.032,-0.205]	Yes	Yes	-0.2
Czech Rep.	3.785***	[3.785,4.023]	Yes	Yes	-1.6	1.235	[1.235,1.782]	Yes	Yes	-2.1
Portugal	1.394	[0.839,1.394]	Yes	Yes	15.4	-0.179	[-0.179,0.840]	No	Yes	0.2
Belgium	3.649***	[3.068,3.649]	Yes	Yes	-2.0	1.234	[1.234,1.409]	Yes	Yes	-2.5
Slovenia	0.703	[0.655,0.703]	Yes	Yes	-15.5	2.993	[2.993,3.110]	Yes	Yes	-8.3
Lithuania	-3.247	[-3.991,-3.247]	Yes	Yes	-1.4	0.571	[0.571,0.700]	Yes	Yes	-3.7
Poland	0.419	[0.419,0.628]	Yes	Yes	-0.5	1.478**	[1.432,1.478]	Yes	Yes	-0.3
Hungary	-0.454	[-0.454,-0.307]	Yes	Yes	-62.4	-1.334	[-1.680,-1.334]	Yes	Yes	-1.0
Pooled EU	1.256***	[1.256,1.589]	Yes	Yes	-6.0	0.015	[-0.767,0.015]	No	Yes	0.0
Employment 5 years										
Italy	0.027	[0.027,0.031]	Yes	Yes	-1.8	0.020	[0.020,0.029]	Yes	Yes	-1.5
Spain	-0.005	[-0.006,-0.005]	Yes	Yes	-2.0	0.025	[0.025,0.044]	Yes	Yes	-1.2
France	0.036	[0.036,0.041]	Yes	Yes	-1.4	-0.052	[-0.052,-0.032]	Yes	Yes	10.4
Austria	0.014	[0.014,0.016]	Yes	Yes	-1.0	0.063**	[0.063,0.068]	Yes	Yes	-1.7
Germany	-0.041*	[-0.054,-0.041]	Yes	Yes	-1.2	0.026	[0.026,0.029]	Yes	Yes	-1.1
Netherlands	0.008	[0.008,0.012]	Yes	Yes	-1.4	-0.011	[-0.012,-0.011]	Yes	Yes	-5.5
UK	-0.075*	[-0.075,-0.069]	Yes	Yes	-3.2	0.019	[0.019,0.033]	Yes	Yes	-0.8
Finland	-0.033	[-0.040,-0.033]	Yes	Yes	-1.2	0.014	[0.014,0.030]	Yes	Yes	-0.6
Norway	0.016	[0.016,0.026]	Yes	Yes	-0.9	0.039**	[0.039,0.053]	Yes	Yes	-1.8
Czech Rep.	0.023	[0.023,0.024]	Yes	Yes	-2.5	0.015	[0.015,0.024]	Yes	Yes	-1.4
Portugal	0.042	[0.024,0.042]	Yes	Yes	-24.5	0.058	[0.058,0.085]	Yes	Yes	-1.6
Belgium	0.004	[0.004,0.007]	Yes	Yes	-0.8	-0.052*	[-0.052,-0.046]	Yes	Yes	-13.4
Slovenia	-0.056*	[-0.056,-0.053]	Yes	Yes	-19.1	-0.006	[-0.006,-0.003]	Yes	Yes	1.9
Lithuania	-0.085	[-0.089,-0.085]	Yes	Yes	-2.2	0.016	[-0.020,0.016]	No	Yes	0.4
Poland	-0.015	[-0.015,-0.011]	Yes	Yes	-5.3	0.018	[0.015,0.018]	Yes	Yes	-1.9
Hungary	0.047	[0.047,0.050]	Yes	Yes	-1.5	0.050	[0.042,0.050]	Yes	Yes	-5.4
Pooled EU	-0.002	[-0.003,-0.002]	Yes	Yes	-3.6	0.014*	[0.014,0.028]	Yes	Yes	-1.1
Hourly earnings 5 years										
Italy	0.171**	[0.160,0.171]	Yes	Yes	-2.7	0.081*	[0.080,0.081]	Yes	Yes	-6.2
Spain	0.052	[0.042,0.052]	Yes	Yes	-14.9	0.117***	[0.068,0.117]	Yes	Yes	2.5
France	0.066	[0.000,0.066]	Yes	Yes	1.0	0.044	[-0.013,0.044]	No	Yes	0.7
Austria	-0.027	[-0.027,-0.015]	Yes	Yes	-7.0	0.014	[0.014,0.019]	Yes	Yes	-1.0
Germany	0.032	[0.006,0.032]	Yes	Yes	1.4	0.044	[0.044,0.062]	Yes	Yes	-0.8
Netherlands	-0.020	[-0.037,-0.020]	Yes	Yes	-0.8	-0.047**	[-0.053,-0.047]	Yes	Yes	-3.4
UK	0.078	[0.078,0.113]	Yes	Yes	-1.0	-0.103	[-0.117,-0.103]	Yes	Yes	-2.1
Finland	0.053*	[0.053,0.072]	Yes	Yes	-1.0	0.021	[0.021,0.071]	Yes	Yes	-0.3
Norway	0.019	[0.000,0.019]	No	Yes	1.0	0.026	[0.001,0.026]	Yes	Yes	1.0
Czech Rep.	0.095***	[0.095,0.107]	Yes	Yes	-1.6	0.096***	[0.096,0.125]	Yes	Yes	-2.8
Portugal	-0.069	[-0.119,-0.069]	Yes	Yes	-0.6	-0.053	[-0.189,-0.053]	Yes	Yes	-0.3
Belgium	-0.053*	[-0.054,-0.053]	Yes	Yes	-1.5	0.077*	[0.077,0.107]	Yes	Yes	-1.4
Slovenia	0.006	[0.001,0.006]	Yes	Yes	1.3	0.013	[-0.025,0.013]	No	Yes	0.3
Lithuania	0.122	[0.122,0.190]	Yes	Yes	-0.9	0.086	[0.050,0.086]	Yes	Yes	3.2
Poland	0.156	[0.156,0.164]	Yes	Yes	-0.9	0.193**	[0.180,0.193]	Yes	Yes	-1.2
Hungary	0.049	[0.023,0.049]	Yes	Yes	3.5	-0.110	[-0.164,-0.110]	Yes	Yes	-0.7
Pooled EU	0.035**	[-0.112,0.035]	No	No	0.3	0.041***	[0.007,0.041]	Yes	Yes	1.1

