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A Contribution to The Study of Global Competition for Talent: the determinants of student mobility and its consequences for the inter- nationalization of the labor market

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A Contribution to The Study of Global Competition for Talent: the determinants of student mobility and its consequences for the internationalization of the labor market

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Abstract

In a globalized economy the skills of the workforce are a key determinant of the competitiveness of a country. One of the goals of Higher Education is precisely to develop **the students' skills in order to allow them to match the increasing demand for highly** qualified workers while it is simultaneously the best period of life to acquire multicultural skills. For this reason, the European Union has fostered student mobility through several programs: the Erasmus program and the Bologna process are the best known among them.

Although student mobility is a growing phenomenon, publications and research on the subject remain relatively scarce. This paper aims to contribute to that literature through an empirical analysis which exploits a questionnaire submitted to university alumni and focuses on two research questions: what drives studies abroad and what drives expatriation of graduates. Our empirical analysis first shows that exposure to international experiences before entering tertiary education and family background are the main factors influencing student mobility. A second conclusion is that studying abroad increases the international mobility on the labor market. Both confirm previous studies.

Moreover, by making a distinction between participating in the Erasmus program and in other exchange programs or internships abroad, we found that the Erasmus program and the other programs or internships have an equivalent influence on the international mobility on the labor market: they increase by 9 to 12.5 **percentage points a student's chance to be** mobile on the international labor market. This result shows the legitimacy of the Erasmus program, but it also reveals the important impact of other forms of experience abroad. It provides support for policy makers to encourage mobility programs, in order to foster integration of the European labor market.

JEL-codes: : I22, I23, J61, H77

Keywords: Higher Education, mobility of students, Erasmus, mobility of high skilled workers

*"Our progress as a nation can be no swifter
than our progress in education.
The human mind is our fundamental resource."*
John F. Kennedy (1961)
(Special Message to the Congress on Education)

1. Introduction

It is widely acknowledged that in a globalized economy the competitiveness of a country depends on the skills of its workforce. One of the goals of Higher Education (HE) is precisely to **develop the students' skills in order to allow them to match the increasing demand for highly qualified workers**, while it is simultaneously the best period of life to acquire multicultural skills. For this reason, the European Union (EU) has fostered student mobility **through several programs: the Erasmus program whose purpose is to improve the students' language and multicultural skills, and the Bologna process that aims at creating a "European Higher Education Area" (European Commission, 2011)** are the best known among them.

In the volume "OECD Education at Glance 2011" (OECD, 2011), evidence are shown that student mobility is a growing phenomenon. The number of students enrolled in tertiary education outside their home country has reached 3.7 million in 2009, compared to the 0.8 million in 1975; and those figures underestimate the extent of the phenomenon, as they do not take into account some forms of student mobility.¹ Despite that phenomenon, publications and research on the subject remain relatively scarce, especially when it comes to the **"general understanding of issues relating to study abroad and student mobility"** (Streitwieser et al., 2012). This paper attempts to highlight these issues and to provide a better understanding of this phenomenon, through an empirical analysis which exploits the results of a questionnaire submitted to university alumni and focuses on two research questions: what drives studies abroad, on the one hand, and what drives expatriation of graduates, on the other hand.

All in all our empirical results confirm those suggested by the few other contributions available in the literature, like Oosterbeek and Webbink (2009) and on Parey and Waldinger (2010). More precisely, our empirical analysis first shows that exposure to international experiences before entering tertiary education and family background are the main factors influencing student mobility. A second conclusion is that studying abroad increases the international mobility on the labor market.

¹ This figure takes into account the number of students enrolled in a full curriculum outside their home country, it does not include the numerous exchange programs (Erasmus and others) and double degrees offered by many universities.

However, our investigation adds an additional aspect to this literature: by making a distinction between participating in the Erasmus program, and in other exchange programs or internships abroad, we find that the Erasmus program and the other programs or internships have an equivalent influence on the international mobility on the labor market so that both could deserve public support. Indeed the coefficients found for both forms of experience abroad are quite similar: they increase by 9 to 12.5 percentage points a **student's chance to be mobile on the international labor market. This result shows the legitimacy of the Erasmus program, but it also reveals the important impact of other forms of experience abroad; therefore it provides support for policy makers to encourage mobility programs, in order to foster integration of the European labor market.**

The title of this paper refers to that of a report published by the OECD in 2008, "The global competition for talent – mobility of the highly-skilled". We will use this expression without inverted comas, as it is commonly used in many papers and in the newspapers.

In Section 2 below, we depict the general framework in which our research is nested, calling upon such important keywords for the global competition for talents as quality, free-riding and funding. Then in Section 3 we survey contributions related to our research questions, concentrating on empirical studies, in particular on Oosterbeek and Webbink (2009) and on Parey and Waldinger (2010). Section 4 is devoted to our empirical analysis: the determinants of student mobility and the incidence of student mobility on the international mobility of graduates are analyzed; that section is based on the exploitation of a questionnaire submitted to Belgian universities alumni. Finally Section 5 concludes the paper and summarizes its lessons for policy making.

