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Studying Abroad and the Effect on International Labor Market Mobility: Evidence from the Introduction of ERASMUS

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ABSTRACT

Studying Abroad and the Effect on International Labor Market Mobility: Evidence from the Introduction of ERASMUS*

We investigate the effect of studying abroad on international labor market mobility later in life for university graduates. As a source of identifying variation, we exploit the introduction and expansion of the European ERASMUS student exchange program, which significantly increases a student's probability of studying abroad. Using an Instrument Variable approach we control for unobserved heterogeneity between individuals who studied abroad and those who did not. Our results indicate that student exchange mobility is an important determinant of later international labor market mobility: We find that studying abroad increases an individual's probability of working in a foreign country by about 15 to 20 percentage points, suggesting that study abroad spells are an important channel to later migration. We investigate heterogeneity in returns and find that studying abroad has a stronger effect for credit constrained students. Furthermore, we suggest mechanisms through which the effect of studying abroad may operate. Our results are robust to a number of specification checks.

JEL Classification: J61, I2, F22

Keywords: international mobility, migration, student exchange, education

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1 Introduction

International labor market migration has risen dramatically in the recent past, especially among university graduates. Lowell (2007), for example, shows an increase in the emigration rate of university graduates from about 4 percent in 1980 to about 7 percent in 2000 in developed countries. The increased demand for skilled labor and the importance of highly skilled individuals for innovation has induced many countries to implement policies geared to attracting skilled migrants from abroad (OECD, 2002). Understanding the determinants of migration is key to formulating such policies. While attention has traditionally focused on wage differentials, going back to Hicks (1932)[1], it is clear that individual characteristics play an important role in determining the skilled worker's propensity to migrate. One possible determinant which has received particular attention of policymakers over the past years is student mobility during tertiary education. In particular, it has been hypothesized that student mobility may act as a 'stepping stone' for later labor migration (Guellec & Cervantes, 2001). Numerous countries, including the United States, Japan, and the United Kingdom, attempt to attract highly skilled mobile workers through policies relating to student mobility programs (Guellec & Cervantes, 2001).These are based on the assumption that student mobility has a genuine effect on later labor market mobility. Despite the widespread belief in the link between studying abroad and international labor market mobility, empirical evidence is very limited. Establishing a causal link between studying abroad and labor market mobility later in life is a challenging task because students who decide to study abroad are in many ways different from students who undertake all of their education in their home country. The unobserved heterogeneity may also affect the decision of working abroad later in life. This may introduce a bias in OLS estimates of the effect of studying abroad on subsequent international labor migration decision. In this paper, we provide evidence on the *causal* effect of studying abroad on later labor market mobility by exploiting an exogenous change in student mobility: the introduction of the ERASMUS student exchange program.

This program has been devised by the European Union to foster student exchange in Europe. Introduced in 1987 it offers the possibility of studying in another European country for up to 12 months at very low cost. Different universities and different departments introduced the program at very different times. We exploit the variation in scholarship availability as a source of exogenous variation in a student's probability to study abroad. In order to ascertain a student's exposure to the ERASMUS program we construct a unique data set, containing annual information on the number of exchange places for each subject at every German university. In order to assess the effect of studying abroad on international mobility later in life we merge this data to a survey of

[1]For surveys on determinants of migration, see Greenwood (1975, 1985, 1997).

German university graduates. We first show that the ERASMUS program has a strong impact on a student's probability of studying abroad. We then use the department level variation in international student exchange programs to identify the causal effect of studying abroad on the decision of working in a foreign country later in life. We find that studying abroad increases a person's probability of working abroad by about 15–20 percentage points. This result suggests a strong causal link between international labor market mobility and previous international mobility. Qualitative evidence suggests that besides career concerns soft factors such as interest in foreign cultures or living with a foreign partner are important determinants for the decision to work abroad, and we suggest that the effect of studying abroad may work through these channels.

There are some papers analyzing the link between labor market mobility and previous mobility. Kodrzycki (2001) provides descriptive evidence on inter-state mobility in the US and links it to the preceding decision of attending college out of state.[2] Malamud & Wozniak (2006) study the effect of the decision to go to college on interregional mobility in the US. Using an instrumental variables approach to control for selection effects they find that attending college increases the probablility of residing out of state later in life by about 20 percentage points. The link between *international* student mobility and the decision to work abroad after graduation has rarely been studied to date. One reason is data availability: Most surveys do not contain information on study abroad spells during a student's undergraduate career, and graduates who work abroad are generally not sampled in national surveys of the sending countries. The available evidence is based on surveys of students. Jahr and Teichler (2001) use data from a survey of European university graduates. They investigate the effect of studying abroad on later international labor market mobility without controlling for possible selection of formerly mobile students. They find that formerly mobile students are between 15 and 18 percentage points more likely to work in a foreign country after graduation. Dreher and Poutvaara (2005) investigate the role of student mobility in explaining aggregate migration flows in a cross-country panel study, focusing on migration to the United States. They find strong effects of previous period's number of foreign students on current period's number of migrants, indicating that a ten percent increase in the number of foreign students increases subsequent migration by around 0.5 percent.

The paper which is most closely related to ours is a study by Oosterbeek and Webbink (2006). They employ a regression discontinuity design to control for unobserved heterogeneity between internationally mobile and nonmobile students. Using data on talented Dutch university students they find that studying abroad increases the probability of living in a foreign country by about 50 percentage points. A key difference to our work is that they look at a small sample of particularly talented students, while we use

[2] She finds that individuals who attended college out of state are 54 percent more likely to live out-of-state five years after graduation. These results, however, cannot be interpreted as causal effects as she does not address the selection issues affecting mobility decisions.

a nationally representative survey of German university graduates. Another important difference is that Oosterbeek and Webbink investigate the effect of *postgraduate* studies abroad. Students pursuing a postgraduate degree abroad may remain in the receiving country while looking for work. Part of the effect they find may also be driven by the fact that some of the respondents abroad are still enrolled in higher education at the time of the survey. In contrast, in our work, the intervention is international mobility during the undergraduate career, after which students return to complete their degree in Germany. Thus, our research design allows us – and in fact forces us – to separate the two mobility investments (studying abroad and working abroad). The effect we find is therefore informative about the dynamic effects of earlier mobility investments.

This paper presents evidence that previous educational mobility is a very important determinant of mobility later in life. We thus establish a causal link of previous mobility decision to mobility later in life. This highlights the importance of taking earlier mobility into account in economic modeling but also for policy decisions. The European Union, for example, tries to foster labor market mobility in the EU (see "Commission's Action Plan for skills and mobility" (2002)). Our research suggests that supporting international student mobility is a very successful policy instrument to foster labor market mobility later in life. Our results on the effect of the ERASMUS program on the probability of studying abroad also show that exchange programs are indeed effective in promoting student mobility. This will be important to policy makers as they spend large public funds on these programs.

The paper proceeds as follows: The next section briefly describes the data we are using. Section 3 outlines our identification strategy. We then present the first stage results and provide evidence that our instruments are both powerful and operate very precisely in the way we claim they do. The following section present the main results and a number of sensitivity checks. We present descriptive evidence into the channels which lead students who studied abroad to work abroad later on. The last section concludes.

2 Data

We use data on German university graduates, which has been collected by the Higher Education Information System (HIS) institute. This survey is conducted to provide a nationally representative longitudinal sample of university graduates in Germany. A sample of university graduates has been drawn from cohorts graduating in the academic years 1988-89, 1992-93, 1996-97, and 2000-01. In the following, we will refer to these four cross-sections as graduate cohorts 1989, 1993, 1997, and 2001. Graduates in each cohort are surveyed twice. The first survey takes place about 12 months after graduation (the *Initial Survey*). The same individuals participate in a follow-up survey about 5 years

after entering the labor market (*Follow-Up Survey*).[3] The following Figure 1 illustrates the timing of the different surveys.

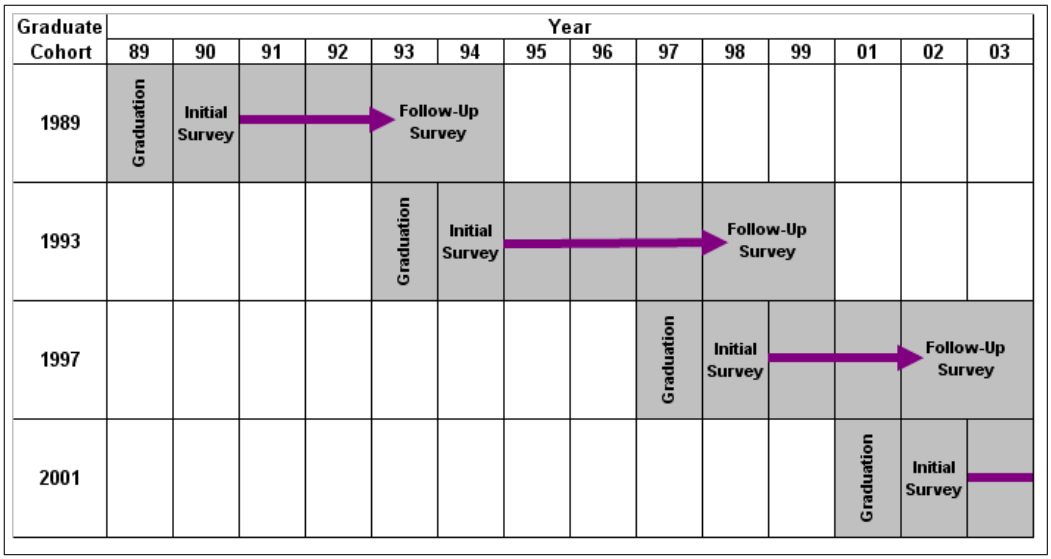

Figure 1: HIS Data

The data contains detailed information on the students' background, study history, and labor market characteristics. This allows us to relate study decisions, in particular international educational mobility, to later labor market outcomes. A large advantage of this dataset lies in the fact that individuals graduating from a university in Germany are followed even if they move to a foreign country. This feature makes this dataset particularly valuable to investigate questions concerning international mobility.

The data and the sampling process is described in detail in Briedis & Minks (2004). The sample was drawn as follows: For each cohort, university-subject-degree combinations where sampled randomly, and the respective universities mailed the questionnaire to each student who had graduated within the corresponding academic year. This procedure ensures that the sample contains individuals from a large number of different institutions and subjects. One key advantage of the data is that the population of interest includes all university graduates who completed their studies during a given academic year at any institution of higher education in Germany. The higher education system in Germany consists of a number of different university types catering to different types of students. We include five main types of higher education institutions in our estimation. This includes not only the traditional universities *(Universitäten)* but also the so-called Universities of Applied Sciences *(Fachhochschulen)*, the Comprehensive Universities *(Gesamthochschulen)*, the Colleges of Art and Music *(Kunst- und Musikakademien)*, and the Theological Universities *(Theologische Hochschulen)*.[4] The

[3] For the 2001 cohort, only the initial survey is available so far.