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. The first column in each panel presents the controlled estimate, and the following four columns are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.

Table A.3- Heterogeneous effects by duration of student international mobility

	Less than 6 months					More than 6 months				
	$\tilde{\beta}$	Bounding set	Excludes zero?	Within CI?	Delta for β=0	$\tilde{\beta}$	Bounding set	Excludes zero?	Within CI?	Delta for β=0
Time to find 1st job										
Italy	-0.638	[-0.847,-0.638]	Yes	Yes	-1.9	-3.279***	[-3.861,-3.279]	Yes	Yes	-4.0
Spain	-1.299	[-1.671,-1.299]	Yes	Yes	-3.3	0.499	[0.499,0.612]	Yes	Yes	-3.6
France	0.978	[0.978,3.095]	Yes	Yes	-0.3	3.621**	[3.251,3.621]	Yes	Yes	-6.3
Austria	-0.012	[-0.012,0.180]	No	Yes	0.0	0.698	[0.698,0.762]	Yes	Yes	-2.0
Germany	0.283	[0.101,0.283]	Yes	Yes	1.7	1.224	[0.985,1.224]	Yes	Yes	69.9
Netherlands	0.636	[0.328,0.636]	Yes	Yes	2.2	2.359**	[1.070,2.359]	Yes	Yes	1.8
UK	1.455	[1.455,2.658]	Yes	Yes	-0.8	0.112	[-2.253,0.112]	No	Yes	0.0
Finland	-0.647	[-0.853,-0.647]	Yes	Yes	-1.7	-0.895	[-0.895,-0.536]	Yes	Yes	3.6
Norway	0.064	[0.064,0.230]	Yes	Yes	-0.3	1.931	[0.702,1.931]	Yes	Yes	1.7
Czech Rep.	1.981***	[1.981,2.633]	Yes	Yes	-2.1	4.848***	[4.848,5.119]	Yes	Yes	-12.1
Portugal	1.334	[1.334,3.969]	Yes	Yes	-0.4	-0.817	[-4.564,-0.817]	Yes	Yes	-0.2
Belgium	2.368***	[1.849,2.368]	Yes	Yes	37.6	5.725***	[4.492,5.725]	Yes	Yes	-38.9
Slovenia	2.217*	[2.217,2.827]	Yes	Yes	-3.2	-0.177	[-0.177,0.222]	No	Yes	0.4
Lithuania	-2.984	[-3.423,-2.984]	Yes	Yes	-2.5	-4.010	[-4.010,-1.670]	Yes	Yes	1.7
Poland	0.628	[0.628,0.889]	Yes	Yes	-0.2	0.857	[0.857,1.080]	Yes	Yes	-0.5
Hungary	-1.148	[-1.148,-0.934]	Yes	Yes	-5.1	5.335	[5.334,7.173]	Yes	Yes	-1.3
Pooled EU	0.263	[0.263,0.449]	Yes	Yes	-1.9	1.520***	[-0.310,1.520]	No	No	0.8
Employment 5 years										
Italy	0.028	[0.028,0.037]	Yes	Yes	-2.1	0.009	[0.009,0.024]	1	1	-0.6
Spain	0.031	[0.031,0.038]	Yes	Yes	-4.1	-0.015	[-0.015,-0.006]	1	1	1.6
France	0.000	[-0.006,0.000]	No	Yes	0.0	0.000	[0.000,0.019]	1	1	0.0
Austria	0.047*	[0.047,0.055]	Yes	Yes	-2.1	0.050	[0.050,0.057]	1	1	-1.6
Germany	-0.021	[-0.030,-0.021]	Yes	Yes	-1.3	-0.020	[-0.026,-0.020]	1	1	-1.9