2. General framework

Governments all around the world have fostered student mobility, but the European Union (EU) has implemented the most ambitious higher education policy in order to achieve an integrated labor market. Among the four stages of the EU higher education policy identified by Teichler (2012), the last two are the most important ones: the introduction of the Erasmus program in 1987 and the Bologna declaration of 1999. This last step resulted in the establishment of a common system of study credits called ECTS, an acronym for European Credits Transfer System, and a harmonized university system organized around two main cycles – a three year Bachelor cycle, followed by a two year (most often) Master's cycle. These policy choices were influenced, among other, by the growing economic literature on the positive effect of investments in human capital on economic growth. Research in this field was initiated by Barro (1991) who first showed that the growth of GDP per capita was positively correlated with human capital. His results were confirmed and completed by many scholars; among them Hanushek and Kim (1995) who set forth the positive impact of the quality of education on growth.

Through the Bologna process and the creation of a European area with comparable higher education systems, the European Union wanted to increase student mobility in order to **improve the “productivity of the highly educated” (Mechtenberg & Strausz, 2006).**² European public policies stimulate student mobility and competition between countries and their universities, in order to raise the quality of the education delivered. However, if reaching such aims might be beneficial for the economy as a whole, policy-makers have not anticipated some less desirable consequences that could endanger a non-profit independent higher education system by turning it into a “commercial model” (Knight, 2012).

2.1. Does competition foster the quality of higher education?

The literature on the “global competition for talent” has identified several consequences of increased student mobility on the quality of education. Mechtenberg and Strausz (2006) assess whether the two goals of the Bologna declaration, developing multicultural skills and increasing the quality of universities, are compatible. In particular, they evaluate the extent of the free riding behavior of governments in the context of the financing of higher education. If students are mobile, governments tend to reduce the funding of their higher education system and to send their own students to other countries. Their model shows a trade-off between the two Bologna objectives. On the one hand, if students remain in their home country, the governments choose to improve the quality level of their universities, as they do not fear free riding by other countries, but the students do not gain any multicultural skills. On the other hand, if students are completely mobile, they gain multicultural skills, but the quality of universities is then lowered by the risk of free riding, as governments reduce their higher education funding. The distortion of university quality by student mobility depends on the relative size of the competition effect and of the free rider effect. It is therefore difficult to establish the appropriate level of student mobility that improves at the same time multicultural skills and the quality of education.

The lack of transparency of the higher education market and the possible inability of governmental bodies to assess their quality contributes to the popularity of international rankings, such as by the Shanghai Jiao Tong University (since 2003)³ and the Times Higher

² Mechtenberg and Strausz (2006) explain how an increased mobility of students may help achieving that aim: “First, student mobility across countries exposes students directly to the different European cultures and helps them to develop their multi-cultural skills. These skills are (...) indispensable in a European Union that strives for full economic integration while preserving the diversity of its cultures. Second, increasing student mobility is hoped to kindle a competition between countries to attract the most able students. Since university education in Europe is essentially free, the dimension in which such competition takes place is quality. Hence, it is hoped that higher mobility raises university quality”.

³ Shanghai criteria are (1) *Quality of education*: number of alumni who earned a Nobel Prize or a Fields Medal in mathematics (10%); (2) *Quality of staff*: number of researchers who earned a Nobel Prize in physics, chemistry, medicine or economics and/or the Fields Medal in mathematics since 1911 and number of highly cited researchers in the fields of life science, medicine, physics, engineering and social sciences; (3) *Research output*: number of articles published in Nature and Science between 2006-2010 and number of articles listed in Thompson Scientific’s *Science Citation Index Expanded* and its *Social Sciences Citation Index* in 2010 (20%);

Education⁴ (since 2004). But those and other rankings might be controversial. The creation of those rankings almost at the same time is evidence of the existence of an international market for higher education, where its “consumers”, the students, need a benchmark to choose which “product” suits their needs the best. Finally, it is not clear whether competition contributes to improving the quality of universities; but it has certainly modified the supply of higher education institutions.

2.2. Free riding and funding

Many universities depend on public funding and on the decision of local government. Some consider the quality of higher education as a public good (“the cost of providing a given quality level is independent from the number of students who consume it”) and others as a private good (“costs per quality increase with the number of students”) (Mechtenberg and Strausz, 2006). The allocation of resources to universities also depends on whether a country wants to attract and retain talent, or if it fears the free riding behavior of other governments whose students could benefit from the public funding of the host country and return to their home country after graduation (Gérard, 2007).

Poutvaara (2004) notices that an increasing number of countries have reduced their public provision of higher education; as a consequence, higher education institutions have to find private funding. This author also underlines the incentive for individual countries to free-ride other countries’ higher education system. Even though these former countries are interested in attracting highly-skilled migrants, they will do through lower taxes, not through investing more in education. Kemnitz (2005), through the comparison of investment in education of centralized and decentralized states, shows that governments limit their public funding when students have the possibility to study in another region. The “OECD Education at Glance 2011 report” (OECD, 2011) also describes such a trend. However in most countries, public funding remains the main source of funds for higher education: the share of public funding decreasing from 74% in 1995 to 67% in 2008 (OECD, 2011). This decrease is mainly due to non-European countries. And it is interesting to note that in some European countries (Austria, Portugal, the Slovak Republic and the UK) the share of private funding has increased by ten percentage points between 2000 and 2008.