[4] All institutions in our sample would be called universities in most countries outside Germany.

response rate to the survey is around 25%. While of course a higher response rate would be desirable, an analysis conducted by the HIS has come to the conclusion that the characteristics of the survey respondents are close to those of the target population. The total number of respondents in our data corresponding to the four cohorts is 8,153 (1989), 6,737 (1993), 6,220 (1997), and 8,103 (2001).

The key information for our purposes is whether the student has studied abroad during her undergraduate studies, and whether the graduate works abroad at the time of the survey. We infer undergraduate mobility from the first question of the questionnaire, which asks the student to report her complete enrollment history. Respondents are instructed to report each change of degree program or university. The questionnaire makes explicit reference to study abroad as one form of change in status in the 2001 survey. We use this information to construct an indicator of whether the student studied abroad during her undergraduate career. In order to exclude university mobility after finishing the first degree (e.g. to obtain a Master abroad), we only look at international mobility before the graduation date of the first degree. It is important to note that only students who obtain their degree in Germany are surveyed. We are, therefore, not able to observe students who first enrol in Germany and subsequently move to a foreign university and obtain their degree abroad. Also Germans who complete all of their higher education abroad are not included in our sample. These individuals may be different to students who study abroad as part of their degree in Germany. It is quite likely that those who complete their higher education abroad are even more likely to work in a foreign country after graduation than students who obtain their degree in Germany. If this was true we would underestimate the effect of studying abroad. Unfortunately, our data is not suitable to test this hypothesis.

For all students who have ever participated in the labor market, both the initial and the follow-up surveys contain questions about the current (or the last) employment, including the location of work. We infer from this question whether a former student now works in Germany or abroad, and create an indicator accordingly.

The following figure shows the percentages of studying abroad and working abroad (from the initial survey, one year after graduation) for the four graduation cohorts. It can be seen that both studying abroad and working abroad occurs more frequently among students of later graduation cohorts. It is important to note that we include dummies for the four graduation cohorts in all our regressions. Therefore, we do not identify the effect of studying abroad from the overall time-trend in the two variables. In fact, in our sensitivity analysis, we show that our results are robust to allowing for not only a general time trend, but also for subject-specific time trends.

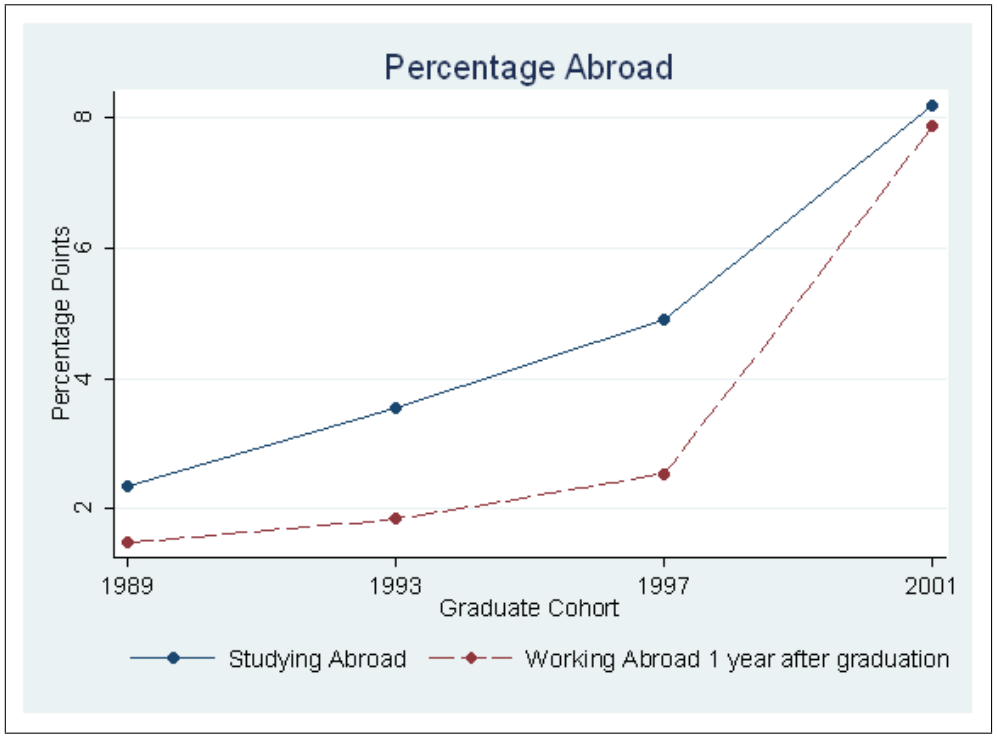

Figure 2: International Mobility in HIS Data

These percentages can be compared to information on international mobility from other data sources. Isserstedt & Schnitzler (2002) point out that different data sources use different ways to collect data and different definitions of a stay abroad. These differences may result in different estimates of student mobility. With this caveat in mind, we compare the incidence of international educational mobility in our data to data from the 16th Social Survey (*Sozialerhebung*), a large-scale survey of German students in 2000. Of all students surveyed in the Social Survey, about 13 percent of advanced students indicate that they spent part of their studies at a foreign university. While this number is larger than ours, it seems roughly comparable: The students interviewed in the Social Survey in 2000 will on average belong to a later graduate cohort than the academic year 2000/2001, which corresponds to our last cohort. Also, our definition relies on students spending at least one term at a foreign university. Thus, short term exchange will be included in the figure of the Social Survey, but not in ours. The figures from the Social Survey also replicate the strong over-time increase in the fraction of students who study abroad.

With similar caution we use data from the OECD Factbook 2006 to investigate the reliability of our data with respect to international labor market mobility. The OECD estimates that about 5.5 percent of Germans holding a university degree worked as expatriates in an OECD country in the year 2001. This number is lower than the percentage of people working abroad for the 2001 cohort in our dataset. This can be explained by the following two facts: First, the OECD calculates its estimate of expatriates by

considering migration to the OECD countries only, while our number includes people working abroad anywhere in the world. Second, differences may also be driven by different methodologies of estimating outmigration: the OECD captures stocks of people abroad while we look at the outflow of graduates from a certain cohort.

We conclude that both the percentage of people studying abroad and the percentage of people working abroad in our data are comparable to estimates from other data sources. This is reassuring as there may be a worry that response rates to the the HIS survey may differ for people living abroad. Unfortunately, there is no direct way of testing for differential response rates as we do not have any information on the individuals who do not respond to the HIS survey. One way of addressing this concern is to show that other data sources with different sampling frames exhibit similar numbers to our data.

In addition to the international mobility variables we also use a number of other control variables measured at the individual level. We create a measure of potential experience since graduation, defined as the number of months from graduation to the time of answering the questionnaire.[5] We take this measure of potential experience rather than actual labor market experience, because actual labor market experience could be affected by a study period abroad and might then be endogenous to our outcome. Other controls include a female indicator and an indicator for whether the student completed an apprenticeship before beginning her university studies. We also use variables which control for a students' earlier mobility decisions. In particular we include a variable which controls for whether the student's first university enrollment occurs in the state *(Bundesland)* where she obtained her final high school degree. Furthermore, we include the distance between the state of her university enrollment and the state where she obtained her high school degree.

We use a number of variables to control for a student's parental background. To control for parental education we use a variable that indicates the highest grade completed by either parent, where we split parental education into three categories to account for the characteristics of the education system in Germany. The omitted category contains students with parents who obtained up to 13 years of education. This group consists of students with parents who did not receive a school degree (very few), parents with lower types of secondary schooling *(Hauptschule or Realschule)* usually followed by an apprenticeship, and parents who obtained a high school degree but no further education (very few). The second group is comprised of students where the better educated parent either obtained an advanced craftsmanship degree *(Meister)* or some higher education, such as a degree from a university of applied science *(Fachhochschule)* but not a de-

[5] There is some variation in experience because students were sampled according to whether their graduation fell in a particular academic year. Students graduating at the beginning of the academic year therefore have more potential experience than those graduating towards the end of the year. In addition, there is some variation with respect to when the questionnaires were sent out and how quickly graduates responded.

gree from a university. The third group includes students who have at least one parent holding a university degree.[6] We also construct indicator variables in five categories for each parent to control for parental occupation. As a proxy for credit constraints we use an indicator variable whether the student ever received federal financial assistance (BAFOEG). Students are eligible to this assistance if parental income is below a certain threshold. This threshold varies according to the number of children who are enrolled in a formal education program.

In order to implement our Instrumental Variables strategy we combine the HIS graduate survey data with a unique dataset of ERASMUS participation. There is no readily available data on the ERASMUS exchange program for our time period of interest. We obtained date on the number of ERASMUS scholarship holders for each year and each participating institution on a subject-by-subject basis from 1993/94 to 1999/2000 from The German Academic Exchange Service (DAAD). To obtain the data for the earlier years we proceeded as follows: The DAAD provided us with the number of scholarships allocated to each ERASMUS inter-university agreement (Inter-university Cooperation Program, ICP). We combined this information with published listings of all ICPs, which give details about the participating universities and the subjects covered for each inter-university agreement (see, for example, DAAD (1992)). This allows us to construct a panel data set at the university-subject-year level that covers the entire history of the ERASMUS program in Germany. We use the following approach to establish when the typical student goes abroad: We compute the median academic year in which students go abroad, separately by graduate cohort, subject and university type (University, University of Applied Science, Comprehensive University, Theological University or College of Art). We then assign to each student the exposure to the ERASMUS program in that academic year. This approach is preferable to simply assigning ERASMUS characteristics at a fixed point in the student's study period (say the first or second year): since our graduates are sampled when they exit university, and since there is substantial variation in length of studies, there might be a systematic relationship between individual study duration and other unobservable factors. All our regressions include fixed effects both for the graduate cohort and for the year in which the typical student studies abroad, which was used to assign the ERASMUS exposure.

We restrict our sample to those observations for which all variables of interest are observed. As mentioned before, students from the graduate cohorts 1989, 1993, and 1997 have been surveyed twice, the first time one year after graduating from university and a second time five years after graduation. We thus have two observations for the location of work for most individuals from those cohorts. In the estimation below, we pool the observations from the initial and the follow-up survey for efficiency reasons. This

[6] Using a linear years of parental education variable or controlling for mother's and father's education separately does not affect our results.

allows us to use the information provided in both questionnaires. Means and standard deviations of our estimation sample are reported in Table 1. It is evident from comparing columns (2) and (3) that individuals who studied abroad are also more likely to work abroad later in life. One can also see that individuals with more exposure to ERASMUS (as measured by ERASMUS ratio or ERASMUS indicator, which are described in further detail below) are more likely to study abroad. In the following section we explain how we use the ERASMUS program to identify the causal link between studying abroad and international labor market mobility later in life.

