

The Contribution of Study Abroad to Human Capital for United States College Students

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Abstract

In an era of increasing globalization, studying abroad may allow college students to form human capital in ways that cannot be done on the home campus, and enable them to earn higher incomes when they reach the job market. Using a unique data set that includes information on career earnings and study abroad in college, we investigate the human capital effects of study abroad. Simple regressions show that study abroad is correlated with significantly lower earnings in the workplace. However, controlling for gender eliminates the effect; women are more likely to go on term abroad and earn lower incomes. The human capital formed by study abroad is not more, nor less, than that formed by study on the home campus for the same period of time. This is true for the sample as a whole and for a variety subsamples of different majors and time periods. This implies that colleges seeking to maximize the workplace potential of their graduates need not emphasize study abroad more than they do the opportunities available on campus.

1. Introduction

The United States expends a considerable amount of time and money sending college students to study in foreign countries. As of 2009-2010, over 270,000 students per year at U.S. colleges chose to study abroad, more than four times than number that did so twenty-five years early (IIE, 2010). The United States government is sharply increasing funding to enable American college students to receive part of their education overseas (Salisbury et al, 2009). These students go abroad for many reasons, but for many of them, at least part of the reason is to build knowledge and skills for use in their post-college careers (Carlson et al, 1990). In an increasingly global workplace, it is quite plausible that study abroad will enable students to gain exposure to foreign countries, familiarity with other languages, awareness of and openness to a variety of perspectives on international and cultural issues, and other things that will enable them to form human capital and increase their productivity in the workplace after graduation.

Furthermore, the type of study abroad opportunities offered by U.S. colleges has changed along with the world economy. Forty years ago, study abroad was designed primarily for students studying the art, history, or literature of the country they were visiting; today they are much more likely to study the societies and cultures of those countries, which may be more attractive to students looking to develop skills useful in interacting with citizens of those countries in the global marketplace. They are also able to draw on a broader range of time spent abroad, including more short stays, than was previously the case. As a result, students in technical majors make up nearly twice the

share of students studying abroad than they did 25 years ago, and the share of students studying in host countries outside Europe has more than doubled (IIE, 2003).

However, we do not know much about how the incomes of these students are affected by their decision to study abroad. Past studies have tended to focus on cognitive effects of study abroad, or other measures of the study abroad experience which are not directly related to human capital formation. Other studies have examined the reasons why some students study abroad while others do not. To the extent that expected future earnings are one reason to study abroad, students who study abroad may not be representative of all students at the same colleges and universities. Women are more likely to study abroad than men are, while students from ethnic minority groups are rather less likely to do so. Students whose parents are college-educated are more likely to study abroad than first-generation college students are (Carlson et al, 1990). Measurements of human capital formation on study abroad should consider that study abroad may not be the same for all types of students, and that students who go may be those who are unusually likely to benefit from it, or most in need of it.

In this study, we measure human capital formation by American undergraduates studying abroad by regressing post-college incomes on their study abroad participation and other variables affecting human capital formation in college. We use a unique data set that matches a survey of 3679 alumni of a prominent college in the Northeast to the study abroad records of those alumni when in college. The alumni in the survey range in age from 23 to 65, so we can assess the impact of study abroad over the full career of graduates, rather than looking only at the first jobs out of college as has usually been done in previous

studies. The large sample size also allows us to consider the effects of study abroad on subsamples by gender, by choice of major, and by time since graduation. As a result, we are able to draw a much richer picture of the effects of study abroad on work experiences and income than is currently available.

We find that study abroad has little or no effect on human capital formation and earnings. Except in one subsample regression, we find no significant effect of studying abroad, either for a full academic term or for a shorter time. While students who study abroad tend to have lower incomes than those who do not, this is explained by the fact that students who go abroad are disproportionately female and majoring in languages or the humanities, both groups that earn lower incomes after college. We do not find differential impacts of study abroad on human capital formation between men and women, nor between different types of majors, nor between students who graduated in the 1970s, 1980s, or more recently. We use instrumental variables to estimate models that allow the decision to study abroad to be endogenously determined, but those models also fail to find any effect of study abroad on income, and produce results very similar to the least-squares results.