The evolution of university financing, with an increase in private sources of funds and in tuition fees, is expected to have an incidence on the independence of tertiary education institutions and access to higher education for students from more modest backgrounds.

(4) *Size of the institution*: The weighted score of the above five indicators divided by the number of full-time equivalent academic staff (10%).

(Source: http://www.universityrankings.ch/methodology/shanghai_jiao_tong)

⁴ Times Higher Education ranking criteria are (1) *Teaching* — the learning environment (worth 30 per cent of the overall ranking score); (2) *Research* — volume, income and reputation (worth 30 per cent); (3) *Citations* — research influence (worth 30 per cent); (4) *Industry income* — innovation (worth 2.5 per cent); and (5) *International outlook* — staff, students and research (worth 7.5 per cent).

Even though public funding remains the main source of funds, the higher education system slowly goes from state financing institutions directly to what Milton Friedman asserted in 1955: **"Education spending will be most effective if it relies on parental choice and private initiative – the building blocks of success throughout our society."** With that latter system, **Friedman doesn't preclude government funding of higher education but asks that such funding is channeled through families and students, possibly by means of vouchers, rather than directly paid to educational institutions.**

2.3. Increased private funding

In a 2005 survey of the International Association of Universities (IAU), while 95% of higher education institutions confirm that **"internationalization brings benefits to higher education"**, **"70% also believe** there are substantial risks associated with the international dimension of higher education" with the top-ranked risk being **"the commodification and commercialization of education programs"** (Knight, 2012).

This fear is linked to the increasing competition between universities, which are under pressure to attract talented students, or students able to pay the highest tuition fees. At the same time, higher education institutions are confronted with decreasing public funding. University directors therefore have to raise new sources of funds: either raising tuition fees or finding additional private funds (Machin, 2012). The former raises the issues of equal access to higher education; the latter may be a good solution if the assumption holds that privately funded institutions have more incentive to use funds more efficiently; however they might modify the role of universities.

3. Literature review

In this section, we survey contributions related to our research questions, concentrating on empirical studies, in particular on Oosterbeek and Webbink (2009) and on Parey and Waldinger (2010).

Streitwieser *et al.* (2012) notice that most empirical studies conducted so far on the link **between the mobility of students and that of graduates are "case studies with a relatively small number of students [...] and focused on only one institution"**, like Oosterbeek and Webbink (2009) that focuses on Dutch students receiving scholarships.

Moreover, a simple model can help us finding the right intellectual framework for part of this literature review. Indeed Borjas (1987) explained the decision of a graduate to migrate or to stay in his home country. The young graduate compares the wages in the home country, w_0 , and the wages abroad, w_1 , and takes into account the cost of migration, c . If the wage abroad exceeds the wage at home plus the cost of migration, the individual will decide for

migrating. Borjas also refers to Roy's model (1951), which predicts that the higher is the cost of migration, the lower is the probability to migrate. This approach is important for our purpose since we want to identify whether studying abroad encourages the choice of migration to work in another country, by reducing in a way or another, the cost of that migration. Many aspects of exchange programs indeed, help graduates lowering the search costs of a first job abroad: language skills, local network, and knowledge of the local companies. Parey and Waldinger (2010) have chosen the same hypothesis.

The three papers reviewed below have investigated the probability of having an international career when one has studied abroad. They have contributed to the widespread belief that student mobility influences the mobility on the international labor market. First, the study by Osterbeek and Webbink (2009) provides an interesting result for our research. Using the data on Dutch talented students who were awarded scholarships by the government to study in international prestigious institutions, they find that studying abroad lowers by 30% the chance that those students will live in the Netherlands in the first years of their career. They also showed that every extra month spent studying abroad decreases the propensity to settle down in the Netherlands by 4 to 5 percentage points. Osterbeek and Webbink conclude that there is a negative correlation between studying abroad and **returning to settle down in one's home country.**

Second, Parey and Waldinger (2010) also suggest that studying abroad has an influence on the future professional mobility of graduates; therefore they use as a proxy Erasmus exchanges by students from German universities. They find a highly significant positive relation: studying abroad increases by 15 percentage points the probability of working abroad. Their study also investigates the factors that influence the choice of studying abroad. They also use an Erasmus dummy variable as a proxy, and find that students **enrolled in Erasmus programs have a "probability of studying abroad that increases by about 2.5 percentage points if their department participates in the Erasmus program"** (Parey and Waldinger, 2010, p.16).

Finally, though previous studies used country specific data, von Gordon (2011) conducted her research on a European-wide survey. **In addition, she widened the concept of "studies abroad" to school attendance and to "educational cross-border training initiatives".** Her findings were similar to those of the previous papers and she concluded that studies abroad at all level, not only at university level, also yield a positive correlation with future mobility on the labor market.

4. Empirical analysis

In this section we start describing our data set. Then we turn to the empirical model itself, set forth the two hypotheses to be tested, and present and discuss the results.