3 Identification Strategy

In order to investigate the effect of studying abroad on international labor market mobility we estimate the following equation.

$$\begin{aligned}(1)\ \text{Work Abroad} = \beta_1 + \beta_2 \text{Study Abroad} + \beta_3 \text{X} + \beta_4 \text{Cohort FE} + \beta_5 \text{Year Abroad FE} \\ + \beta_6 \text{Subject FE} + \beta_7 \text{University FE} + u\end{aligned}$$

Where *Work Abroad* and *Study Abroad* are dummy variables indicating whether an individual worked abroad or studied abroad, respectively. X is a vector of personal characteristics, which may affect the decision to work abroad, such as gender, work experience or an individual's family background. We also include a full set of dummies for each graduate cohort, the year a typical student goes abroad (as explained in the previous section), a student's subject, and university. Our main interest lies in obtaining consistent estimates of β_2.

The summary statistics presented in the previous section clearly indicate that students who study abroad differ systematically in their observable characteristics from those who remain in Germany throughout their undergraduate studies. Although our data set is rich in observed characteristics of the student, many dimensions which are likely to affect the students' mobility decision remain unobserved. A possible factor could be, for example, the students' unobserved motivation. If these unobserved factors are correlated with the outcome, estimating equation (1) using OLS would yield biased estimates, because we would mistakenly attribute the effect of the unobserved covariates to the stay abroad. While it is generally difficult to characterize these unobserved components in its entirety, there is some direct evidence of what factors may play a role. In their sociological analysis of determinants of studying abroad, Muessig-Trapp & Schnitzler (1997) identify as critical factors affecting the decision to study abroad the student's financial situation, whether she holds any part-time job, foreign language skills, the expected labor market benefit of going abroad, and her motivation and personality structure. Clearly, many of these dimensions will be unobserved to the econometrician.

Thinking about our outcome of interest it is likely that the same unobserved factors which drive the decision to study abroad will also affect the decision of where to look for a job. It is therefore not clear what at all can be learned from a comparison of means of those who study abroad versus those who do not. This underlines that this context requires a credible identification strategy to learn about the causal impact of the study period abroad. We use the ERASMUS program as an instrumental variable to identify the causal effect of studying abroad. As our first stage we estimate the following equation:

$$\begin{aligned}(2)\ \text{Study Abroad} = \ & \gamma_1 + \gamma_2 \text{ERASMUS} + \gamma_3 \text{X} + \gamma_4 \text{Cohort FE} + \gamma_5 \text{Year Abroad FE} \\ & + \gamma_6 \text{Subject FE} + \gamma_7 \text{University FE} + \epsilon\end{aligned}$$

ERASMUS is a variable measuring a student's exposure to the ERASMUS program, which we describe in further detail below. In addition to the main variables of interest we include the same control variables as in equation (1).

Our identification strategy relies on the large scale introduction and expansion of the ERASMUS program. In 1987, the Council of Ministers of the European Community passed the *European Community Action Scheme for the Mobility of University Students* (ERASMUS). The main objective of ERASMUS is "to achieve a significant increase in the number of students [...] spending an integrated period of study in another Member State" (Council of the European Communities 1987). Student mobility was to be increased through the creation of a European university network, individual scholarships, and mutual recognition of academic credits (Smith, Alan 1988). Since then, ERASMUS has continually expanded. Looking across all participating countries, 1.37 million students have taken part in ERASMUS in the period of the academic years 1987/88 to 2004/05, with 15.7% of those outgoings coming from Germany.[7] The magnitude of the expansion can be clarified by relating ERASMUS outgoing students to the number of students in a given cohort. For example, of those graduates surveyed in 2001, about 5% of German students studied abroad with an ERASMUS scholarship.[8] The overall incidence of studying abroad for the 2001 cohort is 8 percent. The ERASMUS program therefore accounts for more than half of international undergraduate mobility in Germany in our last cohort. Particularly noteworthy is the over-time change in the number of ERASMUS

[7] One argument why outmigration of skilled workers does not lead to brain drain is that there may be off-setting immigration from other countries. Statistics on the ERASMUS program indicate that within the ERASMUS student exchange, German outgoing students are not matched by corresponding incoming students from other countries: In 2004/05, German outgoing ERASMUS students exceed incoming ERASMUS students by about 30 percent.

[8] This number is obtained as follows: In the 2001 graduate cohort, the median student started her tertiary studies in the academic year 1995/96. In that year, about 262,000 students entered university. The typical exchange student in that cohort studied abroad in the third year of her studies. In that year 13785 students from German universities participated in the ERASMUS program. This corresponds to about 5% of the entire cohort.

scholarships. Figure 3 shows the number of German outgoing students for each year since the introduction of the program.

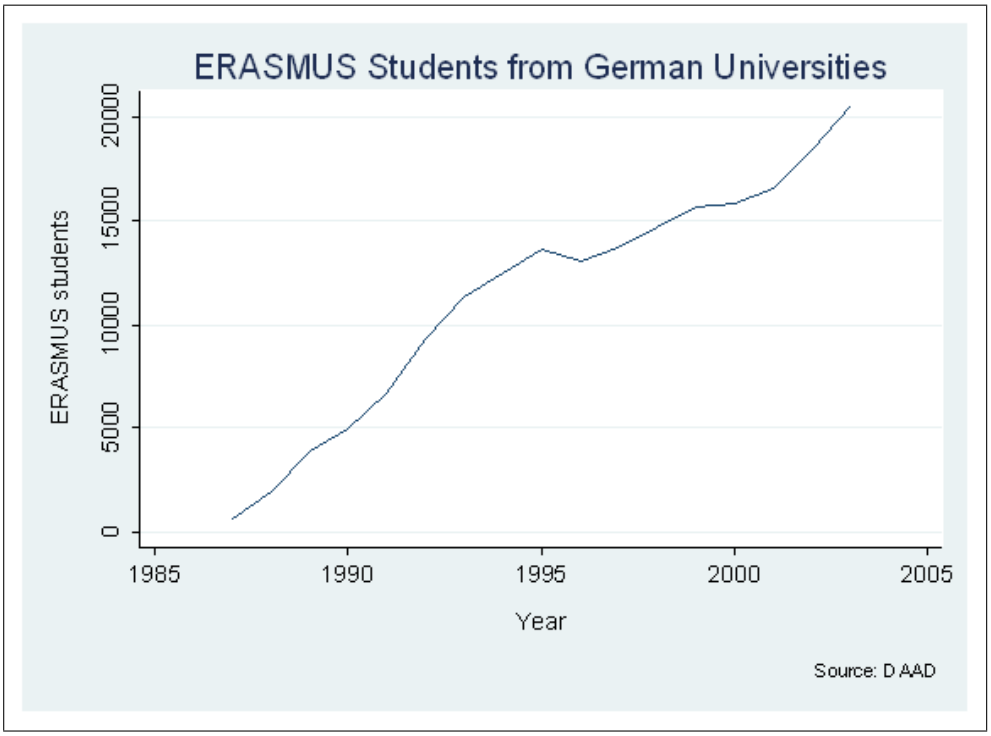

Figure 3: ERASMUS in Germany

The dramatic expansion is clearly visible. Students in our four graduate cohorts are therefore affected quite differently by the program. It is important to be precise about the variation we exploit to identify the effect of ERASMUS. We account for systematic differences between universities by including university fixed effects. Our empirical strategy thus relies on over-time changes in scholarship availability. At the same time, we include dummies for our four graduate cohorts, so that any difference that is common to all students in a cohort is taken out as well. This ensures that we are not relying on any long-term trends (which may possibly affect both the instrument and the outcome). Furthermore, we include dummies for the year a typical exchange student begins her stay at a foreign university. We define this year as the year when the median exchange student in a given subject and graduate cohort enrols at a foreign university. We allow this year to vary across different subjects because students in different departments integrate their stay at a foreign university at different times of their degree. We also allow this timing to vary across different university types. In addition to that we include subject fixed effects in our estimation. This accounts for any systematic difference in international mobility of students in different subjects. We therefore rely on over-time changes in program intensity at a given subject and university combination. Probing the robustness of our findings we also include subject specific time trends in our specifica-

tions. These allow for a separate linear trend in the probability of studying abroad for each subject. The nature of our results is not affected by including those time trends. In another robustness check we further control for possible unobserved heterogeneity by including fixed effects for the interaction of a student's faculty (such as humanities or science faculty) and her university. We show below that our findings are robust to using these fixed effects.

Students participating in the ERASMUS program apply for an exchange scholarship at their home university. The award of the scholarship not only secures them a place at a certain partner university abroad but also provides them with a small mobility grant. In the academic year 1997/1998 (the year a typical student from the 2001 graduation cohort went abroad) an outgoing student from Germany received about 138 Euros per month for her stay abroad. In addition to receiving the mobility grant the ERASMUS student receives a tuition fee waiver at the foreign university. Another important benefit of ERASMUS is that it significantly reduces the student's application costs and the time the student needs to apply in advance to be able to organize a stay at a foreign university.

In order give a insight into the variation, which is exploited in our identification strategy, we show the raw data on the number of ERASMUS students at four departments at the two large universities in Munich in the following figure.[9]

[9] We choose the Ludwig-Maximilians University and the Technical University Munich for our descriptive analyis because they are located in the same city and are of similar quality and reputation. This is exemplified by the fact that these two unversities were among only three universities to be selected as winner of the "Initiative for Excellence". This initiative allocates federal funding to German universities which are considered to have the potential to become world-class research universities. This potential was evaluated based on the universities' past performance and on their strategic plans for the future.

