

The determinants of international student mobility flows: an empirical study on the Erasmus programme

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Abstract The Erasmus Programme for higher education students is supposed to play an important socio-economic role within Europe. Erasmus student mobility flows have reached a relevant level of two million since 1987, boosted in recent years by the enlargement of the programme to eastern countries. Thereafter, it seems that flows have staggered. In this context, the article analyses the determinants of Erasmus student mobility establishing relevant hypotheses, which arise from the migration theory and gravity models. A panel data set of bilateral flows for all the participating countries has been used in order to test the factors influencing these student flows. Country size, cost of living, distance, educational background, university quality, the host country language and climate are all found to be significant determinants. Results also reveal that there are other determinants, like a country's characteristics and time effects, which can affect mobility flows. Based on these findings, some general recommendations are put forward to enhance these flows.

Keywords Gravity models · Erasmus student mobility · Erasmus programme · International student mobility · Migration

Introduction

The latest Report from the European Commission, prepared by the European Expert Network on Economics of Education (EENEE 2007), highlights that increased mobility of

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students within the European Union (EU) may be crucial to develop Europe's highly-skilled labour force in order to strengthen its position as a knowledge-based economy. The Report encourages the Commission to further develop the framework of the Bologna Process in which student mobility is of paramount importance. Beyond this central role assigned to student mobility, there is also some evidence proving that studying abroad helps a person to cope more successfully with increasing international dimensions at work and helps with career enhancement, in general (Teichler 2007). It also helps to improve international competences, enabling former students to be placed in visible international professional positions (Bracht et al. 2006) and increases the probability of a person working abroad later in life (Parey and Waldinger 2007). This economic discourse, regarding the benefits of studying abroad, also includes an overlapping socio-cultural discourse about European integration and shared European cultural values, which underlies the relevance of student mobility as a prime mechanism to foster a sense of European identity and citizenship.

Needless to say, the Erasmus Programme, which started in 1987, has been one of the first initiatives to implement the fundamentals of the European Space for Higher Education and lies at the heart of the Bologna Process. In fact, international student mobility within Europe has been given a massive boost by the five successive Erasmus programmes, financed by the EU.¹ During the 21 years of this programme, two million students have moved around the member states of the EU (the EU-27, plus Iceland, Norway and Turkey). During the 4th Erasmus-Socrates phase (2000–2006), annual Erasmus Student Mobility (ESM) growth has been 6% and the average number of students, who moved each year, was 135,000, representing 30% of the total intra-European student mobility. For the current, 5th Erasmus phase (Erasmus-LLP 2007–2013), the goal is to achieve an annual 10% increase in Erasmus flows and reach three million students by 2012. This will augment the participation of tertiary students in the ESM programme, which is still only 0.8%, well below the European Commission's aim.

Curiously, despite the pivotal role assigned to student mobility (the fact that more and more students choose to study abroad and the ambitious goal set by the Commission), there is little research on international student mobility determinants (Findlay et al. 2006) and on ESM.² In fact, there is only soft evidence about the factors influencing International Student Mobility (ISM), mainly based on students' interviews that were trying to assess the questions put forward by researchers (i.e. soft evidence).

The purpose of this paper is to provide an empirical investigation into ESM determinants and give some tentative recommendations that may help to stimulate these flows. After this brief introduction, in the next section we will describe the main patterns at the country level of student mobility flows within the Erasmus programme, in the third section we will discuss the principal hypothesis about ESM determinants in light of the insights arising from migration theory and the limited empirical literature available. Section “[Econometric specification data and empirical findings](#)” is devoted to the model specification in order to test the proposed variables influencing ESM using a panel data set with bilateral flows for all member countries during the past 12 years. We finish the paper with some conclusions and recommendations.

¹ It is important to bear in mind that international student mobility was very low before the inception of the Erasmus Program (Eurostudent 2009).

² However, as it will be made clear below, ESM impulse between EU-16 is facing out since 2000.

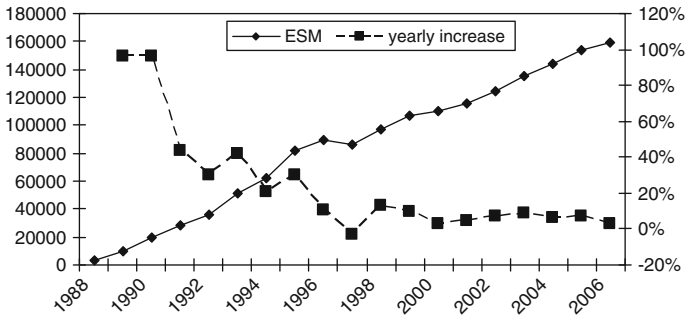


Fig. 1 ESM flows growth rate (1987–2006). *Source* European Commission 2009 and own calculations

The Erasmus programme: stylized facts

This section is intended to show the general characteristics of the variable we want to explain in the econometric model of section “[Econometric specification data and empirical findings](#)”, namely ESM bilateral flows from 1995 to 2006. We describe some facts about ESM flows that should be captured by the model specification. These mainly consist of a general growth in flows but at a different rate between groups of countries (EU-16 and Eastern European countries), the preponderance of large countries in terms of population as home and host countries and the importance of financial considerations (travel and living costs differences).