4.1. Data description

The data used in this project come from a questionnaire established by a team led by Professor Marcel Gérard at the now Université catholique de Louvain – Mons, formerly the Facultés Universitaires Catholiques de Mons (FUCaM), in the framework of IAP Research Program 6/09 financed by the Belgian Federal Government. This paper is the first analysis of the responses to that questionnaire.⁵ That latter was mainly submitted in French, but also in English, to several Belgian universities: the majority of respondents are graduates in economics or in business from the Université Catholique of Louvain (UCL, 66%) and the Université Libre de Bruxelles (ULB, 16%). 543 graduates have filled out the questionnaire, 90% of them are Belgian; among the other respondents 5% are French. The individuals interviewed are between 24 (born in 1988) and 98 years old (born in 1914), the mean being 39 years old. We may also note that 69% among them are men and 31% are women.

This database might be biased. Indeed individuals were contacted through their respective alumni association. People abroad may not reply for they have lost contact with their university. So the expatriated population might be underestimated. However, we have that 17.5% of the respondents are expatriates, living currently abroad for a company or another organization.

4.1.1. Family background

The database provides detailed information on the level of education of the parents of the interviewees. **Most of the fathers have either a “licence” (for long the standard university degree usually obtained after four years of study at university) or a Master’s degree (25.1%) or a diploma of secondary education (23.2%)⁶, 15.8% have a bachelor or non-university degree, 2.2% completed their education with part-time courses (evening or work-sponsored courses), 17.5% are engineers – including business engineer, a degree which combines management and elements of science and engineering *sensu stricto* – and 7.2% are medical doctors (MD).** When looking at the education level of the mothers, different results come out: a higher percentage only have a secondary education (30.9%) degree, more have a non-university/bachelor **degree (35.5%), and slightly less have a “licence” or a Master’s degree (20.4%)**. The proportion of mothers with an engineer degree is much lower with only 0.74%, as well as the proportion of mothers who are doctors (3.3%).

Furthermore, we know that 21% of the interviewed people have lived abroad during their childhood, thus being from mobile families; and that the mobility of the previous generation depends on their level of education: a higher proportion of people brought up abroad have

⁵ Except the Master’s thesis of Mélanie Voin (Voin, 2012) on which this paper is based.

⁶ We put together in Secondary education diploma, the following categories: Diploma of lower secondary education, Diploma of technical secondary education, Diploma of vocational secondary education and Diploma of general secondary education.

fathers with engineering degrees (29.5%), compared to the ones raised in their home country (14.4%). The database also indicates that 13.8% of the population benefited from an experience abroad before starting university. The most common experience is language training (53.3%), followed by the repetition abroad of the last year of secondary school (26.7%) and by the participation to a development project (6.7%). Being brought up abroad and going to another country before starting university familiarizes the individuals with another culture and language. These experiences are expected to increase the probability of studying abroad during university years.

These observations will be used in the regressions to assess whether the mobility of students is influenced by their socio-cultural background.

4.1.2. Erasmus program

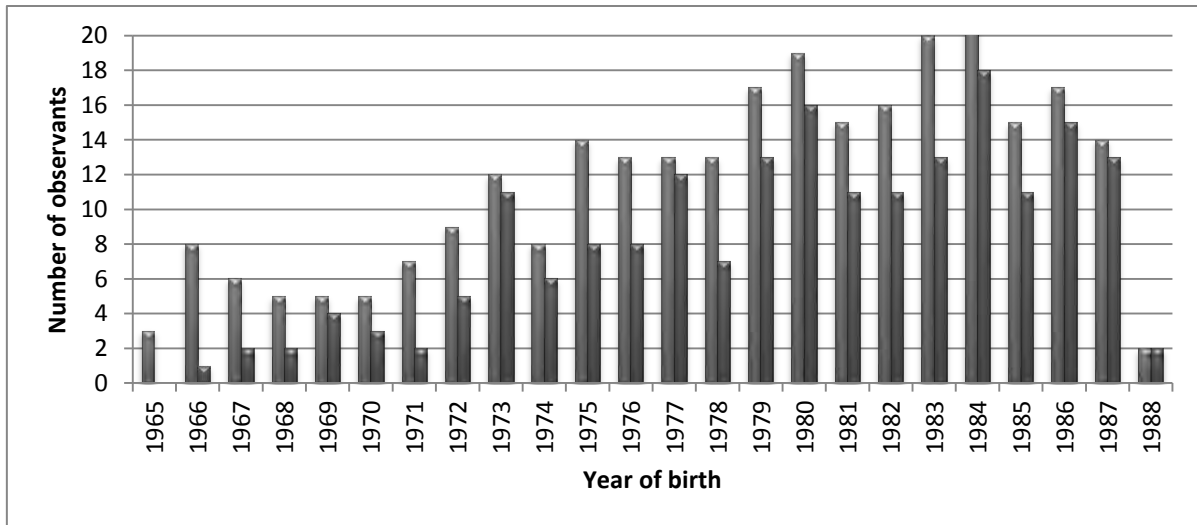
More than 57% of the individuals have studied abroad during their university years, out of which 62.8% benefited from the Erasmus program (launched in 1987), 10% from internships and the remaining 27% from other programs. The main destinations are Anglo-Saxon countries (10.9% went to the United States, 11.2% to Canada, 9.3% to UK) followed by Spain (8.7%), Italy (6.1%), France (5.8%) and Germany (5.1%).