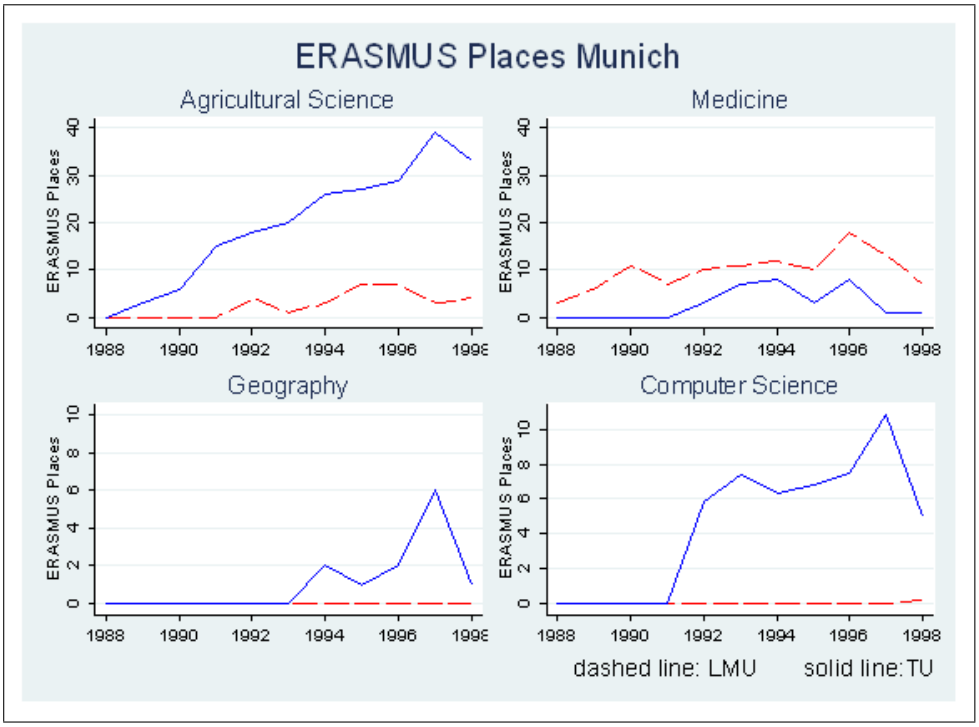

Figure 4: ERASMUS at Universities in Munich

The introduction of the ERASMUS program at a certain department occurred at different points in time at the two universities. After the introduction of the program the number of students going abroad varies over time. We construct two different measures of a student's exposure to the ERASMUS program. The first variable measures the exact number of ERASMUS scholarships, offered by each department at every university in a given year. In order to account for differences in size of different departments, we normalize the number of scholarships with the number of students competing for these scholarships. We use the number of first year students in the fall semester of the academic year 1992/93 for this normalization. Again, these student numbers are at the university-subject level. In the following we refer to this variable as *ERASMUS ratio*. This measure for a student's exposure to the scholarship program varies at the university, subject, year level.

The second ERASMUS measure is an indicator, which takes the value one if the student's department offered an ERASMUS scholarship in the relevant year. In almost all cases this variable is 0 until a certain department joins the ERASMUS program and 1 thereafter, because very few departments leave the program after they have joined. We denote this variable *ERASMUS indicator,* which varies in the dimensions university, subject, and year as well. On the one hand this variable is less powerful than the other measure because it does not capture changes in the number of ERASMUS scholarships provided, which certainly affect a student's probability of studying abroad. On the other hand, however, this disadvantage may be an advantage if student demand affects

the number of ERASMUS places. This would affect the credibility of any instrument using the actual number of ERASMUS scholarships. Even though we believe that this is not an important concern in practice we propose our ERASMUS indicator variable as an alternative, which deals with this concern. The ERASMUS indicator variable is 0 if a department does not offer any ERASMUS scholarships and 1 if any ERASMUS scholarship is offered. Using the ERASMUS indicator as an instrument amounts to a classical difference-in-differences estimator comparing students before and after the introduction of an exchange program for their subject at their university. The only way in which student demand may affect this instrument is through triggering the introduction of ERASMUS in the relevant department, which we believe is extremely unlikely. Administrative hurdles when setting up the program stand in the way of any short term responses to student demand. If a certain department wants to join the ERASMUS program, the university has to apply for a certification at the European Commission. Moreover, the department has to find partner universities, which are willing to exchange students with the given department. Clearing these administrative hurdles takes time. It is therefore very unlikely that departments are able to set up a new ERASMUS program in time for a certain cohort to be able to benefit from that introduction.

Where does the over-time variation in ERASMUS come from? University participation in ERASMUS operated through Inter-University Cooperation Programs (ICP), in which groups of university departments from different countries formed a network covered by an ICP agreement, typically initiated through an active professor who happens to have contacts with professors at foreign universities. Departments enter the program at different times, and this provides us with a lot of variation in program participation. One way to interpret the evolution in ERASMUS scholarships is to think of the cooperations as an emerging network. Many departments would at some point enter ERASMUS with a few links to departments at foreign universities. Over time other foreign departments would be taken into the network. Similarly the German department itself would enter other (possibly new) cooperation networks.

In order to visualize how students are affected by these shocks of being faced with more or less exchange opportunity, we perform the following event study: For each student's initial university and subject choice, we observe whether there was at any point an ERASMUS cooperation in the time period we observe. We group students by whether they entered the university before or after the introduction of the ERASMUS scheme, and by how many years. In the following figure we plot the time difference between the introduction of ERASMUS and university entry against the probability of going abroad. Keeping in mind that students usually start two or three years before going abroad, we get the following prediction: According to our hypothesis, the probability of studying abroad should be flat for the cohorts starting more than three years before the introduction. The cohorts starting three or two years before the introduction of

ERASMUS would then be the first ones to be affected, and we expect an increase in the proportion of students studying abroad from then on. The results can be seen in Figure 5.

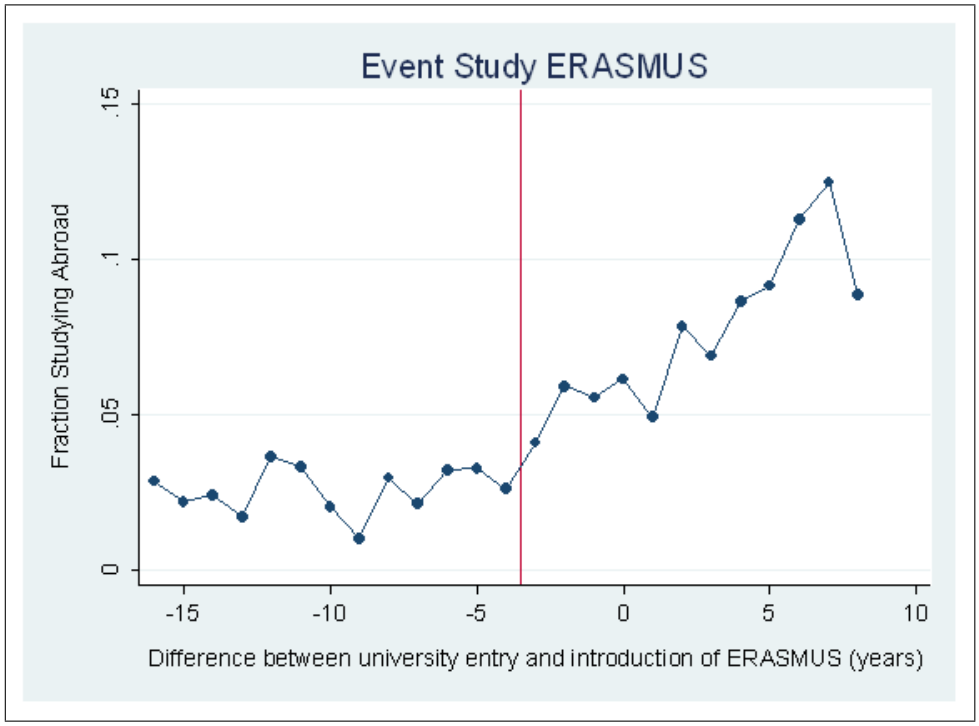

Figure 5: Event Study ERASMUS

This figure provides evidence that the ERASMUS scheme affects the different cohorts in a very precise way. Closely following our prediction, the probability of studying abroad is low and flat before the introduction of ERASMUS, and goes up steeply afterwards. Furthermore, our data provides evidence that institutions which have *not yet* introduced ERASMUS are similar to those which *never* introduce ERASMUS: Students at institutions which never introduce ERASMUS have a probability of studying abroad of 2.6%, which closely matches the average for the not-yet-affected students in the graph above.

The usefulness of ERASMUS as an Instrumental Variable (IV) depends on two conditions: First, the IV needs to be correlated with the endogenous variable (studying abroad). Second, it needs to be uncorrelated with the error term u of the outcome equation. The rank condition can be verified by looking at the first stage regression, which we present in the following section of the paper.

The exclusion restriction requires that there is no direct effect of the instrument on the outcome except through the endogenous variable. Since ERASMUS scholarships are restricted to educational exchange for undergraduate students, this is arguably satisfied. Furthermore, it is required that our IV is not correlated with any other variable which affects the outcome. We argue that this is satisfied through our empirical strategy. We

address possible concerns in turn. In particular, we consider the '*university quality*' argument, the '*big push*' argument, and the '*student selection*' argument.

One concern may be that university quality affects both scholarship availability and the outcome: If good universities offered more ERASMUS scholarships, and if at the same time good universities produced higher skilled graduates who are more likely to find a job in a different country, the exclusion restriction would be violated. A similar argument applies if students at good universities were particularly motivated and able, making them more mobile even in the absence of ERASMUS. We take care of this problem by including university fixed effects (FE) in all our regressions, which control for any permanent university attribute. A closely related criticism is that even within a given university some faculties, such as sciences, may be better than other faculties. We show that our results also hold if we include faculty times university fixed effects, which control for any permanent difference between faculties even within a given university.

A common concern in IV estimation is that using a particular policy may carry the risk of not accounting for other policies which were implemented at the same time. Consider a university which at some point decides to raise its profile, and implements a number of measures designed to increase the attractiveness of the institution. For example, it could engage in more active exchange activities also outside Europe and possibly implement other measures at the same time. One way to demonstrate that this is unlikely to be the case is by showing that the ERASMUS program had a very precise and narrow impact. We use information of where students went to study abroad, grouped into three categories (Europe, United States, and other areas). We show below that the ERASMUS program only affected the exchange to Europe but not to other areas. This provides additional reassurance that our instrument has a very precise effect, only affecting a student's probability to study abroad in Europe.

Another concern is that students may choose a particular university-subject combination because of scholarship availability. Particularly mobile students might choose universities and departments offering a large number of ERASMUS scholarships. This would again bias our IV results. We do not think that this is likely to occur, however. Since most of our sampled individuals started their university career long before the widespread availability of the internet, information about exchange programs was extremely difficult to obtain. Even nowadays it is hard to obtain information on the availability of ERASMUS scholarships on departmental websites of German universities. It is much more likely that enrollment decisions are based on factors such as reputation of the university or closeness to home. We also address the student selection argument directly by controlling for distance between the state of a student's highschool degree and her university. Controlling for earlier mobility does not affect our results. A related worry is that students may change university or department after they figured out that their university and/or department offers little opportunity to study abroad. Using the

ERASMUS measures from a student's *first* enrollment enables us to avoid any problems of selective mobility after university entry of the student.

In summary, we believe that in our empirical framework ERASMUS scholarship availability provides us with exogenous variation in the student's decision to study abroad. After controlling for university FE, subject FE, graduate cohort FE, and year abroad FE we argue that the remaining variation can be understood as random shocks to the student. Depending on the cohort, subject, and university she belongs to, she will find a different set of international cooperations at her disposal. These differences in scholarship availability will then translate into variation in the decision to study abroad. Using ERASMUS as an instrumental variable we can therefore estimate equations (1) and (2) to find the causal effect of studying abroad. In all the regressions reported below we account for any dependence between observations by clustering all results on a university-subject level. This leaves the error correlation within clusters completely unrestricted and allows for arbitrary with-in cluster dependence. The clustering, therefore, not only allows arbitrary correlations of errors for students from a graduate cohort at a certain university and subject combination but also allows the errors of a university-subject combination to be serially correlated. The following sections discuss the results we obtain using our identification strategy.