Netherlands	0.007	[0.007,0.007]	Yes	Yes	157.7	-0.022	[-0.022,-0.014]	1	1	3.0
UK	-0.106**	[-0.106,0.098]	Yes	Yes	-6.0	0.058*	[0.058,0.110]	1	1	-0.6
Finland	0.000	[0.000,0.018]	No	Yes	0.0	0.006	[0.000,0.006]	1	1	1.1
Norway	0.008	[0.008,0.022]	Yes	Yes	-0.5	0.028	[0.028,0.030]	1	1	-3.4
Czech Rep.	0.018	[0.018,0.023]	Yes	Yes	-2.7	0.022	[0.022,0.027]	1	1	-3.8
Portugal	0.122***	[0.122,0.141]	Yes	Yes	-2.9	-0.054	[-0.054,-0.019]	1	1	1.6
Belgium	-0.012	[-0.012,-0.004]	Yes	Yes	1.6	-0.004	[-0.004,0.002]	0	1	0.6
Slovenia	-0.015	[-0.016,-0.015]	Yes	Yes	-14.9	-0.098*	[-0.098,-0.083]	1	1	7.5
Lithuania	-0.074	[-0.075,-0.074]	Yes	Yes	-3.8	0.060*	[0.044,0.060]	1	1	4.1
Poland	-0.007	[-0.007,-0.007]	Yes	Yes	-3.0	-0.026	[-0.037,-0.026]	1	1	-1.4
Hungary	0.037	[0.033,0.037]	Yes	Yes	-4.3	0.096*	[0.096,0.107]	1	1	-4.2
Pooled EU	0.005	[0.005,0.010]	Yes	Yes	-1.0	0.007	[0.007,0.024]	1	1	-0.4
Hourly earnings 5 years										
Italy	0.093**	[0.093,0.095]	Yes	Yes	-6.7	0.172***	[0.172,0.186]	Yes	Yes	-8.0
Spain	0.082**	[0.058,0.082]	Yes	Yes	3.4	0.091**	[-0.007,0.091]	No	Yes	0.9
France	0.030	[-0.045,0.030]	No	Yes	0.4	0.111**	[0.012,0.111]	Yes	Yes	1.2
Austria	-0.030	[-0.030,-0.018]	Yes	Yes	4.0	0.002	[0.002,0.008]	Yes	Yes	-0.2
Germany	0.041	[0.033,0.041]	Yes	Yes	40.0	0.040	[0.035,0.040]	Yes	Yes	-11.1
Netherlands	-0.018	[-0.032,-0.018]	Yes	Yes	-1.1	-0.095***	[-0.120,-0.095]	Yes	Yes	-3.2
UK	0.022	[-0.046,0.022]	No	Yes	0.3	-0.034	[-0.034,0.048]	No	Yes	0.4
Finland	0.021	[0.021,0.080]	Yes	No	-0.3	0.056*	[0.056,0.062]	Yes	Yes	-3.1
Norway	0.036	[0.004,0.036]	Yes	Yes	1.1	-0.041	[-0.071,-0.041]	Yes	Yes	-0.9
Czech Rep.	0.083***	[0.083,0.102]	Yes	Yes	-2.8	0.144**	[0.144,0.163]	Yes	Yes	-6.1
Portugal	-0.036	[-0.134,-0.036]	Yes	Yes	-0.3	0.053	[-0.013,0.053]	No	Yes	0.8
Belgium	-0.002	[-0.002,0.002]	No	Yes	0.4	-0.054	[-0.054,-0.053]	Yes	Yes	-3.4
Slovenia	-0.008	[-0.064,-0.008]	Yes	Yes	-0.1	0.049	[0.028,0.049]	Yes	Yes	2.4
Lithuania	0.065	[0.065,0.106]	Yes	Yes	-1.0	0.253	[0.253,0.298]	Yes	Yes	-3.5
Poland	0.183**	[0.161,0.183]	Yes	Yes	-4.3	0.259**	[0.201,0.259]	Yes	Yes	14.8
Hungary	-0.001	[-0.013,-0.001]	Yes	Yes	-0.1	0.189	[0.113,0.189]	Yes	Yes	2.5
Pooled EU	0.037***	[-0.119,0.037]	No	No	0.3	0.049***	[-0.110,0.049]	No	No	0.4