Among those studying abroad 38% benefited from scholarships and for the Erasmus students that figure goes up to 75%.

Interestingly, we may use our database to assess whether the Erasmus program has drastically fostered the number of students enrolled in exchange programs, or if there was already an increasing trend in the number of students studying in another country. For this purpose, we use the variable *Erasmus1*, that represents the number of students enrolled in a first Erasmus program.⁷ In addition, we assume that students benefit from the Erasmus program when they are 22 years old on average (European Commission, 2010). Therefore, if the Erasmus program has drastically fostered the number of students enrolled in exchange programs, we should notice a strong increase in the participation in such programs after 1965. This can be observed on the bar graph below – see Figure 1 where students having studied abroad, including within the Erasmus exchange program, are indicated in light grey and Erasmus students are in dark grey; among people born since 1965 the number of those who had the opportunity to study abroad has clearly picked up, even if the trend started increasing earlier. We also see that most of the stays abroad are nested in an Erasmus exchange: on average Erasmus programs represent 76.8% of the study abroad programs for people born after 1969.

⁷ We also have data available on the second and third Erasmus, but it is not very common (we only have 12 individuals which have studied for a second Erasmus and 2 for a third).

Figure 1: Studying abroad during University years (depending on the year of birth)



Source: own calculation based on data from the questionnaire

4.1.3. Profile of people having studied abroad

When the profile of students who studied abroad is compared to that of those who pursued their studies in their home country, the proportion of individuals with highly-educated parents is higher among the former: 10% of them have a father with a medical doctor's degree, against 3% among those who remained in their home country; the same proportion may be observed for the mothers (5.5% against 0.4%). In contrast, 11% of those who studied only at home have a father who received a sole lower secondary education, against 5.5% of those who studied abroad; those figures amount to 8.7% and 3.5% respectively for the mothers.

In addition, 18.3% of the people who studied in another country had an experience abroad before starting university, against 7.8% of those who studied at home exclusively; corresponding figures are 5.5% and 1.3% respectively for the individuals who repeated their last year of secondary school abroad.

Finally, the financing of studies abroad is also an important factor to take into account. One of the reasons of the success of the Erasmus program may be the fact that most of the Erasmus students benefit from a scholarship: 75% of them benefit from a scholarship, whereas among the students studying abroad outside the Erasmus program, only 25% have benefited from a scholarship.

All these results can be found in Table 1 and give a first hint on how the econometric model should be identified.

Table 1: Profile of people studying abroad

	Studied abroad	Studied in home country
Father's education		
Lower secondary	5.5%	11.3%
"Licence" or Master	28.5%	20.4%
Medical Doctor (MD)	10.27%	3%
Mother's education		
Lower secondary	3.5%	8.7%
"Licence" or Master	26.3%	15.6%
Doctor (MD)	5.46%	0.43%
Experience abroad before university	18.3%	7.8%
Repeating last year of secondary school abroad	5.5%	1.3%
Erasmus program	62.8%	NA
Scholarship	38.8%	NA

Source: own calculation based on data from the questionnaire

4.1.4. Profile of people working abroad

Statistics on expatriates reveal several characteristics of this group: almost 75% of them have studied abroad while at university, 45.3% have benefited from an Erasmus program, 26.3% have been brought up abroad and 21% have had an experience abroad before university. In comparison, a smaller proportion of people working in their home country have studied abroad (55%), less people have benefited from the Erasmus (34%); only 19.4% have been brought up abroad and only 12.3% got the opportunity of staying abroad before university.

If we consider that studies including a stay abroad are more advanced than purely domestic ones, we can say that expatriates of our database have a higher level of education; that confirms the finding of OECD (2008) that a large share of expatriates consists of highly educated individuals.

Our data also show that mobility during professional career depends on the major chosen at university: graduates in economics or in business appear to be more mobile than, say, graduates in political science – see Table 2. Other statistics are also summarized in that table.

Table 2: Profile of people working abroad

	Expatriates	Non-expatriates
Studied abroad	73%	55%
Erasmus	45.3%	34%
Raised abroad	26.3%	19.4%
Experience abroad before university	21%	12.3%
Economics and business	43.2%	36.2%
Political sciences	2.1%	4%

Source: own calculation based on data from the questionnaire.

4.2. Empirical study

Our dataset now allows us to investigate which factors influence the decisions to work and to study abroad. In other words we can now test two hypotheses which correspond to our two research questions: what drives studies abroad, on the one hand, and what drives expatriation of graduates, on the other hand.

4.2.1. Correlation matrix

We have first computed the correlation matrix between the variables of the database that are of interest for the purpose of this study. That matrix helps us selecting the relevant variables for our regressions; an excerpt of that matrix especially relevant for the purpose of this study is proposed in Table 3.

Inspection of the matrix first reveals the correlation between the level of education of the parents and both career abroad after graduation and studies abroad; and those correlations are higher with the level of education of the mother than with that of the father. We also notice the correlation between the dependent variables - i.e. expatriation and stay abroad during university - and experiences abroad before joining higher education. In contrast, living abroad during childhood is surprisingly very weakly correlated with the two dependent variables.

Control variables used in the papers mentioned in Section 2 – like age and gender – do not appear to be significantly correlated with the variables of interest.