4 First Stage Results

Table 2 presents the results from our first stage estimates. In this context the first stage regressions are interesting in its own right as one can learn about the factors affecting an individual's decision to study abroad. We regress an indicator for studying abroad on our measure for exposure to the ERASMUS program and other control variables. In column (1) we use the ratio of ERASMUS places to the number of students in the relevant cohort as our measure for a student's exposure to ERASMUS. The coefficient on ERASMUS is highly significant with an F-statistic of 17.4. The coefficient indicates that an increase in the ratio of ERASMUS places from say 5 percent to 10 percent increases an individual's probability of studying abroad by about 1 percentage point. Analyzing the effect of our control variables one can see that a student's gender does not seem to affect her probability of studying abroad. Students who have completed an apprenticeship before enrolling at the university are about 1.3 percentage points less likely to study abroad during their undergraduate studies.

In column (2) we use an indicator for whether the student's department participates in the ERASMUS program as our measure for exposure to the ERASMUS program. Once again the coefficient on the ERASMUS measure is highly significant with an F-statistic of 9.1. The coefficient indicates that a student's probability of studying abroad increases by about 1.4 percentage points if her department participates in the ERASMUS

program. The coefficients for the control variables are very similar to the ones reported in column (1).

In columns (3) and (4) we add controls for a student's parental background to our specifications. Parental occupation is measured in five categories for each parent. We include a full set of dummies for these categories in these specification. To save space we do not report the coefficients on all those dummies.[10] Parental education is measured in three categories as the education level achieved by the parent with more education. The results indicate that students with better educated parents are significantly more likely to study abroad. Students with a parent whose education level falls in our second category are about 1 percentage point more likely to study abroad than students with parents who have at most 13 years of education. Students with a parent holding a university degree are about 3.4 percentage points more likely to study abroad. The coefficients and standard errors of our ERASMUS measures are hardly affected by including the controls for parental background. This is reassuring as it indicates that explicitly accounting for socioeconomic background does not alter the power of our intervention on students' behavior.

The specifications reported in columns (5) and (6) include controls for a student's mobility at the beginning of her studies. The first mobility measure is an indicator for whether the student has her first university enrolment in the federal state *(Bundesland)* where she graduated from high school. We add a further control, which measures the distance from the state where a student obtained her high school degree to the state of her first university enrollment. The results indicate that students who study in the state of their final high school degree are about 1.4 percentage points less likely to study abroad. Even though the coefficient on the distance measure for pre-university mobility has the expected positive sign (those who enrol at a university further away from the state where they obtained their high school degree are more likely to study abroad), this variable is not significantly different from 0. The estimates for the effect of the ERASMUS program are not affected by including the controls for early mobility.

In the following we show that the ERASMUS program has a very specific effect on studying abroad, as it only affects the probability of studying abroad in a European country but not in countries outside Europe. This is a clear indication that the introduction of ERASMUS was not one of many policies to improve university quality, which in turn could affect the outcome as well. In order to demonstrate the precise effect of studying abroad we create three indicator variables, which take the value 1 if an individual studied abroad in Europe, the USA, or in any other foreign country respectively. We expect that our instrument only affects the probability of studying abroad in Europe as the ERASMUS program only offers scholarships for studying abroad in European part-

[10] More detailed results with reported coefficients for the occupational dummies are available from the authors upon request.

ner universities. In columns (1) and (2) of Table 3 we replace the dependent variable of our usual first stage regression (studying abroad in any country) with an indicator for studying abroad *in Europe* instead. The specification reported in column (1) is estimated using the ratio of ERASMUS scholarships. In column (2) we present the results from using the ERASMUS dummy as our measure for exposure to the program. The coefficients on the ERASMUS measures are strong and highly significant. The magnitude of the ERASMUS coefficient is similar to the one obtained when we use the general definition of studying abroad.

We use an indicator for studying abroad in the US as our dependent variable for the specifications reported in columns (3) and (4). The coefficient on the ERASMUS measures is not significantly different from 0. Furthermore, the point estimates of the ERASMUS measures are very close to 0. In columns (5) and (6) we report specifications where we use an indicator for studying abroad in any country outside Europe or the US as the dependent variable. The results indicate that the ERASMUS program has no effect on the probability of studying abroad in countries outside Europe or the US. The evidence from Table 3 strongly suggests that the introduction of the ERASMUS program was not correlated with the introduction of a broader set of policies, which might themselves affect later labor market outcomes. These results increase our confidence for using the ERASMUS program as an instrumental variable for studying abroad. In the following section we use this IV to obtain estimates of the effect of studying abroad on the probability of working in a foreign country later in life.

5 Main Results and Sensitivity Analysis

The OLS results reported in column (1) of Table 4 confirm that graduates who spent some time at a foreign university are more likely to work abroad later in life. Our OLS result indicates that the effect of studying abroad is about 6 percentage points. Note that as before, all our standard errors are clustered at the university-subject level. As discussed before we do not want to attribute causality to the OLS results. This is because the factors affecting an individual's decision to study abroad are likely to affect her decision to work abroad later on as well. Therefore, we now turn to our IV results.

In column (2) of Table 4 we present the first set of IV results using the ratio of ERASMUS scholarships to the total number of students in the department as an instrument. We find that studying abroad increases an individual's probability to work in a foreign country by about 24 percentage points. Given the relatively large standard error this effect is significant at the ten percent level. We also find that females are about 0.6 percentage points more likely to work abroad. Furthermore, we find that individuals

who completed an apprenticeship before they enrolled at university are about 0.4 percentage points less likely to work abroad, although this effect is not significant. People who complete an apprenticeship may be more likely to go back to work at the same firm where they completed their apprenticeship, which will usually be located in Germany. We also find that labor market experience has an effect on the probability of working abroad. The coefficient indicate that individuals with one more year of experience in the labor market are about 0.5 percentage points more likely to work abroad. Within a survey wave, there is relatively little variation in potential experience, and this estimate also captures the increased probability of working abroad from the initial to the follow-up survey. Over and above this annual measure of potential experience, the indicator variable for the follow-up survey does not show up significantly.

Column (3) adds interactions of the ERASMUS ratio with a full set of subject dummies as instruments. Including these interactions allows the impact of ERASMUS to differ across subjects. This may be relevant as it is quite likely that a student exchange program has a different impact for students studying different subjects. Since all our specifications include subject fixed effects, identification does not exploit any permanent differences between subjects. Instead, this specification allows the effect of the ERASMUS to vary by subject in the first stage. Including the interactions strongly increases the precision of our estimates. The coefficient on studying abroad is significant at the 5 percent level and indicates that studying abroad increases an individual's probability of working abroad later in life by about 14 percentage points. The coefficients on the control variables are very similar to the ones reported in column (2).

Even though we do not believe that student demand has a large impact on the number of ERASMUS scholarships we address this concern by using the *ERASMUS indicator* as our instrument in the specifications reported in columns (4) and (5). In column (4) we present the results from using the ERASMUS indicator as the only instrument. The standard errors on the coefficient for studying abroad increases a lot, because the dummy for offering any ERASMUS scholarships is a much less precise measure of a student's exposure to exchange opportunities. The point estimate, however, is very similar to the one we obtain if we use the *ERASMUS ratio* instrument.

In column (5) we show that using the interactions of the ERASMUS indicator with a full set of subject dummies increases the precision of our estimates. The estimated coefficient on studying abroad indicates that studying abroad increases an individual's probability of studying abroad by about 19 percentage points. As before, the coefficients on the other variables are hardly affected by using the indicator measure instead of the ratio measure of ERASMUS. Even though we lose some precision by using the ERASMUS indicator as our instrument the results are very similar to ones obtained if we use the ERASMUS ratio. Given these results we are confident to say that our results reflect a supply-side increase in scholarship availability, rather than students' demand. – One

common concern in IV estimation is a potential bias due to weak instruments (see Bound, Jaeger & Baker (1995) and Stock, Wright and Yogo (2002)). The F-statistic from the first stage, reported at the bottom of Table 4, show that for most of our estimates, weak instruments are not likely to pose a problem even using conservative cut-off values for the F-statistic. In the ERASMUS indicator specification with subject interactions (column (5)), the F-statistic is comparatively lower, but the coefficient is very similar to the previous ones, suggesting that weak instrument bias is not likely to be a problem here.

In summary, our IV results indicate that studying abroad increases the probability of working abroad by around 15 to 20 percentage points. In the following, we show that our results are robust to a number of specification checks.

There may be a worry that students from different family backgrounds not only choose universities with different provision of ERASMUS scholarships but also exhibit different propensities to work in a foreign country. As long as this effect is constant over time we deal with this problem by estimating all equations including university fixed effects. It could be possible, however, that people from different backgrounds react differently to the introduction of an ERASMUS program or changes in the number of scholarships. In order to address this concern we add controls for parental education and occupation to our main specification. It is evident from looking at Table 5 that including the measures for parental background hardly affects our estimates of the effect of studying abroad. The results indicate that students from better educated parents are between 0.5 and 1 percentage points more likely to work abroad, although this effect is not always significant.

Another concern is that students with a taste for mobility chose universities or departments with a lot of ERASMUS scholarships. Our IV estimates would be biased if these individuals were more likely to work abroad later in life. In the following we present a powerful test, which directly addresses this concern. We add two variables which control for a student's mobility at the start of her university career. The first variable indicates whether the student enrols in university in the state *(Bundesland)* where she obtained her highschool diploma *(Abitur)*. The second mobility variable measures the distance from the state where she obtained her highschool diploma to the state of her first university enrolment. Including those two mobility variables hardly affects the estimates for the effect of studying abroad as can be seen from looking at Table 6. The coefficient on the distance measure for early mobility indicates that individuals who chose to study further away from the state where they received their highschool diploma are more likely to work abroad later in life. At the same time, the results from Table 6 indicate that the effect of studying abroad remains unchanged.

Individuals may be more likely to work abroad if they know more foreigners. There are at least two channels through which the number of contacts to foreigners may affect

the likelihood of working abroad. One channel may be an increased number of contacts to future business partners. A further channel may be that contacts to foreigners increase an individual's taste for foreign cultures which may affect her probability of working abroad. As the ERASMUS program is at least partly reciprocal, universities offering more ERASMUS scholarships may also enroll more foreign students. This could then increase the student's propensity to work abroad later on and therefore bias our IV results. In Table 7 we present the results from adding the university wide ratio of foreign students over the total number of students in a student's cohort[11] to our specification. Adding this control does not change the coefficient on studying abroad at all. The coefficient on our measure for the exposure to foreign students is highly significant but rather small in magnitude. The estimated coefficient indicates that increasing the percentage of foreign students at a student's home university from say 5 to 15 percent increases her probability of working abroad by about 0.08 percentage points. This exercise is interesting also because it adds university-specific covariates which vary over time, and it is reassuring that the results remain unchanged.