Created in 1987, Erasmus consists of many different activities implemented by the Directorate of General Education and Culture of the European Commission. Probably the most well-known activity is the student exchange programme, based within Higher Education Institutions. Currently more than 2,000 universities from the EU-27 (plus) countries are participating in Erasmus.

Figure 1 shows us that the number of Erasmus students has been rising, a fact that requires further investigation. At the same time, there is a declining trend in the rate of growth, only interrupted by the entering of new member countries after the Erasmus Programme enlargement in 1998/99.³ These new member countries exerted a positive effect upon ESM figures that lasted until 2003/04. After this, it seems that the effect dissipated. This trend is even more pronounced in relation to the ‘original member countries’ member countries (EU-16).⁴ Based on evidence from Fig. 2, after 21 years, ESM has reached a stationary level among the EU-16 and in English-speaking countries even earlier. This is in contrast to the new participating countries (New), which, until now, were taking an intense advantage of the programme.

However, Fig. 3 reveals that EU-16 countries are still sending more students abroad (in terms of their population) than the group of countries that entered the Erasmus scheme 10 years later (New). This gap may be due to the fact that the EU-16 countries are richer and more able to afford the financial costs of moving abroad or it could also be explained by the nature of the ESM as a *time consuming* phenomenon: in terms of the time it takes to establish proper contacts with new partners before signing the needed

³ The new member countries are: Bulgaria, Czech Republic, Cyprus, Romania, Hungary, Latvia, Lithuania, Slovakia, Slovenia, Estonia, Turkey, Malta, Poland.

⁴ The group of old member countries (EU-16) are: Austria, Belgium, Germany, Denmark, Spain, France, Greece, Italy, Ireland, Iceland, Norway, Holland, Portugal, Sweden, Finland, United Kingdom.

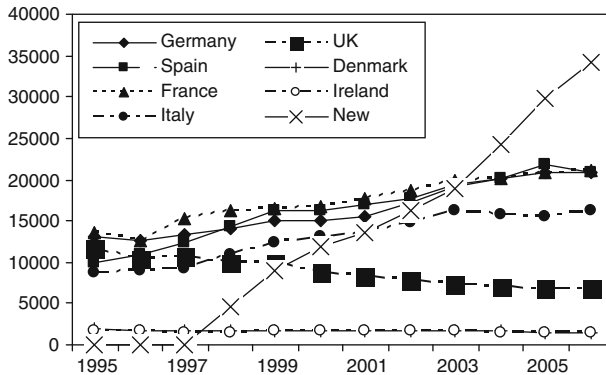


Fig. 2 ESM outgoing flows from EU-16. *Source* European Commission 2009 and own calculations

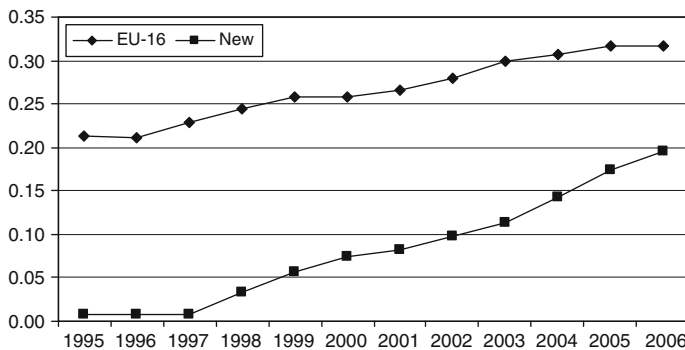


Fig. 3 Ratio of ESM per 1000 population. *Source* European Commission 2009 and own calculations

agreements. The time effect is also illustrated by mobility potentially being influenced by the number of peers that have previously moved, revealing that a decision to move abroad could be subject to some kind of slow demonstration effect. So, it may be the case that there is some persistence in the Erasmus mobility figures.⁵ This means that ESM current flows would depend mainly on previous year flows, so in order to analyse this issue more in depth we will need to take into account this possibility in the model by including time dummies (i.e. previous years as an explanatory variable).

It is for the reasons set out above, that we must separate out both groups of countries in order to ascertain how various parameters have influenced ESM for the subsample of EU-16 (the long runners) and how they differ from those of the new members countries (the short runners). The older countries may have needed different kinds of encouraging measures to achieve the Commission's goal, than those needed for the newer countries.

The number of students received by the top five sending countries (Fig. 4) reveals an expected result, that larger countries in terms of population attract more ESM: the five

⁵ This is a plausible hypothesis because, as shown in Fig. 2, this group of *new* member countries is clearly converging towards the EU-16 countries. In fact, the new group has reached almost exactly the same ratio (0.21) after 9 years (1998–2006) than that reached (0.19) by the *old* group in 1995, also after 9 years (1987–1995).