Table 3: Main correlations

	Studies abroad	Expatriation
Father's education		
Father with MD degree	.1384	.0784
Mother's education		
Mother with MD degree	.1385	.1043
Mother with "licence" or Master's degree	.1683	.0430
Stays abroad before university		
Experience abroad	.1501	.0966
Cooperation	.0050	.0571
Language courses	.1001	.0371
Repetition of last year of secondary education	.1089	.0386
Stays abroad during university		
Stay abroad	1.0000	.1411
Erasmus1	.6467	.0879
Internship	.1995	.0906
Other	.2859	.0364

Source: own calculation based on data from the questionnaire; MD=Doctor in Medicine

Another interesting result appearing in the matrix is a possible correlation between living abroad before university on the one hand and education of the parents, suggesting that stays abroad before university mainly occur in relatively favored families, in terms of education attainment and, consequently, of income. Those observations confirm the description of the dataset suggested above.

4.2.3. Selection of the variables

The model is organized around two equations that we call hypotheses. The first one aims at studying the determinants of student mobility, the second focuses on the link between mobility during the studies and expatriation.

Hypothesis 1: Determinants of student mobility

For the first hypothesis, our dependent variable is binary *unist* which takes the value 1 when an individual has spent some time abroad during her university studies.

Based on the literature and the correlation matrix, three sets of independent variables are identified. The first one refers to **parents' education**: father with a MD (*faMD*), mother with a MD (*moMD*) or a "licence" or Master's degree (*moMA*); in our dataset that set of variables is

also a proxy for family income. The second one is a singleton and refers to living abroad during childhood (*livab*). The third one refers to experiences abroad before starting university (*uniab*), including stay abroad to learn a foreign language (*ling*) and to repeat the last year of secondary education (*repscd*) respectively.

All those variables contribute to create a family background favorable to experiences abroad: more educated parents, parents with previous experience abroad and parents who already have sent their children abroad, know the value of international experiences for future careers or for being competitive on the international labor market. Similarly, living **abroad with one's family while growing up or going abroad to repeat the last year of secondary school** or for the purposes of learning foreign languages familiarizes young people with other cultures and languages. They will then be more likely to study abroad than people educated in a more domestic environment.

A related issue that we want to address is whether the public support to exchange programs, especially the Erasmus program, stimulates studies abroad of people who otherwise would have stayed at home, and therefore is justified on efficiency grounds; therefore the binary variable illustrating at least one Erasmus stay during the studies (*Erasmus1*) is among the independent variables.

Parey and Walddinger (2010) analyze the propensity to study abroad with the help of the Erasmus variable and other variables such as age, the fact of having a bachelor's degree, apprenticeship and **parents' education**. According to our dataset and the correlation matrix, we will also use as independent variables, the level of education of the parents, experience abroad before university and its decomposition: language courses or repetition of the last year of secondary school. Despite the weak correlation between living abroad during childhood and stay abroad when at university, we will keep the former among the independent variables. Formally, we will use the following equation which allows us to assess the variables that have the largest influence on student mobility,

$$\begin{aligned} \text{unist} = & \beta_0 + \beta_1 \text{erasmus1} + \beta_2 \text{livab} + \beta_3 \text{faMD} + \beta_4 \text{moMA} \\ & + \beta_5 \text{moMD} + \beta_6 \text{uniab} + \beta_7 \text{ling} + \beta_8 \text{repscd} + u \end{aligned} \quad (1)$$

Hypothesis 2: Mobility during the studies and expatriation

As a dependent variable, we now use the binary variable *expat* that indicates whether the graduate now lives and works abroad for a company or another organization. In the set of dependent variables we introduce stays abroad during university (*unist*) and the experiences abroad before university (*uniab*). Further, we modify the variable *unist*, which gathers Erasmus exchange programs, internships and other experiences abroad by removing the Erasmus participants, and testing the Erasmus contribution separately from other stays abroad during university years (*unist2*) in order to see which experience during university

has the largest influence on future professional mobility. In line with von Gordon's (2011) suggestion of its influence on the choice of working abroad, we also introduce living abroad during childhood (*livab*) as a dependent variable.

We can introduce control variables such as parent education and experiences abroad before university, as the dataset provides us with that information. This is similar to Parey and Waldinger (2010), for instance, who use **variables to "control for parental education", with proxies such as the highest degree completed by the parents and the number of years each parent has studied for. Osterbeek and Webbink (2009) also include "father's education" among the control variables of their model. We will use as proxy for the education of the parents whether the mother has a medical doctor's degree (*moMD*).** Formally we estimate,

$$\begin{aligned} \text{Expat} = & \beta_0 + \beta_1 \text{unist2} + \beta_2 \text{erasmus1} + \beta_3 \text{moMD} \\ & + \beta_4 \text{uniab} + \beta_5 \text{livab} + u \end{aligned} \quad (2)$$

4.3. Estimation method

Most of the variables in our dataset are binary variables, including the dependent variables.

Like the studies presented above, we first estimate a linear probability model (LPM), which is **"a multiple regression model when the dependent variable is binary"** (Stock and Watson, 2012). This first step will enable us to confirm the intuitions behind the hypothesis. The three studies mentioned above (Parey and Waldinger, 2009; Oosterbeek and Webbink, 2010; von Gordon, 2011) also start with an OLS step.