In the following we check whether our results are driven by time trends in our variables of interest. Including graduate cohort FE (as in all specifications) guarantees that we do not identify the effect of studying abroad on working abroad from overall time trends. There may be a worry, however, that students studying certain subjects exhibit time trends in both studying abroad and working abroad. To address this issue we include linear subject specific time trends. The results of this exercise are reported in the second panel of Table 8. Apart from the specification reported in column (3) the inclusion of the subject specific time trends hardly affects the coefficient of studying abroad.

It may be the case that groups of departments within a university differ in quality or in their ability to foster international exchange. We address this concern by including a full set of department group times university fixed effects. We thus use a separate fixed effects for say sciences or languages at a certain university. Including this fine level of FEs hardly affects the estimates using the ERASMUS ratio instrument. Not surprisingly the estimates using the ERASMUS indicator instrument are slightly more affected. The order of magnitude of the estimate, however, is preserved.

It is reassuring that the inclusion of time trends or a finer set of fixed effects does not have a huge impact on our estimates. This and the fact that our estimates are hardly affected by including controls for parental background, for early mobility, and for the number of foreign students at the home university makes us confident that using the ERASMUS program as a source of exogenous variation is a credible identification strategy to estimate the causal effect of studying abroad on later labor market mobility.

One defining feature of our results is that the IV results are substantially higher than

[11] We use the ratio at the middle of the average student's university career as the relevant measure for contacts to foreigners.

the corresponding OLS result. We interpret this finding in terms of heterogeneity in returns: It is unlikely that all students will be affected in the same way by the intervention of studying abroad. It is much more likely that the effect of studying abroad itself varies across the student population. We follow Imbens & Angrist (1994) and interpret our estimates as a Local Average Treatment Effect (LATE): The IV results show the average effect for the subgroup which has been affected by the instrument. In the context of our instrument, this group is well-defined: It is the group of students who would not have studied abroad without the ERASMUS program, but study abroad when the ERASMUS is implemented. Since they are the students who have been affected by the ERASMUS program, our estimates are of immediate interest to policy makers.

What are the characteristics of these switchers? In the absence of credit constraints, this will be the group of students for whom the cost of studying abroad is slightly above the returns without ERASMUS. The introduction of ERASMUS can be understood as a price change which makes the investment into studying abroad worthwhile for these marginal students. In the presence of credit constraints, some students will not be able to invest in studying abroad even though this investment offers a positive return. These students are prevented from realizing the returns to studying abroad by being credit constrained. The following analysis suggests that credit constraints are likely to play a role. We follow Kling (2001) in interpreting the IV estimate as a weighted average of the causal effect of studying abroad, where the weight of each subgroup j is given by the following formula:

$$(3) \qquad weight_j = \frac{w_j \lambda_j \Delta(StudyAbroad)_j}{\sum_j w_j \lambda_j \Delta(StudyAbroad)_j}$$

Here w_j is the sample fraction of each subgroup j, λ_j is the variance of the instrumental variable for subgroup j conditional on all other regressors x, and $\Delta(StudyAbroad)_j$ is the impact of the ERASMUS instrument on the probability of studying abroad for subgroup j. The last term is obtained from estimating the first stage regression separately for each subgroup.[12] We use this decomposition to compute the corresponding weight for two subgroups: students who are credit contrained and a subgroup which is unlikely to be credit contrained. We proxy credit constraints with an indicator variable which takes the value 1 if the student ever received any federal financial assistance in the BAFOEG scheme during the course of study. In our sample, this is about 41% of all observations (see column (1) in Table 9). Here, we use the ERASMUS indicator variable as instrument. Not surprisingly, the overall proportion of students who study abroad is smaller for the credit-constrained group than for the non-credit constrained group, reflecting differences in investment behavior between these two groups. Interestingly, column (2) indicates that the first stage is stronger for credit constrained students: They react more strongly to the introduction of ERASMUS. This seems sensible as it

[12] See Kling (2001) for further details.

indicates that credit-constrained students rely more heavily on the ERASMUS program. Exposure to ERASMUS as measured by the conditional variance λ is similar between the groups (column (3)). Computing the resulting weights, column (4) states that the IV estimate places a weight of 54% on the group of the credit constrained students, which make up only 41% of the sample. This underlines that credit constrained students contribute disproportionately to our IV estimates of the effect of studying abroad.

6 How Studying Abroad Affects International Labor Market Mobility

The results presented in the previous sections indicate that individuals who study abroad are more likely to work in a foreign country. It is interesting to understand how studying abroad affects an individual's decision to migrate to a foreign country later in life. We address this in two ways: First, we make use of observed location choices to study the type of skills acquired during the stay abroad. Second, the survey provides us with direct qualitative evidence on why graduates move abroad, and we show how this varies depending on whether the student studied abroad earlier. As these qualitative questions were only administered to one cohort we cannot apply our instrumental variable strategy here. We therefore provide a descriptive analysis, which – if only suggestive – may shed light on the way studying abroad affects later labor market mobility.

We can think of the effect of studying abroad as affecting the set of skills the student acquires during her studies. One important question is whether these skills have a strong location-specific component. We can shed some light on this question by investigating whether individuals who have studied abroad return to work in the same country when they decide to work in a foreign country. There are a number of reasons why mobile graduates may be more likely to work abroad in the countries where they studied abroad before: During their study period abroad they may have obtained skills that are of particular relevance in that labor market, e.g. language skills, knowledge about the local labor market, or personal contacts which facilitate a match. On the other hand, it is possible that studying abroad affects the probability of working abroad equally for different work destinations. This would be the case, for example, if studying abroad widens the horizon of the student generally and leads her to search for a job internationally, independent of where she studied before. Especially, studying abroad could operate as a stepping stone to increase the set of feasible destinations. This question is also highly relevant from a policy perspective: The ability of the ERASMUS scheme or other student mobility programs to achieve an integrated European labor market depends on the assumption that students who went abroad to study in Europe are internationally mobile after graduation, but remain in Europe.

Here we present descriptive evidence to address this question for the cohorts 1993, 1997, and 2001.[13] We again group location choices into Europe, US, and other areas, and restrict attention to students who work abroad. For each study abroad treatment and study abroad location, Table 10 shows the conditional probability of being in each work location. Table 10 provides evidence that choices about study abroad locations are sticky, that is that students tend to return to work to the region where they studied abroad. In particular, of the students who studied abroad in Europe and worked internationally after graduation, two thirds end up working in a European country. A χ^2-test of independence between the study abroad location and the work abroad location is rejected at the one percent level with a test statistic of 28.5.

We now turn to qualitative evidence from the survey on why graduates moved abroad. The HIS questionnaire asked individuals who had already worked abroad to give reasons for why they had chosen to do so. Unfortunately, this question was only administered to individuals from the 1997 graduation cohort.

Students who had worked in a foreign country for at least one month in the five years since graduation were asked to identify the reasons for their decision to work abroad. In Table 11 we present the percentage of the people who indicated that a certain reason had been important in their decision to work abroad. The table shows that the main reasons for working abroad are interest in foreign cultures, interesting offers from abroad, and the initiative of the employer. We split the sample into those who complete all their university education in Germany and those who study abroad for some time during their undergraduate education. Interestingly, while the means are similar in some categories, there are a number of noteworthy differences. Those who have studied abroad are more likely to indicate that their interest in foreign cultures has led them to seek employment abroad. It may be the case that studying in a foreign country increased the individual's taste for living abroad, which may in turn increase her probability of migrating later in life. Students who have studied abroad are also significantly more likely to indicate that they chose to work abroad to be with their partner. The answers to this question may suggest that people who studied abroad may have met their partner while studying abroad and therefore consider to work abroad later in life. Of course, this difference may also be driven by assortative mating with more mobile people having more mobile partners, and the way this question was asked makes it impossible to distinguish between these alternatives. Meeting a partner abroad may, nonetheless, be a possible channel of the effect of studying abroad. The summary statistics also indicate that those who have studied abroad are somewhat more likely to say that they work abroad because of better employment opportunities in the foreign labor market, where we obtain a p-value of 0.06 when we test for a significant difference in the means of the two groups for this response. It is possible that a stay at a foreign university makes it easier to realize opportunities in

[13] For the cohort 1989, we do not have information on locations of study abroad.

foreign labor markets, either because those who studied abroad have better information on the foreign labor market or because employers are more willing to offer employment to those individuals. Interestingly, rather than the employment outlook, it is the career prospects abroad where the means are significantly different at the 1% level, suggesting that those with international study experience seem to be more likely to consider a career abroad.

The statistics presented here provide some suggestive evidence of how studying abroad may alter later international labor market mobility. Further research is necessary to get a better insight into the channels of the effect of studying abroad on working abroad later on.

7 Conclusion

Using exogenous variation in scholarship availability, we are able to identify a causal effect of undergraduate student mobility on later international labor migration. Our strategy exploits the introduction and expansion of the ERASMUS scholarship program. The extent to which students were exposed to the scholarship scheme varied widely. We exploit cross-sectional and over time-changes in scholarship availability. Accounting for permanent differences between different institutions, different subjects, and different graduate cohorts, our identification relies only on differential over-time change, and can be interpreted as a Diff-in-Diff estimator. Our first-stage shows that the ERASMUS scheme has indeeed a strong effect on the students' decision to go abroad, which is not surprising given its scale. We show that the instrument is precise in that it only affects the decision to study in Europe, but not in other locations. Our event study adds further credibility to our instrument, by showing that the probability of studying abroad is low and flat before ERASMUS is introduced, and increases strongly for those students affected by the scholarship.

Our OLS results indicate that the group of students who studied abroad are about 6 percentage points more likely to work abroad later on, controlling for a set of background characteristics, institution and time fixed effects. Our IV results are substantially higher than that, and indicate that the effect of study abroad is between 15 and 20 percentage points. We also provide results which interact the instrument with the students' degree subject. That allows for a differential effect of ERASMUS in different subjects, and adds precision to the results. We interpret the difference between OLS and IV as an indication of heterogeneity in effects: The population which is affected by our instruments reacts particularly strongly to the incentives of the mobility program. This Local Average Treatment Effect (LATE) interpretation is of particular interest to policy makers, since it evaluates the effect for the affected subgroup. We show that individuals who are credit

constrained are particularly affected by the ERASMUS instrument, and suggest channels through which the effect of studying abroad may operate.

Our results suggest that educational mobility programs may have a potentially large role in affecting students' behavior in their labor market mobility decision. It implies that an opportunity to attract talented graduates is to provide student exchange opportunities. Attractive universities and scholarship programs may yield a return through attracting students, part of whom will remain as skilled workers later on. In the context of the policy change under consideration, ERASMUS is successful in that this student mobility scheme appears to contribute to the development of an integrated European labor market. This is especially so if we take into account the descriptive evidence from the previous section that location choices are sticky, i.e. that mobile students tend to return to the region where they studied before.