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. The first column in each panel presents the controlled estimate, and the following four columns are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.

APPENDIX B – SENSITIVITY ANALYSIS

Table B.1 presents the estimation results for different samples. Column (1) reports the original estimates. In columns (5) and (6) different age ranges are considered. In columns (2) to (4) some part of the sample are left out.

First, graduates who started working in another country after graduation (3%) are dropped. These individuals could be driving the effect on the time required to find the first job or on hourly earnings if they took a different career path due to this decision. However, the overall results in column 2 do not indicate such a result. Second, we eliminate individuals who are potentially degree mobility graduates, i.e., individuals who earned their entire degree in a foreign country. These graduates could eventually also be (short-term) mobile if they spent part of their studies in another country then that issuing the degree. The only way to avoid capturing these graduates is to drop those born in a different country and those who lived abroad at 16 years old (3.1% of the sample). The results are shown in column 4; no relevant differences are revealed. Third, for the same reasons and as a final check, graduates working abroad at the time of the survey are dropped. The estimates hardly change (column 3). However, two exceptions should be noted. For Austria, the effect on employability is no longer significant, which means that in this country, student mobility particularly fosters chances for employment abroad. In Poland, the effect on hourly earnings decreases substantially and loses significance, which suggests that the increase in hourly earnings may be restricted to those who are not living in Poland at the time of the survey.