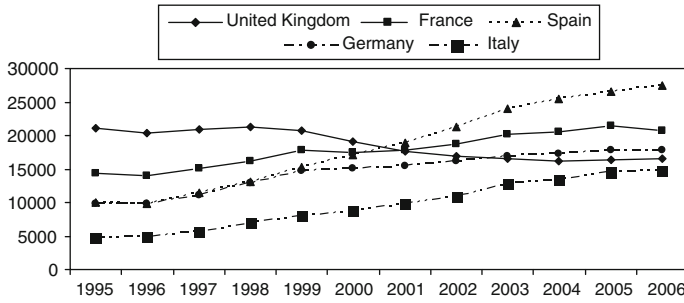


Fig. 4 Erasmus students inflows of the top five receiving countries. *Source* European Commission 2009 and own calculations

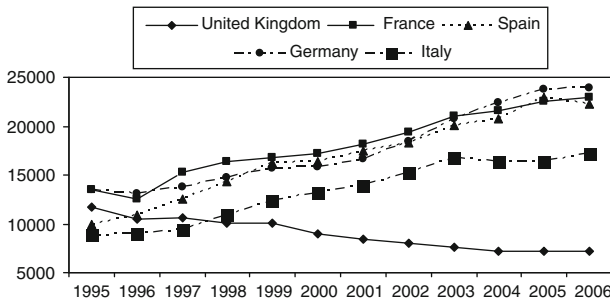


Fig. 5 Erasmus students outflows of the top five sending countries. *Source* European Commission 2009 and own calculations

larger EU countries (Germany, United Kingdom, France, Italy and Spain) are the main destination for ESM. However, there are marked differences between these top five countries, whereas Spain enjoys a sustained increase over the whole period; the United Kingdom’s figures unveil a downward trend throughout the years and the other three are more-or-less stagnant since 2001/02.

The same countries share the highest number of students participating in the Erasmus programme (Fig. 5). However, again, there is a clear difference in the observed time trend in the United Kingdom in comparison with the other countries: this is checked when analysing the decreasing trend that can be observed in the British figures as an Erasmus home country, in contrast with the other countries’ growing number of Erasmus outflows.

In Fig. 6, we have plotted the net flows (in and out) for the five countries with the highest deficit because these disequilibria may shed some light on the country’s special characteristics, which determine their attractiveness and could be taken into account when analysing the variables influencing ESM. There is one country whose Higher Education Institutes (HEIs) attractiveness seems to be well above the others’: United Kingdom (UK). The other two countries with higher net flows are Spain and Sweden, very different destinations as it can be easily understood. In consequence, apart from the prevalence of the UK, it is far from clear which characteristics may be relevant: English language, size, climate, academic quality, etc. On the other hand, it is important to investigate and understand the potential origins of these disequilibria, as these may provoke counter reactions by these host countries that bear the costs of education for the Erasmus foreign

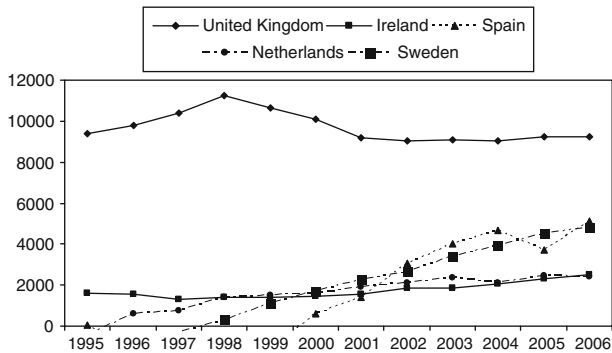


Fig. 6 Net flows of the top five (in-out). *Source* European Commission 2009 and own calculations

students supported by such schemes, without benefiting reciprocally. This may have a negative effect upon mobility.

Exchange students within this programme do not have to pay tuition fees at the host university. Instead, they receive an Erasmus grant from the Commission, which financially supports this programme with budget that has been increasing.⁶ The ESM annual grant per student varies among countries but in general, it is only a fraction of the total annual living costs (Table 1). There are also other national and regional governing bodies providing financial support to ISM and ESM. In this respect, it was an impossible task to obtain reliable data about countries' financial aid and conduct an in-depth investigation into the relevance of this point. However, study findings reported that 53% of the students interviewed know someone who could not go on an Erasmus scheme because of financial constrains (Souto Otero and McCoshan 2006). So, it seems reasonable to look further into financial constrains as a major determinant for ESM.

Literature review and model specification

In this paper we study the motives of ESM. There are many economic, social and other factors that affect the enrolment of international students in a host university. Therefore, it is not surprising that the theoretical approach used in the few existing empirical studies about ISM potential factors is quite broad.

Many interview-type studies start with a *push-pull* framework in order to examine the statements put forward in a questionnaire (Mazzarol and Soutar 2002; King and Ruiz-Gelices 2003; Maringe and Carter 2007), most of the times related to the effect over students' behaviour of having studied abroad, like the willingness to work in foreign countries, or the acquisition of a more 'European' identity or consciousness. This framework is in fact, rather open and descriptive, but serves to arrange systematically all possible factors in a list of push and pull factors. Push factors operate within the home country initiating the student's decision to study overseas. Pull factors operate within the host country to make that country relatively more attractive than other

⁶ ESM budget has increased from 168 million € in 2004, to 201 million € in 2005 and to 204 million € in 2006. For the next 7 years of Erasmus-LLP (2007–2013), the targeted budget is 3.1 billion €.