More generally, our work allows insights into the dynamic implications of educational mobility decisions. Our results indicate that the effects of educational mobility programs go far beyond affecting the decision to study abroad for some time period, but rather reach far into the labor market, and it will be interesting to follow the sample of graduates as their careers unfold. But already at this early stage our results indicate that even short-term mobility investments can lead to significant further mobility investments later on.

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8 Tables

Table 1: Summary Statistics

	(1) All	(2) Study Abroad=0	(3) Study Abroad=1	(4) Work Abroad=0	(5) Work Abroad=1
Working abroad	0.035	0.031	0.107	0.000	1.000
	(0.184)	(0.175)	(0.309)	(0.000)	(0.000)
Undergraduate study abroad	0.045	0.000	1.000	0.042	0.138
	(0.207)	(0.000)	(0.000)	(0.120)	(0.345)
ERASMUS ratio	0.024	0.023	0.047	0.024	0.039
	(0.055)	(0.054)	(0.072)	(0.055)	(0.063)
ERASMUS indicator	0.436	0.425	0.662	0.429	0.622
	(0.496)	(0.494)	(0.473)	(0.495)	(0.485)
Female	0.421	0.419	0.463	0.419	0.496
	(0.494)	(0.493)	(0.499)	(0.493)	(0.500)
Experience	2.824	2.830	2.696	2.817	3.015
	(2.030)	(2.030)	(2.021)	(2.028)	(2.093)
Apprenticeship	0.309	0.315	0.183	0.312	0.234
	(0.462)	(0.465)	(0.387)	(0.463)	(0.424)
Mother's Education (years)	11.825	11.741	13.609	11.775	13.222
	(3.306)	(3.275)	(3.453)	(3.295)	(3.290)
Father's Education (years)	13.331	13.247	15.120	13.28	14.736
	(3.644)	(3.637)	(3.332)	(3.649)	(3.216)
Final University Grade[1]	2.068	2.078	1.859	2.074	1.906
	(0.685)	(0.627)	(0.660)	(0.686)	(0.644)
Bafoeg indicator[2]	0.414	0.418	0.346	0.417	0.355
(Financial Assistance)	(0.493)	(0.493)	(0.476)	(0.493)	(0.479)
Observations	38527	36798	1729	37182	1345

[1]The final university degree is only available for 37644 students in our sample. (The best grade is 1.0 the worst 4.0) [2]The question on financial assistance has only been administered since 1993. We have information on Bafoeg for 24405 individuals in our sample.
Note: This table contains sample means and (in brackets) standard deviations.

Table 2: First Stages

Dependent Variable: Indicator for Study Abroad

	(1)	(2)	(3)	(4)	(5)	(6)
ERASMUS Ratio	0.1866		0.1847		0.1819	
	(0.0447)***		(0.0442)***		(0.0440)***	
ERASMUS Indicator		0.0136		0.0134		0.0135
		(0.0045)***		(0.0045)***		(0.0045)***
Female	-0.0027	-0.0027	-0.0041	-0.0042	-0.0040	-0.0041
	(0.0033)	(0.0033)	(0.0033)	(0.0033)	(0.0033)	(0.0033)
Apprenticeship	-0.0131	-0.0130	-0.0086	-0.0084	-0.0089	-0.0088
	(0.0031)***	(0.0031)***	(0.0030)***	(0.0030)***	(0.0030)***	(0.0030)***
Experience	-0.0019	-0.0020	-0.0019	-0.0019	-0.0019	-0.0020
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)
Parental Education Dummy 2			0.0101	0.0102	0.0096	0.0097
			(0.0036)***	(0.0036)***	(0.0035)***	(0.0035)***
Parental Education Dummy 3			0.0339	0.0338	0.0327	0.0326
			(0.0043)***	(0.0043)***	(0.0043)***	(0.0043)***
Studying in State of Highschool Degree					-0.0136	-0.0137
					(0.0067)**	(0.0067)**
Distance to High School State (100km)					0.0018	0.0018
					(0.0018)	(0.0017)
Follow-up Survey (Dummy)	0.0076	0.0078	0.0073	0.0076	0.0074	0.0077
	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0054)
Parental Occupation Dummies			YES	YES	YES	YES
Graduate Cohort FE	YES	YES	YES	YES	YES	YES
Year Abroad FE	YES	YES	YES	YES	YES	YES
Subject FE	YES	YES	YES	YES	YES	YES
University FE	YES	YES	YES	YES	YES	YES
Instruments:						
ERASMUS	Ratio	Indicator	Ratio	Indicator	Ratio	Indicator
N	38527	38527	38527	38527	38527	38527
R-squared	0.066	0.065			0.073	0.072
F-stat of Instrument(s)	17.41	9.09	17.43	8.89	17.11	9.04

***significant at the 1% level **significant at the 5% level *significant at the 10% level

All standard errors are clustered at the university*subject level.

Table 3: Falsification Exercise: First Stages with Different Destinations

Dependent Variable: Indicator for Study Abroad in a certain area

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: Study Abroad in	Europe	Europe	USA	USA	Rest	Rest
ERASMUS Ratio	0.1840		0.0142		0.0046	
	(0.0419)***		(0.0155)		(0.0070)	
ERASMUS Indicator		0.0159		-0.0018		0.0009
		(0.0039)***		(0.0019)		(0.0012)
Female	-0.0016	-0.0016	-0.0011	-0.0011	-0.0015	-0.0015
	(0.0026)	(0.0027)	(0.0011)	(0.0011)	(0.0009)*	(0.0009)*
Apprenticeship	-0.0049	-0.0048	-0.0018	-0.0017	-0.0007	-0.0007
	(0.0025)*	(0.0025)*	(0.0011)	(0.0011)	(0.0008)	(0.0008)
Experience	-0.0011	-0.0012	0.0004	0.0004	-0.0004	-0.0004
	(0.0011)	(0.0011)	(0.0005)	(0.0005)	(0.0003)	(0.0003)
Parental Education Dummy 2	-0.0014	-0.0015	-0.0002	-0.0002	-0.0000	-0.0000
	(0.0024)	(0.0024)	(0.0011)	(0.0011)	(0.0009)	(0.0009)
Parental Education Dummy 3	0.0154	0.0151	0.0037	0.0036	-0.0001	-0.0001
	(0.0033)***	(0.0033)***	(0.0015)	(0.0015)	(0.0009)	(0.0009)
Studying in State of Highschool Degree	-0.0105	-0.0106	-0.0005	-0.0005	0.0013	0.0013
	(0.0054)**	(0.0054)**	(0.0022)	(0.0022)	(0.0022)	(0.0022)
Distance to High School State (100km)	0.0010	0.0011	-0.0002	-0.0002	0.0006	0.0006
	(0.014)	(0.014)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Follow-up Survey (Dummy)	0.0045	0.0048	-0.0014	-0.0014	0.0014	0.0014
	(0.0043)	(0.0044)	(0.0019)	(0.0018)	(0.0022)	(0.0012)
Parental Occupation Dummies	YES	YES	YES	YES	YES	YES
Graduate Cohort FE	YES	YES	YES	YES	YES	YES
Year Abroad FE	YES	YES	YES	YES	YES	YES
Subject FE	YES	YES	YES	YES	YES	YES
University FE	YES	YES	YES	YES	YES	YES
Instruments:						
ERASMUS	Ratio	Indicator	Ratio	Indicator	Ratio	Indicator
N	38527	38527	38527	38527	38527	38527
R-squared	0.064	0.063	0.074	0.074	0.032	0.032
F-stat of Instrument(s)	19.29	16.82	0.83	0.08	0.44	0.57

***significant at the 1% level **significant at the 5% level *significant at the 10% level

All standard errors are clustered at the university*subject level.

Table 4: Main Results

Dependent Variable: Working Abroad

	(1)	(2)	(3)	(4)	(5)
Estimation Method	OLS	IV	IV	IV	IV
Study Abroad	0.0611	0.2386	0.1444	0.2342	0.1890
	(0.0092)***	(0.1416)*	(0.0582)**	(0.2556)	(0.0820)**
Female	0.0060	0.0064	0.0062	0.0064	0.0063
	(0.0024)**	(0.0025)***	(0.0024)***	(0.0025)***	(0.0024)***
Apprenticeship	-0.0065	-0.0042	-0.0054	-0.0043	-0.0048
	(0.0023)***	(0.0029)	(0.0024)**	(0.0039)	(0.0026)*
Experience	0.0047	0.0051	0.0049	0.0051	0.0050
	(0.0014)***	(0.0014)***	(0.0014)***	(0.0015)***	(0.0014)***
Follow Up Survey (Dummy)	-0.0038	-0.0053	-0.0045	-0.0052	-0.0049
	(0.0052)	(0.0054)	(0.0052)	(0.0057)	(0.0053)
Graduate Cohort FE	YES	YES	YES	YES	YES
Year Abroad FE	YES	YES	YES	YES	YES
Subject FE	YES	YES	YES	YES	YES
University FE	YES	YES	YES	YES	YES
Instruments:					
ERASMUS		Ratio	Ratio	Indicator	Indicator
Interactions with subject			YES		YES
N	38527	38527	38527	38527	38527
R-squared	0.038				
F-stat First Stage		17.41	11.11	9.09	3.66

***significant at 1% level **significant at 5% level *significant at 10% level

All standard errors are clustered at the university*subject level. Dependent variable is an indicator for whether the respondent works abroad at the time of the survey. *Study abroad* is an indicator for whether the student spends part of her university career at a foreign university. See text for further details.

Table 5: Sensitivity Analysis 1 (Parental Background)

Dependent Variable: Dummy for Working Abroad

	(1)	(2)	(3)	(4)	(5)
Estimation Method	OLS	IV	IV	IV	IV
Abroad	0.0589	0.2354	0.1408	0.2404	0.1858
	(0.0091)***	(0.1424)*	(0.0586)**	(0.2602)	(0.0840)**
Female	0.0051	0.0059	0.0055	0.0059	0.0057
	(0.0024)**	(0.0025)**	(0.0024)**	(0.0027)**	(0.0025)**
Apprenticeship	-0.0043	-0.0028	-0.0036	-0.0028	-0.0033
	(0.0023)*	(0.0026)	(0.0024)	(0.0031)	(0.0024)
Experience	0.0047	0.0051	0.0049	0.0051	0.0050
	(0.0014)***	(0.0014)***	(0.0014)***	(0.0015)***	(0.0014)***
Follow Up Survey (Dummy)	-0.004	-0.0054	-0.0046	-0.0054	-0.0050
	(0.0052)	(0.0054)	(0.0052)	(0.0057)	(0.0053)
Parental Education Dummy 2	0.0076	0.0057	0.0066	0.0056	0.0061
	(0.0027)***	(0.0031)*	(0.0028)**	(0.0039)	(0.0028)**
Parental Education Dummy 3	0.0103	0.0043	0.0075	0.0041	0.0060
	(0.0031)***	(0.0056)	(0.0036)**	(0.0095)	(0.0043)
Parental Occupation Dummies	YES	YES	YES	YES	YES
Graduate Cohort FE	YES	YES	YES	YES	YES
Year Abroad FE	YES	YES	YES	YES	YES
Subject FE	YES	YES	YES	YES	YES
University FE	YES	YES	YES	YES	YES
Instruments:					
ERASMUS		Ratio	Ratio	Indicator	Indicator
Interactions with subject			YES		YES
N	38527	38527	38527	38527	38527
R-squared	0.040				
F-stat First Stage		17.429	10.907	8.893	3.419

***significant at 1% level **significant at 5% level *significant at 10% level

All standard errors are clustered at the university*subject level.