However, a problem with this approach is that the probabilities do not necessarily lay between 0 and 1. Therefore, in a second step, the probit model is used. Indeed, when the **dependent variable is binary, "it makes sense to adopt a nonlinear formulation that forces the predicted values to be between 0 and 1"** (Stock and Watson, 2012).

In order to analyse how changes in the independent variables affect the probability of the dependent variable to be equal to 1, we compute Average Marginal Effects (AME), preferred to Marginal Effects at Means (MEM). For the AME, the marginal effect is calculated for each observation and then the effects are averaged, whereas the MEM calculates the marginal effect after setting all the values of the independent variables at their mean value and is, therefore, less precise.

4.4. Results

We first assess the factors influencing the choice of studying abroad. We then focus on the labor market to evaluate whether the EU policy encouraging student mobility as a tool to achieve an integrated EU-wide labor market has reached its goal. To put it in other terms: does student mobility foster international professional mobility?

Most of the estimates presented in Tables 4 and 5 show significant results; some variables however are insignificant which however yielded important results in the papers mentioned above. A comparison of the estimated coefficient will be conducted later on when we will discuss the results. Though, in a first step, we conducted a robust OLS estimation, we focus **our analysis on the results of the probit regressions, and more precisely on the AME's.**

Hypothesis 1 – Studying abroad

A first interesting result is that parents' education is always significant; in particular the level of education of the mother is highly significant at the 0.1% level for a mother with a "licence" or a Master's degree and at the 1% level for a mother with a more advanced degree (typically a medical doctor's degree). Similar education of the father is significant at the 5% level.

If we then analyze the AME, we note that a person whose father is a medical doctor has a 20-23% higher probability to study abroad; the same occurs if she has a mother with a "licence" or a Master's degree. If the mother is a medical doctor, this probability is even higher: the student has almost twice as more chances to study abroad (36-48%).

Not surprisingly, the experience abroad before university yields either significant results at a 5% level for repeating the last year of secondary school or attending language courses, or at 1% or 0.1% level for the variable gathering all experiences abroad before university. Those effects are important, as an experience abroad before university increases the chances of studying abroad by 19-20%. Repeating the last year of secondary school improves that chance by 24.7% and language courses double this probability (49.7%).

The only variable which unexpectedly is not significant is living abroad during childhood; we expected that someone brought up in another country is more open to foreign language and foreign culture, and therefore more likely to go abroad for study purposes.

Unfortunately, the impact of the Erasmus program on student mobility could not be tested with this methodology: 62.8% of the people, who have studied abroad, also have participated to this exchange program; therefore there is a risk of multicollinearity between the two variables (the correlation amounts to 65%).

Hypothesis 2 – Working abroad

The second regression confirms our hypothesis that studying abroad fosters a future international career. The coefficient of the variable *unist2* (internships and other stays abroad but not Erasmus) is most often significant at the 5% level. *Erasmus1* is always significant at that level. When looking at the AME we see that studying abroad during university increases by 11-12% the probability of working abroad after graduation. Participation in the Erasmus program yields similar additional chances. This last result is important in order to assess the impact of the EU's education policy at the origin of this exchange program. The other variables, like mother's education, experience before university, and living abroad during childhood, don't bring significant additional insight to the discussed issue.

Table 4 – Hypothesis 1: Probit results and average marginal effects (AME)

<i>dependent variable</i> unist Variables	(1)	AME (1)	(2)	AME (2)	(3)	AME (3)	(4)	AME(4)
Father MD	0.591* (0.262)	0.201* (0.094)	0.628* (0.262)	0.212* (0.075)	0.630* (0.261)	0.229* (0.094)	0.639* (0.261)	0.233* (0.093)
Mother with licence or Master' degree	0.557*** (0.145)	0.199*** (0.046)	0.584*** (0.145)	0.208*** (0.045)	0.557*** (0.146)	0.203*** (0.051)	0.579*** (0.145)	0.211*** (0.05)
Mother MD	1.350** (0.504)	0.363*** (0.066)	1.343** (0.504)	0.362*** (0.067)	1.321** (0.503)	0.481** (0.182)	1.307** (0.506)	0.477** (0.182)
Experience abroad before university					0.520** (0.175)	0.189** (0.062)	0.548** (0.175)	0.199*** (0.062)
Lived abroad during childhood	0.241 (0.140)	0.087 (0.05)	0.208 (0.141)	0.0757 (0.05)	0.182 (0.141)	0.066 (0.051)		
language courses abroad before university			0.497* (0.231)	0.17* (0.071)				
Repetition last year of secondary school	0.762* (0.433)	0.247* (0.091)						
Constant	- 0.0554 (0.0684)		- 0.0668 (0.0695)		- 0.0885 (0.0707)		-0.00596 (0.0665)	
Observations	543		543		543		543	
Pseudo R ²	0.0694		0.0676		0.0675		0.0653	

Standard error in parenthesis
 * p<0.05; **p<0.01; ***p<0.001

Source: own calculation based on data from questionnaire

Table 5. – Hypothesis 2: Probit results and average marginal effects (AME)