Of course, study abroad has an opportunity cost; it comes at the expense of a term in residence on the home campus, or other time in the home country where the student might engage in human capital forming activities. We conclude that study abroad is neither more nor less effective at forming human capital than study at the home campus or other home-country alternatives. This does not imply that study abroad is without value, but it does suggest that it is not a guaranteed route to higher income, and that students and

institutions should consider the advantages and disadvantages to studying abroad for their own circumstances when decide whether to go abroad or expand opportunities to study abroad.

2. Existing Literature

2.1. Benefits of study abroad

There is little existing literature on the contribution of study abroad to wages and human capital formation, most likely because of the difficulty of simultaneously observing wages, particularly in jobs after the first one, and study abroad participation. Most of the previous studies of study abroad have considered cognitive effects which can be observed shortly after students return from the program abroad. These effects, in general, are things that might be reasonably expected to increase human capital –for example, increased knowledge of and comfort with other cultures – but are not shown to do so.

Many studies have predicted that study abroad could contribute significantly to student development. The workplace is becoming increasingly global (Opello and Rosow, 2004) and study abroad may help students succeed in that global workplace (Norris and Gillespie 2009). Study abroad may help students develop language skills (Citron, 1995) or international understanding (Sharma and Mulka 1993, Douglas and Jones-Rikkens, 2001). Increased linguistic and cultural literacy may help firms expand export sales (Loughrin-Sacco and Earwicker 2003). Study abroad in technical fields may allow students to capture specialized knowledge which is valuable in their home county (Kim, 1998). For business schools, study abroad “is an effective way to accomplish internationalization of faculty and

students.” (Hult and Lashbrooke, 2003, p. xv). Students experience personal growth on study abroad which may provide necessary maturity for workplace success (Hoffa 2007). They may acquire more favorable attitudes towards foreign cultures (Kitsantas 2004). The value of study abroad may be greater for women, whose learning styles differ from those of men and who learn more by experience (Baxter Magolda 1992), and who are the majority of study abroad students. There may be specific types of human capital which can only be learned in particular countries (country-specific skills) which cannot be replaced by more general human capital (e.g., language skills) which can be learned at home (Wiers-Jenssen and Try, 2005)

Carlson et al (1990) studied a sample of students from four American colleges and universities, who studied abroad in one of four European countries, and assessed a variety of cognitive changes in those students, relative to a control group that did not study abroad. They used pre- and post-testing of students in both groups to measure changes in student knowledge and attitudes. They found that study abroad significantly increased interest in international affairs and made students somewhat more willing to be critical of American foreign policies, perhaps as a result of increased interest in them. However, they did not find significant increases in cognitive aspects of international understanding as a result of the study abroad. They did find that students who had been on term abroad reported that they regarded higher-order learning skills as more important after going abroad. For instance, students considered “systematic thinking” to be more important to their own learning after going on term abroad, and considered “learning facts” to be less important. They found no indication that study abroad increased student self-confidence or

sociability.¹ They did find that students were more set in their career goals after study abroad, but the comparison group had similar gains over the same time period, so the changes were probably not due to the study abroad experience.

More recently, McKeown (2009) studied students from eight American colleges and universities studying abroad in twenty-five different countries, again using pre- and post-testing to measure cognitive changes during the study abroad. He found no significant increase in intellectual development during the study abroad, as measured by the MID (Measurement of Intellectual Development) instrument administered in the pre- and post-testing. However, it is not unusual for the test not to show improvement over one-semester intervals, except where there are significant interventions during the interval (i.e., completion of a senior capstone course). He does find, however, that students with no previous international experience did more poorly on the pre-tests than students who had such experience, but caught up during their study abroad. He refers to this as the “first-time effect” and concludes that even a relatively brief international experience contributes to intellectual development if it is the first such experience for that student.

Several previous studies have expressed concern that academic standards are not as rigorous on study abroad as they are at the home campus. McKeown (2009) finds that study abroad is less likely to be linked to an academic discipline than is study on the home campus, and also that learning outcomes (and student expectations of them) may be more superficial in study abroad. However, this may be offset by having non-academic events

¹ Increased self-confidence and sociability might increase social capital as well as human capital. For a discussion of the relationship between social capital and income, see Mara (2010). We do not, however, consider social capital as a phenomenon separate from human capital in this paper. To the extent that such effects exist, they will be captured in our measures of human capital accumulation.

while abroad that cannot be duplicated at home. Carlson et al (1990) found that students at some, but not all, study abroad programs rated those programs as having lower academic standards than their home campus; no program was rated as having higher standards.