Table 1 Annual average ESM grant per student in €

	2004	2005	2006
Belgium	835	959	862
Bulgaria	2,477	2,782	2,849
Cyprus	4,172	3,812	4,948
Czech Republic	709	831	754
Denmark	1,309	1,454	1,228
Germany	952	981	871
Greece	2,581	2,141	1,896
Spain	962	988	935
Estonia	1,951	2,336	2,376
France	956	985	881
Hungary	1,532	1,646	1,566
Iceland	1,729	2,052	1,727
Ireland	1,495	1,498	1,290
Italy	1,174	1,213	1,024
Latvia	2,143	2,442	959
Liechtenstein	515	984	1,472
Lithuania	1,165	1,245	3,180
Luxembourg	1,478	2,055	2,398
Malta	2,209	2,177	2,381
Nederland	1,256	1,338	1,088
Norway	1,837	1,651	1,620
Austria	681	801	808
Poland	2,009	1,965	1,822
Portugal	1,213	1,283	1,204
Romania	1,325	1,391	1,401
Slovakia	1,451	1,607	1,846
Slovenia	1,533	1,800	1,674
Finland	896	1,005	864
Sweden	1,707	1,759	1,398
Turkey	2,015	2,334	3,851
United Kingdom	3,067	2,848	2,250

Source European Commission 2009 and own calculations

potential destinations. In the end, it is a combination of both forces that explain ISM. Therefore, when developing the empirical model, we must take into account home and host country characteristics and employ a bilateral country-flow approach (Li and Bray 2007; Mazzarol and Soutar 2002; McMahon 1992). We will especially focus on pull or host-country characteristics, i.e. why students choose one particular host country once they have decided to move. However, this does not mean that we will disregard push factors altogether. In fact, explaining these flows requires that we simultaneously take into account both the host and home factors.

Based on surveys with UK students, Findlay et al. (2006) considered that two factors emerge as pre-eminent barriers to mobility: finance and language. However, they emphasize other factors too, related to the social backgrounds of students, in which the

parents' educational level seems to be more relevant than their occupation.⁷ This attribute was also detected in the Euro-student report 2005–2008 (Eurostudent 2009). In this report, one of the key findings on internationalization and student mobility, which was based on representative and comparable national surveys, was that students from low educated backgrounds tend to perceive all other issues (financial insecurity, lack of support for mobility in the home country, etc.) to be bigger obstacles to mobility, than the average student. The survey of the Socio-Economic Background of ERASMUS students (Souto Otero and McCoshan 2006) also confirms this point: a very large proportion have parents with higher education qualifications and the proportion has not changed a great deal since the last student survey (European Commission 2000).⁸

To develop an hypothesis about the socio/economic determinants of studying overseas, an econometric-type study using an integrative approach to the literature will be developed. This approach uses an open framework that categorizes the motivations or rationales into economic and non-economic factors, highlighting consumer behaviour, human capital, migration and demand theory as the most prominent. Naidoo (2007) for the UK and Liu and Wang (2008) conclude that in general, access to higher education at home, the level of tuition fees in the host country, the level of involvement of the source country in the global economy, government support, relative living expenses and distance are among the most important socio-economic factors influencing ISM.⁹ However, both stress that their studies have limitations, the most important, as far as it reduces the applicability and robustness of their findings, is that their research was limited to one host country and a few home countries.

Economic determinants: traditional migration theory

The study of ISM is a particular element of the migration phenomenon. Although this study aims to describe the determinants of ISM, these do not differ significantly from the determinants that correspond to migration flows, in general, as it has been established in previous recent ISM literature, e.g. in Almeida et al. (2001) or Sá et al. (2004).¹⁰

Therefore, migration theory may reveal some important insights to explain ISM/ESM. The rational choice approach of the cost-benefit models for migration stresses that a

⁷ Students from working-class and non-white backgrounds stand much less chance of engaging in international student mobility because of the financial and linguistic constraints of the environments in which they are embedded and because of the socio-economic and mobility cultures from which they are drawn. They are less likely to opt for, or be admitted to, degree programmes—such as languages—for which a period of study abroad is an integral part (Findlay et al. 2006).

⁸ Another finding regarding parents' occupational background is that Erasmus students exhibit a higher proportion of parents working at executive, professional and technical levels than would be expected for Higher Education students in general, although there is great variation amongst countries and few have economically-inactive or unemployed parents.

⁹ For our study neither access to higher education at home, nor tuition fees could be considered determinants of ESM, because the Erasmus programme is for already-enrolled students and because students within this programme do not pay tuition fees to the host university, but to the university that sent them. Although tuition fees could also be viewed like indicators of quality, and hence could prevent from studying abroad when coming from a high tuition fees HEI (i.e. the UK), since a different measure for the quality of HEI has been chosen in the study, tuition fees have not been taken into consideration as quality indicators.