Table B.1 – Robustness exercise – sample issues

	Original $\tilde{\beta}$ (1)	1st employment not abroad (2)	Currently not living abroad (3)	No degree mobility (4)	Age [17,40] (5)	Age [17,25] (6)
Time to find 1st job						
Italy	-1.161	-1.175	-1.129	-1.232	-1.175	-1.156
Spain	-0.073	-0.498	-0.626	-0.093	-0.073	-0.058
France	1.696*	2.034*	1.564	1.697*	1.671*	1.717*
Austria	0.126	-0.433	-0.317	0.102	0.104	0.220
Germany	0.705	0.445	0.693	0.688	0.515	0.715
Netherlands	1.102*	1.245**	1.035*	1.099*	1.065*	1.071*
UK	0.942	1.141	1.174	1.119	1.391	1.353
Finland	-0.622	-0.497	-0.568	-0.592	-0.627	-0.549
Norway	0.642	0.636	0.487	0.878	0.572	0.815
Czech Rep.	2.667***	2.963***	2.923***	2.740***	2.667***	2.642***
Portugal	0.583	1.279	1.053	0.491	0.583	0.583
Belgium	3.094***	2.910***	3.071***	2.979***	3.094***	3.092***
Slovenia	1.739*	1.693	1.588	1.801*	1.699	1.670
Lithuania	-3.050*	-3.005*	-3.055*	-3.047*	-3.050*	-3.055*
Poland	0.807**	0.549	0.779*	0.807**	0.807**	0.807**
Hungary	-0.439	-0.094	-0.374	-0.143	-0.439	-0.431
Pooled EU	0.665***	0.658***	0.597**	0.668***	0.680***	0.722***
Employment 5 years						
Italy	0.019	0.020	0.022	0.014	0.019	0.018
Spain	0.009	0.020	0.020	0.011	0.010	0.011
France	-0.005	0.007	-0.002	-0.001	-0.009	-0.005
Austria	0.046**	0.034	0.035	0.041*	0.045**	0.045**
Germany	-0.024	-0.024	-0.029	-0.027	-0.024	-0.022
Netherlands	0.001	-0.001	0.002	-0.002	0.002	0.000
UK	-0.020	-0.027	-0.019	-0.009	-0.029	-0.007
Finland	0.004	0.003	-0.001	0.002	0.004	-0.001
Norway	0.019	0.020	0.015	0.023*	0.019	0.027**
Czech Rep.	0.019	0.017	0.023*	0.021*	0.019	0.017
Portugal	0.069*	0.070*	0.072*	0.082**	0.069*	0.072**
Belgium	-0.007	-0.003	-0.005	-0.007	-0.007	-0.007
Slovenia	-0.030	-0.032	-0.018	-0.028	-0.029	-0.036*
Lithuania	-0.059	-0.058	-0.050	-0.060	-0.058	-0.057
Poland	-0.007	-0.012	-0.016	-0.007	-0.007	-0.007
Hungary	0.052	0.054	0.052	0.056	0.052	0.053
Pooled EU	0.006	0.005	0.005	0.005	0.005	0.007
Hourly Earnings 5 years						
Italy	0.118***	0.115***	0.112***	0.120***	0.119***	0.122***
Spain	0.082***	0.071**	0.070**	0.079***	0.079***	0.081***
France	0.053	0.054	0.059*	0.057*	0.056*	0.054
Austria	-0.014	-0.022	-0.006	-0.002	-0.011	-0.006
Germany	0.040	0.040	0.050	0.057*	0.037	0.026
Netherlands	-0.031**	-0.028**	-0.028**	-0.031**	-0.033**	-0.031**
UK	-0.013	0.036	0.039	0.011	-0.017	-0.021
Finland	0.027	0.029	0.029*	0.027	0.025	0.034**
Norway	0.014	0.010	0.016	0.017	0.011	0.018
Czech Rep.	0.097***	0.088***	0.097***	0.095***	0.099***	0.098***
Portugal	-0.013	-0.010	-0.013	-0.006	-0.014	-0.010
Belgium	-0.019	-0.023	-0.029	-0.018	-0.019	-0.017
Slovenia	0.007	0.012	0.008	0.007	0.016	0.011
Lithuania	0.091	0.099	0.119	0.094	0.095	0.113
Poland	0.176***	0.148**	0.101	0.169***	0.176***	0.179***
Hungary	0.020	-0.002	0.012	-0.005	0.022	0.019
Pooled EU	0.040***	0.039***	0.038***	0.044***	0.040***	0.041***

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. The first column reports the controlled estimates from Table 3. For the following columns, see the text in Section 6. *p<0.1, **p<0.05,***p<0.01.