Table 6: Sensitivity Analysis 2 (Early Mobility)

Dependent Variable: Dummy for Working Abroad

	(1)	(2)	(3)	(4)	(5)
Estimation Method	OLS	IV	IV	IV	IV
Abroad	0.0581	0.2305	0.1378	0.2451	0.1789
	(0.0091)***	(0.1434)	(0.0569)**	(0.2592)	(0.0830)**
Female	0.0052	0.0059	0.0055	0.0060	0.0057
	(0.0024)**	(0.0025)**	(0.0024)**	(0.0027)**	(0.0024)**
Apprenticeship	-0.0046	-0.0031	-0.0039	-0.0030	-0.0035
	(0.0023)**	(0.0014)**	(0.0024)*	(0.0032)	(0.0025)
Experience	0.0047	0.0051	0.0049	0.0051	0.0050
	(0.0014)***	(0.0014)***	(0.0014)***	(0.0015)***	(0.0014)***
Follow Up Survey (Dummy)	-0.0040	-0.0053	-0.0046	-0.0054	-0.0050
	(0.0052)	(0.0054)	(0.0052)	(0.0057)	(0.0053)
Parental Education Dummy 2	0.0072	0.0056	0.0065	0.0055	0.0061
	(0.0027)***	(0.0031)*	(0.0028)**	(0.0038)	(0.0028)**
Parental Education Dummy 3	0.0096	0.0040	0.0070	0.0035	0.0057
	(0.0031)***	(0.0055)	(0.0035)**	(0.0091)	(0.0042)
Studying in Highschool State	0.0021	0.0045	0.0032	0.0047	0.0038
	(0.0057)	(0.0061)	(0.0057)	(0.0070)	(0.0060)
Distance to High School State	0.0033	0.0030	0.0031	0.0029	0.0030
(100km)	(0.0016)**	(0.0016)*	(0.0016)**	(0.0016)*	(0.0016)*
Parental Occupation Dummies	YES	YES	YES	YES	YES
Graduate Cohort FE	YES	YES	YES	YES	YES
Year Abroad FE	YES	YES	YES	YES	YES
Subject FE	YES	YES	YES	YES	YES
University FE	YES	YES	YES	YES	YES
Instruments:					
ERASMUS		Ratio	Ratio	Indicator	Indicator
Interactions with subject			YES		YES
N	38527	38527	38527	38527	38527
R-squared	0.040				
F-stat First Stage		17.107	11.126	9.035	3.425

***significant at 1% level **significant at 5% level *significant at 10% level

All standard errors are clustered at the university*subject level.

Table 7: Sensitivity Analysis 3 (Foreign Students at Home University)

Dependent Variable: Dummy for Working Abroad

	(1)	(2)	(3)	(4)	(5)
Estimation Method	OLS	IV	IV	IV	IV
Abroad	0.0581	0.2307	0.1373	0.2475	0.1781
	(0.0091)***	(0.1434)	(0.0566)**	(0.2592)	(0.0826)**
Female	0.0052	0.0059	0.0055	0.0060	0.0057
	(0.0024)**	(0.0025)**	(0.0024)**	(0.0027)**	(0.0024)**
Apprenticeship	-0.0046	-0.0031	-0.0039	-0.0029	-0.0035
	(0.0023)**	(0.0026)	(0.0024)*	(0.0032)	(0.0025)
Experience	0.0047	0.0050	0.0049	0.0054	0.0049
	(0.0014)***	(0.0014)***	(0.0014)***	(0.0015)***	(0.0014)***
Follow Up Survey (Dummy)	-0.0039	-0.0053	-0.0045	-0.0054	-0.0049
	(0.0052)	(0.0054)	(0.0052)	(0.0057)	(0.0053)
Parental Education Dummy 2	0.0072	0.0056	0.0065	0.0054	0.0061
	(0.0027***	(0.0031)*	(0.0028)**	(0.0038)	(0.0028)**
Parental Education Dummy 3	0.0096	0.0040	0.0071	0.0034	0.0057
	(0.0031)***	(0.0054)	(0.0035)**	(0.0091)	(0.0042)
Studying in Highschool State	0.0021	0.0045	0.0032	0.0047	0.0038
	(0.0057)	(0.0061)	(0.0057)	(0.0070)	(0.0059)
Distance to High School State	0.0032	0.0030	0.0031	0.0029	0.0030
(100km)	(0.0016)**	(0.0016)*	(0.0016)**	(0.0016)*	(0.0016)**
Foreign Students/Total Students	0.0083	0.0077	0.0080	0.0077	0.0079
	(0.0018)***	(0.0018)***	(0.0018)***	(0.0019)***	(0.0018)***
Parental Occupation Dummies	YES	YES	YES	YES	YES
Graduate Cohort FE	YES	YES	YES	YES	YES
Year Abroad FE	YES	YES	YES	YES	YES
Subject FE	YES	YES	YES	YES	YES
University FE	YES	YES	YES	YES	YES
Instruments:					
ERASMUS		Ratio	Ratio	Indicator	Indicator
Interactions with subject			YES		YES
N	38527	38527	38527	38527	38527
R-squared	0.040				
F-stat First Stage		17.11	11.12	9.06	3.42

***significant at the 1% level **significant at the 5% level *significant at the 10% level

All standard errors are clustered at the university*subject level.

Table 8: Sensitivity Analysis 4 (Time Trends and Additional FE)

Dependent Variable: Dummy for Working Abroad

		(1)	(2)	(3)	(4)	(5)
		OLS	IV	IV	IV	IV
Baseline specification	coefficient	0.0581	0.2305	0.1378	0.2451	0.1789
(as in Table 6)	(st. err.)	(0.0091)***	(0.1434)	(0.0569)**	(0.2592)	(0.083)**
	F-stat 1st stage		*17.107*	*11.126*	*9.035*	*3.425*
Including Subject-Specific	coefficient	0.0576	0.2438	0.0776	0.2235	0.1860
Time Trends	(st. err.)	(0.0091)***	(0.1515)	(0.0605)	(0.2953)	(0.1138)
	F-stat 1st stage		*15.793*	*8.682*	*6.809*	*1.898*
Including	coefficient	0.0568	0.2892	0.1122	0.3243	0.1161
University * Subject group FE	(st. err.)	(0.0092)***	(0.1690)*	(0.0609)*	(0.2817)	(0.0837)
	F-stat 1st stage		*16.851*	*13.789*	*8.130*	*2.971*
Distance home-college variables		YES	YES	YES	YES	YES
Highest Parental Education Dummies		YES	YES	YES	YES	YES
Parental Occupation Dummies		YES	YES	YES	YES	YES
Graduate Cohort FE		YES	YES	YES	YES	YES
Year Abroad FE		YES	YES	YES	YES	YES
Subject FE		YES	YES	YES	YES	YES
Instruments:						
ERASMUS			Ratio	Ratio	Indicator	Indicator
Interactions with subject				YES		YES
N		38527	38527	38527	38527	38527

***significant at the 1% level **significant at the 5% level *significant at the 10% level

All standard errors are clustered at the university*subject level. Note: This table only shows results for the coefficient of interest, studying abroad. Regressors not listed include female indicator, apprenticeship, potential experience. Panel 1 reports the results from Table 6. Panel 2 adds time trends for each subject to the main specification. In these regression we also include university FE as before. Panel 3 adds Fixed Effects at the university*subject group level to the main specification. The specifications reported in Panel 3 do not include university FE because we use the finer level of university*subject group FE. See text for details.

Table 9: Heterogeneity in Returns and Credit Constraints

	(1)	(2)	(3)	(4)
	Fraction in Sample	Delta (First Stage)	Lambda	Kling Weight
	w_j	$\Delta(StudyAbroad)_j$	λ_j	
Financial Aid = 0	0.59	0.011	0.11	0.46
Financial Aid = 1	0.41	0.016	0.12	0.54

Table 10: Destinations of work abroad

		Work abroad location			
		Europe	US	Rest	Total
Study abroad = 0		55.7	8.1	36.2	100.0
Study abroad = 1 in	Europe	66.4	4.9	28.7	100.0
	US	45.5	27.3	27.3	100.0
	Rest	16.7	0.0	83.3	100.0

Note: For all graduates working abroad, this table shows conditional probabilities of working abroad in one of the three locations Europe, US, and rest of world, conditional on the study abroad treatment and the destination of the stay abroad. Based on 1,316 observations from graduate cohorts 1993, 1997, and 2001.

Table 11: Reasons for working abroad

	All	Study Abroad = 0	Study Abroad = 1	Difference in means (p-value)
Interest in Foreign Cultures	52.95	50.93	67.21	0.000
	(1.59)	(1.71)	(4.27)	
Received Interesting Offer	35.85	35.35	39.34	0.389
	(1.53)	(1.63)	(4.44)	
At Employer's Instance	33.40	34.07	28.69	0.239
	(1.51)	(1.62)	(4.11)	
Better Career Prospects	25.36	25.81	22.13	0.382
in Germany after Return	(1.39)	(1.49)	(3.77)	
Obtain Qualifications Abroad	16.80	16.86	16.39	0.897
	(1.19)	(1.28)	(3.37)	
International Research Project	14.77	14.65	15.57	0.788
	(1.13)	(1.21)	(3.30)	
Partner	10.90	9.77	18.85	0.003
	(0.99)	(1.01)	(3.56)	
Employment Outlook Abroad	8.66	8.02	13.11	0.061
	(0.90)	(0.93)	(3.07)	
Career Prospects Abroad	6.52	5.70	12.30	0.006
	(0.79)	(0.79)	(2.99)	
Number of Observations	982	860	122	

Note: Based on all respondents from the 1997 follow-up survey who have work experience abroad. Table shows percentage of respondents who indicate that a particular reason led them to take up work abroad. Example: 50.93% of respondents indicate that interest in foreign cultures led them to take up work abroad.