¹⁰ Sá et al. (2004) find that urban attraction is more important than the quality of a university, as regional student mobility determinants. This study also discovers a downward rent effect in student mobility. Almeida et al. (2001) incorporate data on teaching quality (number of laboratories, teachers' background, number of courses) in order to enhance the basic gravity model.

potential migrant is likely to move if the present value of the anticipated benefits is greater than the monetary costs of moving. It is assumed that the prospects of higher real income levels, associated with labour market employment in the host country, are the main anticipated benefits associated with migration; the main costs are those of transporting the migrant. In our model we choose the geographical distance as a proxy for transport costs associated to studying abroad. Empirical studies have found that real wages and unemployment rate differences between home and hosts countries are important drivers of migration. This approach is not directly applicable to ISM, especially regarding the benefit side of the equation, although many studies reveal that ISM has a positive professional impact on a person's future. In fact, Erasmus mobility is considered an *optional extra*, which would be nice, but not necessary (Eurostudent 2009). This statement stresses that the cost side of the migration equation for ISM is a determinant. One of our basic hypotheses, in line with the empirical studies cited above, stresses the importance of financial constraints or cost variables (like relative living expenses or distance), geographic distance (as a proxy for travel costs), as well as the difference in the cost of living between home and host country. It is suggested that these are the main costs that a moving student has to face under the Erasmus programme. We expect to find a negative effect upon ESM in relation to these two determinants. Some determinants, related to the economic situation of the student inside his home country, can make the Erasmus choice an "*optional extra*" more affordable for the student or household. Therefore, the level of income per capita in the home country may be considered a relevant push factor for ESM. However, the cost of living difference may be enough to reflect the real influence on the costs of studying abroad. We will also need to include other variables, for example the grants that students receive within this programme and the benefits they obtain in some hosts countries (student rent rebate or maintenance support), which reduces living costs, calculated at market prices. However, as already mentioned, we do not have reliable data on this topic. Moreover, public education expenses in the home country may capture the countries' variance financial support for Erasmus students.

Socio-cultural dimension: new migration theory

The new economy of migration, the so-called social choice approach, highlights that migration decisions are taken in social units, such as the family or household, which aggregates the benefits of the group involved in the migration decision. This theory considers that migration is a collective strategy to ensure the economic viability of the domestic unit (Wolf et al. 1997). This is not the case for Erasmus mobility; but the family group's collective decision may be related to those findings, where the social background (occupation and education) of the student is found to be an important determinant. So, based on the new migration theory and in line with Eurostudent surveys, parents' level of education may exert a positive impact on Erasmus mobility figures. Regarding the occupational background of ESM, the level of unemployment in the home country may also be a variable that must be considered as a potentially-negative determinant.

Another idea arising from models of migration, which deals with bounded rationalities in social spaces, may also be relevant to explain ISM/ESM. Psychologically-oriented models of migration begin with potential migrants being rationally bounded, i.e. the individual has a limited capacity to formulate and solve the alternatives they face and to acquire and process relevant information. To cope with these problems, the individual uses a simplified model of the situation and acts rationally but subject to that personal model. The so-called stress-threshold model is based on this assumption of bounded rationality.

According to this view (Wolpert 1965) a potential migrant evaluates the value of their place of residence relative to a threshold, which is a function of their experience or achievements in a particular place and the achievements of their peers. So, migration may be divided into steps. First, the potential migrant takes account of their situation and looks for alternatives abroad. Second, they decide to relocate. These steps are considered highly dependent on how the potential migrant processes the information available in the local place. The term *awareness space* refers to those places about which the potential migrant has knowledge about the value of other places (spaces) from direct contact, friends or relatives, etc. Frequently this theory, in line with the assumption of bounded rationality, considers that the individual's awareness space includes only a subset of all opportunities that are available. The concepts of stress and awareness may be used to explain free, impelled or forced migration. Where stress is extreme, independently of the awareness of migration places, little choice is left and migration is forced; where stress is high most people move and their moves are seen as impelled migration; where stress is low, few people move and their moves can be viewed as free migration. Consequently, we may consider that moving within the Erasmus programme may not be such a free and rational (but bounded) decision, but may be influenced by the number of peers that have previously moved. Anecdotal evidence from Erasmus students reveals that to some extent they are impelled to participate in the program simply because other students have also moved before. In this case ESM may be considered somehow forced and this can be proved by covering a long period of time and using time dummies in the econometric specification.

Gravity models: core variables

Gravity models have become the standard technique for the empirical analysis of international flows of capital (FDI) and goods (trade), whereby flows between a pair of countries is modelled as an increasing function of their size and a decreasing function of the distance between the two countries (Frankel and Rose 2002). However, the logic of the gravity model also underlies migration studies. Among the necessarily-vast number of papers dealing with migration, we have only examined those that employ the gravity model approach as a means of computing a panel of data. In the gravity model approach migration literature, most of the research (up to the present moment) has tried to explain labour force mobility across countries or regions. The majority of articles have attempted to describe the determinants of total labour force migration flows, especially internal migration flows. There are good examples of empirical work on this topic for countries like the United States (Ashby 2007), China (Shen 1999; Poston and Zhang 2008), Germany (Bierens and Kontuly 2008), Hungary (Cseres-Gergely 2004) or Spain (Devillanova and Garcia-Fontes 2004).¹¹

Nevertheless, due to the object of this research, the most relevant articles are those which examine international migration flows. Among the recent existing literature we can mention some articles on international migration to the European Union (Breitenfellner