Table B.2 – Robustness exercise – adding university dummies

	$\tilde{\beta}$ without Univ. FE	$\tilde{\beta}$ with Univ. FE	Bounding set	Excludes zero?	Within CI?	Delta for β=0
Time to find 1st job						
Italy	-1.161	0.028	[0.028,1.154]	Yes	Yes	0.0
Spain	-0.073	-0.128	[-0.128,-0.018]	Yes	Yes	1.2
France	1.696*	1.235	[1.235,1.997]	Yes	Yes	-1.1
Austria	0.126	0.161	[0.161,0.329]	Yes	Yes	-0.7
Germany	0.705	0.656	[0.397,0.656]	Yes	Yes	3.7
Netherlands	1.102*	0.928	[0.576,0.928]	Yes	Yes	4.2
UK	0.942	1.137	[1.137,1.441]	Yes	Yes	-1.4
Finland	-0.622	-0.606	[-0.608,-0.606]	Yes	Yes	-2.9
Norway	0.642	0.502	[0.000,0.502]	No	Yes	1.0
Czech Rep.	2.667***	2.656***	[2.656,3.134]	Yes	Yes	-2.5
Belgium	3.094***	3.086***	[2.705,3.086]	Yes	Yes	-2.7
Pooled EU	0.760***	1.000***	[1.000,1.134]	Yes	Yes	21.6
Employment 5 years						
Italy	0.019	0.002	[-0.005,0.002]	No	Yes	0.3
Spain	0.009	0.007	[0.007,0.013]	Yes	Yes	-0.9
France	-0.005	-0.016	[-0.023,-0.016]	Yes	Yes	-1.6
Austria	0.046**	0.047**	[0.047,0.060]	Yes	Yes	-2.0
Germany	-0.024	-0.019	[-0.023,-0.019]	Yes	Yes	-2.1
Netherlands	0.001	0.005	[0.005,0.008]	Yes	Yes	-1.2
UK	-0.020	-0.010	[-0.010,0.018]	No	Yes	0.3
Finland	0.004	-0.001	[-0.001,0.004]	No	Yes	0.2
Norway	0.019	0.013	[0.013,0.017]	Yes	Yes	-1.5
Czech Rep.	0.019	0.018	[0.018,0.021]	Yes	Yes	-2.8
Belgium	-0.007	-0.003	[-0.003,0.001]	No	Yes	0.7
Pooled EU	0.004	0.007	[0.007,0.015]	Yes	Yes	-1.1
Hourly earnings 5 years						
Italy	0.118***	0.091**	[0.068,0.091]	Yes	Yes	4.7
Spain	0.082***	0.076***	[0.019,0.076]	Yes	Yes	1.4
France	0.053	0.034	[-0.070,0.034]	No	No	0.3
Austria	-0.014	-0.015	[-0.015,-0.005]	Yes	Yes	1.5
Germany	0.040	0.031	[0.013,0.031]	Yes	Yes	2.1
Netherlands	-0.031**	-0.025*	[-0.028,-0.025]	Yes	Yes	-2.3
UK	-0.013	-0.006	[-0.006,0.001]	No	Yes	0.9
Finland	0.027	0.021	[0.021,0.046]	Yes	Yes	-0.5
Norway	0.014	-0.002	[-0.035,-0.002]	Yes	Yes	0.0
Czech Rep.	0.097***	0.092***	[0.092,0.104]	Yes	Yes	-3.1
Belgium	-0.019	-0.015	[-0.015,-0.010]	Yes	Yes	38.1
Pooled EU	0.029***	0.027***	[-0.047,0.027]	No	No	0.5

Note: Reflex and Hegesco data, own computations. Reflex surveys university graduates from 1999/2000 and Hegesco surveys university graduates from 2002/2003. The first column reports the controlled estimates without university fixed effects, i.e., the same as presented in Table 3. The estimates for "Pooled EU" are different from those in Table 3 because the five countries not included in this analysis were dropped. The second column shows controlled estimates adding university fixed effects. The last four columns are obtained using Stata command *pscalcv2*, as provided by Oster (2016). See the text for details. *p<0.1, **p<0.05,***p<0.01.