A small number of studies have been able to link study abroad experiences to subsequent experiences with career experience and wages, though in some cases the students are receiving most or all of their education abroad, rather than a single semester. Wiers-Jenssen and Try (2005) study Norwegians who have degrees from foreign countries, within five years after graduation. They find that students with foreign degrees are more likely to be unemployed, or underemployed for their skills, compared to students educated in Norway. However, conditional on employment, wages for foreign-educated students are higher. The differences are not large in either case. It may be that skills learned abroad transfer only imperfectly back to the home labor market; on the other hand, going abroad may be a signal of otherwise unobservable quality to employers. Paflika (2003) looks at study abroad by college students in Mexico to see if it increases employment chances or wages in the first six months after college. She similarly finds that foreign study makes it harder to find a job initially (in her model, the duration of initial unemployment post-college rises) but that students with foreign study earn higher wages once employed.

2.2. Types of study abroad and their effect on learning

Different study abroad programs may have different effects on human capital formation, depending on how they are designed. Past studies have looked at several different types of study abroad programs and asked how their effects on students may differ. Study abroad programs differ in the duration of the study abroad, whether a foreign language is used in

the study abroad, and the extent to which the students are immersed in the culture of the host country, or remain separate from day to day life in the country. Some of these alternatives may create a more effective study abroad experience, but if in doing so they make it more expensive, may limit the number of students who can take advantage of the opportunity to study abroad. Shorter programs which do not require language preparation may be more accessible to large numbers of students but may not produce as strong an effect on student development.

The duration of study abroad programs varies considerably; some are a full year or longer, while others can be as short as 3 to 4 weeks. Llanez and Munoz (2009) study the effect of short stays in Spanish-speaking countries on foreign language proficiency. They find statistically significant improves language skills in a number of dimensions. McKeown (2009) finds that international exposure for time periods as short as two weeks significantly affects intellectual development of students. First-year college students have a strong preference for one-semester or longer programs over short study programs (Hesel and Green 2000) but business school students are more evenly divided in their preference for longer vs. shorter experiences (Holland and Kedia 2003). The extent to which cultural immersion varies across term abroad programs has been widely documented (Engle and Engle 2003) but there is little known about whether different degrees of immersion produce different learning outcomes. McKeown (2009) concludes that “the language of the study abroad country and the degree of cultural immersion did not have an impact. Only the degree to which the study abroad was the first serious international encounter mattered.”

The design of the study abroad program can also affect outcomes, and designs have changed in the last thirty years. Vande Berg (2003) says “we’re now too often framing study abroad for our students as primarily an *academic* activity, simply an extension of on-campus course work... rather than as a broader *educational* opportunity that will allow them to develop skills that will prove useful to them after they graduate.” He argues that this may interfere with the ability of study abroad to help students learn. Citron (1996) finds that programming that provides orientation and guides learning opportunities, along with the presence of a program director, increases the amount of cultural integration that takes place during the study abroad.

2.3. *Reasons for choosing to study abroad*

One important issue, though one not always considered in evaluating study abroad classes, is that students who go abroad are not a random sample of students, but choose whether to go abroad or not. It is plausible that there may be sample selection; students for whom study abroad is particularly beneficial, either in terms of human capital formation or in other ways, are more likely to go. This has usually been controlled for, if at all, by using comparison groups of otherwise similar students who did not go on terms abroad. Past researchers have looked at reasons why students choose to go abroad; their findings are capable of shedding some light on the question of whether there is sample selection in the decision to study abroad, and if there is, how to deal with it.

Carlson et al (1990) find that students who go abroad cite many reasons for going, including “desire for a foreign cross-cultural experience, improvement of foreign language ability, desire to live in/make acquaintances from another country, interest in gaining

another perspective on their home country, desire for travel, and enhancement of understanding of a particular host country. Ranked just below these categories was the expectation that the study abroad experience would improve career prospects.” Students who went on terms abroad were initially less set in their career goals than students in their control group. Students who went on terms abroad were more likely to be majoring in humanities and the social sciences and less likely to be in sciences and engineering, compared to the control group, but grade point averages and other measures of academic achievement were comparable. They also found that students who studied abroad were more likely to be knowledgeable about foreign affairs before going, and less likely to be satisfied with educational opportunities on their home campus.