¹¹ Most of these articles select the same basic range of explanatory variables for migration flows, but also include other original approaches. For instance, Ashby (2007) or Poston and Zhang (2008) find that climatic variables (number of hot days or precipitation) partially explain migration flows; whereas Shen (1999) employs successful population density and GDP growth as exogenous variables with positive impacts on the migration flow dynamics. On the other hand, Devillanova and Garcia-Fontes (2004) resort to unemployment and wage coefficients to understand migration phenomenon; Cseres-Gergely (2004) underline the unemployment relevance too. Bierens and Kontuly (2008) offer a dynamic model including lagged variables in their estimation.

et al. 2008; Warin and Svaton 2008) and to the United States (Karemera et al. 2000) as the two main developed regions that attract foreign immigration. These studies tend to include standard economic explanatory variables like per capita gross domestic product (GDP) or population, sometimes using different transformations in variables, as in Warin and Svaton (2008) where a per capita GDP similarity index is calculated; while in Karemera et al. (2000) there is also an inclusion of political variables (political rights, political instability), which exert a negative impact on migration flows. As a temporary migration of a labour force shares characteristics with ISM and ESM, it is necessary to underline the empirical work that has made a clear distinction between permanent and temporary migration flows: that is the case for Poston and Zhang (2008) or Devillanova and Garcia-Fontes (2004), who insist on working with data derived from the temporary movement of workers across Chinese and Spanish regions, respectively.

In short, the gravity model holds that the number of migrants between two countries is directly proportional to the population in each region/country and indirectly proportional to the squared distance between the out- and the in-migration country. This model is clearly valid for ISM/ESM. It is apparent that the likelihood of a student moving from any home country should increase as the population of that country increases, holding other factors constant. Similarly, the likelihood of a student moving to any host country should increase as the population of the host country increases. This phenomenon will occur to the extent that potentially-large host countries have more universities and can sign more Erasmus bilateral agreements. Regarding geographical distance, it has already been mentioned as a proxy for travel costs, but we can also consider other cultural *distances* that may exert a negative impact on ESM.

Other determinants: language, climate and university quality

As many other surveys reveal (Findlay et al. 2006) language is considered a large barrier, which can prevent people taking part in ISM. However, in the case of ESM,¹² students may go abroad, not only to complement their studies in the host university, for academic reasons, but also to improve their knowledge of foreign languages, especially the most-common languages. Regarding other beliefs about ESM, it is appropriate to consider if climate within the host country plays a role as an attracting determinant. Within Europe, two broad climate types may be distinguished, namely Mediterranean or continental/oceanic. Accepting the fact that tourism is more important for Mediterranean countries, we would expect these countries to correspondingly receive more Erasmus students. Finally, academic considerations should not be disregarded altogether. This is demonstrated by HEIs being more prone to sign Erasmus Agreements with partners that have a high standard of education and also because students may consider this factor relevant to their careers. That is the reason why it is necessary to control for this factor in the specification of the empirical model to which we now turn.

Next section presents the estimation of a regression model where the explained variable Erasmus student bilateral flows depends on the following explanatory variables: distance between capitals, comparative price level in the host country, educational background of home country, population of home country, population of host country, Mediterranean climate of host country, major spoken official language of host country and the number of

¹² It is worth noting that students under the Erasmus programme are not required to prove a certain level of language competence by the host university. This is an incentive to use this programme in order to improve their basic knowledge of a foreign language.

universities in the host country included in Shanghai's Top 200 World Ranking. The hypotheses to test in this model are that the first two variables have negative and the remaining variables have positive impact on the Erasmus student bilateral flows.

Econometric specification data and empirical findings

We have used a panel data econometric specification, with home countries fixed effects, that is different constant terms for each home country (see α_ℓ in (1)). These fixed effects are included in the model in order to take account of any possible home-specific factors that may have an influence on mobility beyond the explanatory variables included to test the main hypotheses discussed.¹³ We have also included time effect because, as already mentioned, ESM seems to be influenced by time (consistent with the new migration theory, which postulates how moving abroad is influenced by the numbers of peers that have previously moved in a persistent manner). Finally, we opted to define different parameters for UE-16 and new entrant countries, to check whether the behaviour of both groups is similar or not.

The extended equation is defined as (1):

$$\begin{aligned}
 Nmovs_{it} = & \sum_{\ell=2}^m \alpha_\ell H_{\ell it} + \sum_{g=2}^T YearD_{git} + \beta_1 PopHome_{UE16it} + \beta_2 PopHost_{UE16it} \\
 & + \beta_3 Dist_{it} UE16it + \beta_4 PlevelHost_{it} UE16it + \beta_4 LangMajoHost_{it} UE16it \\
 & + \beta_6 MediHost_{it} UE16it + \beta_7 RankUniHost_{it} UE16it \\
 & + \beta_8 EduckBackHome_{it} UE16it \\
 & + \beta_9 PopHome_{Newit} + \beta_{10} PopHost_{Newit} \\
 & + \beta_{11} Dist_{it} Newit + \beta_{12} PlevelHost_{it} Newit + \beta_{13} LangMajoHost_{it} Newit \\
 & + \beta_{14} MediHost_{it} Newit + \beta_{15} RankUniHost_{it} Newit \\
 & + \beta_{16} EduckBackHome_{it} Newit \quad i = 1, 2, \dots, N \quad t = 1, 2, \dots, T \quad (1)
 \end{aligned}$$

where m is the number of parent countries and the dummy variable H takes value one when the i -th observation has parent country ℓ at time period t and zero otherwise. Thus, our model allows for different intercepts for each parent country and our approach, as mentioned above, can be called the home country fixed effects approach. The variable $YearD$ stands for time dummy variables for each year, $UE16$ is a dummy variable equal to one for EU-16 countries zero otherwise, New is another dummy variable equal to one for non-UE16 countries and u is the error term. Finally, $N = 812$ is the cross-section and $T = 12$ the time-series sample size. Then, cross section unit i represents one of the 812 possible country pairs (home and host) for the 29 countries included in the sample.