<i>dependent variable</i> expat Variables	(1)	AME (1)	(2)	AME (2)	(3)	AME (3)	(4)	AME(4)
Studies abroad outside Erasmus	0.399* (0.173)	0.103 (0.054)	0.218 (0.151)	0.058 (0.044)	0.413* (0.172)	0.114* (0.055)	0.445** (0.170)	0.124* (0.055)
Studies abroad within Erasmus program	0.0351* (0.151)	0.091* (0.044)			0.398** (0.149)	0.104* (0.045)	0.424** (0.148)	0.112* (0.045)
Mother with MD degree	0.568 (0.315)	0.168 (0.113)	0.675* (0.314)	0.216 (0.118)				
Experience abroad before university	0.268 (0.176)	0.077 (0.053)	0.339 (0.174)	0.095 (0.055)	0.275 (0.175)	0.075 (0.053)		
Lived abroad during childhood	0.179 (0.154)	0.040 (0.043)			0.159 (0.153)	0.041 (0.043)	0.182 (0.152)	0.048 (0.043)
Constant	- 1.272*** (0.114)		- 1.068*** (0.0784)		- 1.266*** (0.114)		-1.245*** (0.113)	
Observations	543		543		543		543	
Pseudo- R ²	0.0406		0.0222		0.0345		0.0291	

Standard error in parenthesis

* p<0.05; **p<0.01;***p<0.001

Source: own calculation based on data from questionnaire

5. Conclusion: discussion of the results and policy lessons

The analysis of the database has revealed the importance of family background in the decision to study abroad. If students come from highly educated families, it is likely that their parents know the benefit of experience abroad for their children and encourage them in that way. Moreover, these families are also more likely to have the financial capacity to offer stays abroad to their children (language courses, repeating the last year of secondary school...), before they enter university. All these factors familiarize young people with living abroad; they often master English when they reach university and are therefore more likely to choose to study abroad.

Statistics presented in Section 4 showed that 75% of people participating to the Erasmus program have benefited from a scholarship. Indeed, the EU provides students who want to participate in that program with financial support in order to make it possible for those from more modest backgrounds to study abroad despite the cost of moving and living in another country. This policy is certainly successful in encouraging student mobility. Osterbeek and Webbink (2009) showed **“that award of a scholarship from the program increases the probability to study abroad from 72% to 97%”**. Our results show that the decision to study abroad is influenced by personal experiences before entering higher education, especially between the end of secondary education and the beginning of tertiary or higher education. Therefore, if we consider it important that the majority of students gain multicultural skills; maybe policy-makers should consider stimulating mobility at an earlier stage.

Our results on labor market mobility confirm those in the literature. Osterbeek and Webbink (2009) found a 30% higher chance to work abroad for talented Dutch students that study in international institutions. This percentage is higher than our results (11.4-12.4% for Non-Erasmus stays, *unist2*, or 9.1-11.2% for Erasmus stays, *Erasmus1*) or than those found by Parey and Waldinger (2010) (15%). This is presumably due to the choice of the database.

An important feature of our paper is its ability to assess which type of experience abroad most influences on the choice of working abroad. We were able to discriminate between taking part in the Erasmus program and doing internships abroad or attending other exchange programs. The coefficients found for both forms of experience abroad were quite similar: they increase by 9 to 12.5 **percentage points a student's chance to be mobile on the international labor market**. This result shows the legitimacy of the Erasmus program, but it also reveals the important impact of other forms of experience abroad. This result provides support for policy makers to encourage mobility programs, in order to foster integration of the European labor market.

Further research could investigate in more detail what other programs can contribute to graduate mobility. Many new double degree programs or twinning programs have been

developed over the recent years (Knight, 2012). Research on this topic could guide university directors when choosing the right formula to develop the multicultural skills of their students, which in turn enable them to have a better employability on the labor market. Policy makers could also be advised to orientate public-spending towards international quality programs.

If the incidence of studying abroad on the international mobility on the labor market is clearly demonstrated by several empirical studies, the decision to study abroad depends on a variety of factors that could be further investigated. The **2011 "OECD education at a glance report"** lists them: **"the academic reputation of particular institutions or programs; the flexibility of programs in counting time spent abroad towards degree requirements; recognition of foreign degrees; the limitations of tertiary education in the home country; restrictive university admission policies at home; geographical, trade or historical links between countries; future job opportunities; cultural aspirations; and government policies to facilitate transfer of credits between home and host institutions"**. (OECD, 2011)

The paper focused on two components of the global competition for talent: student mobility and its determinants, and the incidence of student mobility on the mobility of graduates on the international labor market. Our empirical analysis first shows that the factors influencing students to study abroad are mainly exposure to international experiences (language courses, repeating secondary school abroad...) before entering tertiary education on the one hand, family background on the other hand. A second conclusion we can draw from our database is that studying abroad increases the international mobility on the labor market, thus confirming previous studies. Our study adds an additional aspect to this literature: by making a distinction between participating in the Erasmus program, and in other exchange programs or internships abroad, we found that the Erasmus program and the other programs or internship have an equivalent influence on the international mobility on the labor market so that both could deserve public support.

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