Salisbury et al (2009) survey incoming first-year college students and ask whether they intend to study abroad while at college. They find that higher socioeconomic status makes students more likely to study abroad. Men are less likely to be interested than women, and black and Hispanic students not less likely to be interested, though Asian Pacific Islanders are less interested. Literacy and openness to diversity are strong predictors of intention to study abroad, as is parental education. Holland and Kedia (2003) find that high school students intending to study abroad cite cultural expansion and travel as the main reasons; only 11% mention improved job prospects, and only 3% language study. Business school students, in contrast, are much more interested in possible career advantages that study abroad offers them.

3. Data and Methods

In this study we explicitly measure the contribution of study abroad to human capital formation. We do this using a unique data set which matches salary information to study abroad experiences for 3679 alumni of a prominent liberal arts college in the Northeast. Salary information comes from a survey of these alumni described in Mara (2010). We matched this data to the records of the college's study abroad program, enabling us to measure the contribution of study abroad to income and labor market participation.² The alumni are drawn from the entire age distribution, so we have the ability to see whether study abroad influences income and employment for the entire breadth of a student's future career. Previous studies have generally only been able to track income and wages for a relatively short time after graduation. We also have a sufficiently large sample to be able to estimate the effects of study abroad on a number of subsamples, to allow for the possibility that study abroad affects some types of students differently than others.

The basic equation we will estimate is a standard Mincer (1958) equation:

$$\text{Log}(\text{income}) = \beta_0 + \beta_1 * \text{Study Abroad} + \beta_2 * Z + \epsilon \quad (1)$$

where Z is a vector of other variables that may affect incomes, including age (serving as a proxy for workplace experience), possession of a graduate degree, parental education, college grade point average, college major³, other variables describing college experience

² Unfortunately, the survey data asked about income, and did not ask about hours worked, making it impossible to convert reported income to wages. Also, income includes non-labor income, though if this is the result of capital investment from earlier labor income, then human capital may be contributing to it as well.

³ Including major as an exogenous variable implies that students choose majors first and only subsequently decide whether to go on term abroad. We will show some regressions that exclude choice of major to show how possible endogeneity of this variable could affect the results.

such as Greek status, participation in athletics and extracurricular activities, and drinking habits when in college, race and gender, and two social variables: self-described physical attractiveness when in college, and whether the student had a steady relationship in high school.

Study abroad is measured using two variables, to reflect two different types of study abroad experiences offered by the college providing the data. Most of the students who went on study abroad went on programs lasting for one term.⁴ However, starting in the mid-1980s, the college began to offer shorter study abroad program called mini-terms abroad. These programs take place outside of the academic terms, and hence do not cause the student to give up a term of on-campus study, as the full terms abroad do. We measure both the number of (full) terms the student studied abroad and the number of mini-terms the student studied abroad. A few students have both types of study experience, or have multiple experiences of one type. In some regressions we measure whether the student did or did not have a term or mini-term abroad, rather than the number; the results are generally not sensitive to the distinction since most students who had one of either type had only one.⁵

In order to address possible sample selection issues, we will also estimate models predicting who choose to go on study abroad. We assume that students have an expected

⁴ The college in question has switched between a two-semester academic year and a three-term academic year. Almost all of the students in the sample attended during the time when there was a three-term academic year. There are not enough students in the sample from the two-semester academic year to treat them separately; we implicitly treat a one-term and one-semester program as equivalent as a result. Also, the college was all male prior to 1970, so in the early years there are no female students. The gender ratio became nearly 50/50 just a few years after 1971.

⁵ Some of the terms abroad go to countries where the native language is English. Such terms may not offer the same opportunities to develop human capital as those to countries where foreign languages are used. In this version of the paper we do not distinguish between these types of terms, but a future revision will do so.