The dependent variable $Nmovs$ is the number of ESM bilateral outflows between every pair of sending and receiving countries. These data were made available directly from the European Commission (Directorate General for Education and Culture) for the years 1995 to 2006 and for 29 countries (EU-16 and new member countries). So, in the end, we arrived at 812 country pairs and 7,293 observations (12 years for UE-16 countries and 8 or 9 years for new entrant countries).

Regarding the core variables from the gravity model, $PopHome$ and $PopHost$ is home and host country population, measured in 1,000; and $Dist$ is the distance between main

¹³ We rejected a random effects model because all the countries participate in the Erasmus Programme.

capitals in kilometres. The variable *PlevelHost* is the host country comparative price level (EU-27 = 100) of final consumption by private households, including indirect taxes. The other four variables are: *PopTertHome* for the total number of population with tertiary studies (ISCED 5–6) in the home country as a proxy for the educational background Erasmus students;¹⁴ *RankUniHost* is the total number of host country universities appearing in the TOP 200 Shanghai world ranking; *LangMajoHost* is a dummy variable with 1 if host country official language is a major one and 0 otherwise; *MediHost* is a dummy variable taking the value 1 if the host or receiving country is Mediterranean (see [Annex](#) for data source and descriptive statistics). Equation (1) has been estimated by ordinary least squares, taking into account possible heteroskedasticity using the White's estimator of the covariance matrix (White 1980).

As Table 2 shows, time dummies reveal that ESM has an endogenous growing time trend. This result is consistent with the theoretical assumption made about the persistence of ISM. It shows that it is a migration-type phenomenon, where a forced mobility is apparent, which is dependent on the subjective pressure that the number of past students (who have participated in this programme) exert on current mobility. On the other hand, the restriction of equal parameter values for both country groups is rejected. This confirms that the variables explaining ESM for both country groups have different weights.

The proposed model seems to render quite reasonable results: all the variables have the expected signs presented in the first column of Table 2 (except the price level for the new member country group) and the estimated parameters are significant (except home country population and the Mediterranean dummy for the new member countries group). Core variables, arising from the gravity model, are undoubtedly important; whereas population exerts a positive impact and geographical distance is inversely related to ESM. Both dummy variables, regarding language and climate, seem to be relevant pull factors that make host countries more attractive. The sign of the variable that captures the quality of HEIs reveals that there is a positive relationship between the host countries chosen by students and the general academic prestige of those countries. Also, an important result obtained here, is that the typical assumption made about the higher educational background of mobile students is confirmed.

All parameters for the EU-16 have a higher absolute value, except for the price level that seems to have the wrong sign for the group of new member countries. This result may confirm the idea that ESM for this country group have reached maximum potential and that new member countries have not. Regarding the *wrong* sign of the price level variable for the new member countries, a possible explanation is that, within these countries, ESM has not yet spread to lower- or middle-income groups, as in the EU-16, which makes ESM a high-class privilege.

An overall revision of the individual results shown above allows us to view the European student mobility as a dual phenomenon. On the one hand, student mobility is influenced by economic variables, such as the price level of host countries or the geographical distance as a proxy for transport costs, a finding that links student mobility to migration flows, since they share similar characteristics. The positive impact of variables like the HE institutions quality or the Host country's Language relevance seems as well to support this first interpretation: the student will attempt to find the most suitable destination taken into consideration his future

¹⁴ We use the total number of graduates for the whole (home) country as a proxy for the educational background of Erasmus students because there are no specific data for them. We assume therefore that a country where the total number of graduates is high has also Erasmus students with higher educational background than another with a lower number of graduates.

Table 2 Home country fixed effects estimation

Expect. sign	Variable	Coefficient	<i>t</i> -stat.	<i>p</i> value
UE-16				
(+)	Home country population	0.036	1.64	0.10
(+)	Host country population	0.005	2.98	<0.01
(-)	Distance	-0.146	-10.65	<0.01
(-)	Host country price level	-0.453	-1.88	0.05
(+)	Host country language major	161.964	6.92	<0.01
(?)	Receiving country Mediterranean	312.428	7.44	<0.01
(+)	Universities' world ranking	26.503	3.65	0.00
(+)	Population tertiary home	0.001	1.70	0.10
New				
(+)	Home country population	0.022	0.97	0.32
(+)	Host country population	0.002	8.01	<0.01
(-)	Distance	-0.020	-6.17	<0.01
(-)	Host country price level	0.825	8.53	<0.01
(+)	Host country language major	1.857	4.58	<0.01
(?)	Receiving country Mediterranean	4.295	0.46	0.64
(+)	Universities' world ranking	3.102	3.25	0.01
(+)	Population Tertiary Home	0.000	1.76	0.07
Time dummies				
	1996	-2.502	-0.05	0.95
	1997	21.294	0.42	0.67
	1998	41.395	0.96	0.33
	1999	65.843	1.62	0.10
	2000	63.288	1.57	0.11
	2001	65.661	1.63	0.10
	2002	70.339	1.74	0.08
	2003	81.578	2.00	0.04
	2004	78.190	1.94	0.05
	2005	83.181	2.07	0.03
	2006	83.589	2.09	0.03