utility function, calculate their expected utility for a college experience in which they study abroad and for one in which they do not, and go abroad if the expected utility for doing so is higher. This model gives rise to a standard probit model:

$$NU^* = \gamma_0 + \gamma_1 * X + \varepsilon \quad (2)$$

where the student studies abroad if the net utility of doing so, NU^* , is positive, and does not if it is negative. Expectations of future income could be one variable affecting the decision to go abroad, so if the student has knowledge of his or her career prospects that is not measured by the data, the error term in the wage equation may be correlated with the one in the selection equation. The variables in X need to be exogenously set before the decision to study abroad or not is made. We include age, race, gender, parental education, choice of major, grade point average, and participation in the Greek system as explanatory variables.⁶ The means and standard deviations of all variables used in the analysis are found in Table 1. The students reported very large numbers of majors, and many of them reported more than one major. Rather than include dummies for each major, we aggregated the students into seven categories: languages, humanities exclusive of languages, social sciences, sciences, engineering, interdisciplinary programs, two majors in different divisions of the curriculum (counting languages as separate from humanities, for this purpose), and organizing theme majors (which are self-designed and draw on at least three departments). A student who has two majors, both in social sciences divisions (for example, economics and history), is classified as a social sciences major. We also include a

⁶ Students generally do not go on term abroad until junior year, and decide whether to join a fraternity or sorority as first-years or sophomores. Similarly, choices of majors are made in advance of the decision to go on term abroad. If, however, these decisions are correlated with unobserved factors affecting the decision to study abroad, they may not be strictly endogenous – we intend to examine this possibility in a future revision.

variable indicating whether the student has a major in the languages or not; this category includes all language majors and those students with two majors crossing disciplines who have a language as one of the two.

4. Results and Discussion

4.1. Least Squares Estimates

Our main question is whether students who study abroad subsequently have higher or lower incomes than those who do not. If we do not control for any other variables, we find there is a strong and negative correlation between going on terms abroad and income. Table 2 shows the results of regressing the log of income on the number of terms and mini-terms of study abroad, and in an alternative specification, on a dummy variable indicating whether or not the student went on any term or mini-term. The sample excludes students who reported zero income (to avoid problems with taking logs), as will be the case throughout the paper. Going on a term abroad reduces income by more than 20%, and going on a mini-term abroad by more than 70%. However, these results are specious, especially the latter, because mini-terms were not available before the mid-1980s and earlier graduates tend to have higher incomes. Controlling for age greatly reduces the size of the effects. With age controls, going on a term abroad reduces income by approximately 5%, which is a much more reasonable magnitude. Going on a mini-term abroad has no significant effect on income; the point estimate suggests a reduction of 2.5% to 3%, which is reasonably small in economic terms (though it does imply a reduction of several

thousand dollars per year for a student with an average income). Age has the usual increasing at a decreasing rate effect on incomes, with income peaking around age 55.

However, controlling for factors besides age eliminates the effect of both types of terms. We estimate equation 1 using all 2984 observations with complete data on all variables used to predict incomes. Results are found in the first column of table 3. We estimate four specifications; in the first pair we use all variables, and in the second pair we remove a number of variables that were insignificant in the first pair (which slightly increases the sample size). Within each pair, one regression uses number of terms and mini-terms abroad and the other uses dummies indicating whether the student went or not. All four show no significant effect of study abroad on later income, with point incomes under 2.5%, indicating quite small effects. They do show the expected age profile. A one-point increase in GPA (C to B average or B to A average) raises income by approximately 18%. Humanities majors and those majoring in languages have incomes 20% to 30% lower, and surprisingly, engineers have incomes about 7% lower, than the omitted category of major, which is students with two majors in different divisions. Graduate degrees increase income by about 3.5% or 4% but the effect is not significant. Asian students show considerably higher incomes than those of the omitted ethnic group, Caucasians; other ethnic groups have no significant differences.⁷ Female students have incomes about 13% less than male students. Greek students have incomes about 13% higher than non-Greek students; the effect appears to be weaker for female students who join sororities than male students who join fraternities, but the difference is significant only in some specifications and then only at the

⁷ This result is surprising, but comes from the fact that a student cannot be in the sample without graduating from a highly selective college. Students of disadvantaged ethnic groups are less likely to appear in the sample; those who do appear to have overcome the disadvantages as well as possible workforce discrimination.

10% level. Participation in varsity sports increases incomes, while participation in performing arts reduces them, at a rate of 1% to 2% per year per activity (that is, someone who plays two sports for four years, or participates in four performing arts events for two years each, has a value of 8 for this variable.) Students who self-rate themselves as physically attractive have higher incomes by about 9% per increase on a 1-5 scale; this is consistent with past literature that shows a correlation between beauty and income (Hamermesh and Biddle 1994). Drinking more nights per week in college raises incomes by about 5% per extra night (even though Greek status is controlled for) but the amount drunk per night does not affect income (though grades are controlled for, so heavy drinking may reduce income by lowering grades).