Unadjusted $R^2 = 0.516$, Adjusted $R^2 = 0.513$

prospects of employment and career promotion. On the other hand, the observed tendency to choose countries whose climate is warm, above other considerations, leaves us the notion of student mobility as a leisure activity, as if European students collectively were trying to enjoy from the lifelong unique experience of living abroad.

This ambiguity suggests that public support should adapt different policy measures to the above described special nature of student mobility, with the purpose of solely encouraging that kind of mobility exclusively related to learning objectives.

Conclusions and recommendations

Over the last three decades the EU has carried out an ambitious attempt to integrate HEIs from member countries with the purpose of enhancing a high-skilled labour force, promote

a deeper cultural integration and contribute to build a sense of European identity. The Erasmus program supported financially by the EU has played a key role in these objectives, increasing quite considerably student mobility flows. However, in order to implement measures to boost these flows even further, it is necessary to ascertain the factors influencing student mobility.

To the best of our knowledge this article is one of the few attempts to analyse the behaviour of Student Mobility: an estimation of the quantitative direct impact of several determinants of student flows has been carried out, something that has helped us expose an array of policy recommendations which could seem to be driven by common sense, but have the advantage of sharing clear empirical evidence based on the robustness of the proposed quantitative analysis.

A main finding of the study is that despite the financial support granted by the EU and other institutions, the cost of living differences and distance are still relevant when explaining ESM flows. So it is evident that more economic support could enhance ESM. Another way to increase ESM figures could be to sign more agreements with neighbouring countries.

The educational background of a family is a classical factor when explaining academic performance; in this study, the number of population with tertiary studies shows a positive relationship with ESM, suggesting there is an influence of the educational background at the country level towards encouraging ISM. Linked to this result is the role that time plays in this kind of empirical research. There is a possibility as the new migration theory states, that students could imitate others' behaviour. The inclusion of time-fixed effects which improves the model significance confirms this interpretation. This demonstration effect leads us to suggest that informing the pool of home students about the experiences of past Erasmus students may work towards increasing mobility.

In terms of the results in relation to language, it seems that ESM, instead of being discouraged by the lack of knowledge of foreign languages, is actually used by the mobile students as an opportunity to learn or improve a major spoken foreign language. So, in order to attract more students, it would be wise for HEIs to offer subjects taught in those major, spoken languages.

We have obtained as well, that HEIs belonging to the TOP 200 Shanghai quality ranking universities represents a significant pull factor. Consequently another possible recommendation that would encourage mobility would be better marketing of the academic quality levels in a host country and implementing any required measures to improve the position in academic rankings.

The inclusion of variables related to climate condition differences is common within migration literature. The ESM seems to be biased towards the Mediterranean countries, which share the best climate. This result must be interpreted as a usage of EP as a means of easily accessing leisure activities by students enrolled in the programme. So, evidence suggests that despite the academic purposes behind the inception of this programme, there is a real danger of misusing public funds to finance leisure pursuits.

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Annex

See Table 3.

Table 3 List of variables in Eq. (1) and summary statistics

Variable	Definition	Unit	Source	Mean	Min	Max	SD	Skewness
<i>Nmoys</i>	Erasmus student bilateral flows		DGEC (European Commission)	191,105	0	6,350	479,075	
<i>Dist</i>	Distance between capitals	Kilometers	CEPII database	1572,700	59,617	4,882,100	828,91	0.639
<i>PlevelHost</i>	Comparative price level of final consumption by private households including indirect taxes, host country	Index EU-27 average 100	Eurostat	86,476	27,700	153,300	31,460	0.016
Population	Population with tertiary studies of home country: number of graduates (ISCEAD 5–6)		Eurostat	111,560	650	643,600	154,230	1.816
<i>PopHome</i>	Population of home country	1,000	Eurostat	19,198	267,470	82,520	23,470	1.374
<i>PopHost</i>	Population of host country	1,000	Eurostat	19,198	267,470	82,520	23,470	1.374
<i>MediHost</i>	Mediterranean climate of host country (Portugal, Spain, France, Italy, Greece, Malta, Cyprus and Turkey)	1 if Mediterranean; 0 otherwise		0,206	0	1	0,405	1,447
<i>LangMajorHost</i>	Major spoken official Language of host country (<i>English, Spanish, Italian, French, German</i>)	1 if Major; 0 otherwise		0,310	0	1	0,462	0,819
<i>RankUniHost</i>	Number of universities in the host country included in Shanghai's Top 200 World Ranking		Shanghai's Academic Ranking of World Universities	2,379	0	22	4,714	2,529

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