Clearly adding controls has eliminated the apparent effect of study abroad on later incomes. The controls that turn out to matter are gender and choice of major; women and humanities majors are more likely to go on terms abroad and also tend to earn lower incomes. To demonstrate this point, Table 4 shows results of estimating equation (1) omitting those variables but keeping all other controls. When we do not control for gender and major choice, we again find that going on a term abroad reduces incomes by about 5% per year, and that going on a mini-term abroad has a similar effect but the estimate is not significantly different from zero.

4.2. Treating Study Abroad as Endogenous

One possible problem with the above results is that students are not randomly assigned to study abroad; the choice of going on study abroad may be endogenous. It is possible that study abroad is a valuable, human-capital-forming experience, but unobservably poor

students are more likely to go abroad, masking the effect. If we can identify valid instruments, we can estimate equation (1) by two-stage least squares and consistently estimate the effect of study abroad on wages.

We consider two sets of possible instruments. One set of instruments measures the availability and use of study abroad options in the year the student graduated college. This set includes the number of destinations available, the fraction of students in the given student's class that studied abroad, the percentage of all US college students that studied abroad in that year, and the percentage of foreign students in US colleges in that year. We include the last variable because students could become interested in travel abroad by meeting foreign students, and because it gives information about the ease of travel between the United States and foreign destinations. The advantage of these instruments is that since they are not specific to the student, they are almost certainly not correlated with the unobserved productivity of that student; hence they are almost certain to be exogenous. The drawback is that, for the same reason and because they have no variation among students who graduate in a given year, they may be weak instruments for predicting which students go and which do not. The second set of instruments we use is specific to the student, and contains variables that may help predict who goes abroad but which, conditional on admission to this college, may not affect productivity. We include whether the student's mother, father, or both are college-educated, the amount of time the student spent doing homework in high school (an indicator of general studiousness), and whether the student had a steady relationship in high school (having had a steady relationship in

high school, which presumably increases the odds of also having one in college which one might not wish to disrupt, reduces the odds of going abroad).⁸

We estimate equation (2) to see if the potential instruments help determine whether students choose to go on study abroad. Results of the estimation are shown in Table 5.⁹ The estimates for going on a mini-term abroad using only data from 1986 and later, as mini-terms were not an option prior to that year. The second set of instruments does affect the decision to study abroad. Parental education strongly increases the chances of studying abroad. Time spent doing homework in high school also increases the chance of studying abroad, and a steady relationship in college reduces the chance that a student will choose to go abroad.

Other results in Table 5 show that full terms abroad and mini-terms abroad tend to act as substitutes. Language majors are much more likely to go on a full term abroad and much less likely to go on a mini-term abroad, the point estimates being nearly equal in magnitude, opposite in sign, and all significant. Engineers, by contrast, are less likely to go on a full term abroad and more likely to go on a mini-term abroad; again the point estimates are nearly equal in magnitude, but the estimates for mini-terms are not significant. Older students are more likely to have been on a full term abroad and less likely to have been on a mini-term abroad; this suggests that as mini-terms became more widely available they took market share away from the full terms abroad. Higher college grades

⁸ In theory, of course, general studiousness and affability might affect human capital formation (or social capital formation) and hence lifetime earnings; but the empirical evidence suggests not. It would be very difficult to identify an instrument that would affect an individual's decision to study abroad that would not, in some way, influence earnings potential, if only because openness to unfamiliar situations is potentially valuable in the workplace. For this reason we will separately test the validity of the student-specific instruments.

⁹ The first set of instruments are not included in Table 5, but will be added to a future version of the paper. They are included in the first stage regressions from the two-stage least squares in Table 6 below.

increase the odds of going on a full term abroad but not a mini-term abroad; this may reflect selection criteria for the full terms abroad, which are more likely to be competitive. Varsity athletes are less likely to go on a full term abroad, though the point estimate is quite small, but have the same probability as non-athletes for going on a mini-term abroad, which does not come at the expense of possible practice time. Women are much more likely to go on both terms abroad and mini-terms abroad, consistent with the literature. In contrast, African-American students are much more likely to go on full terms abroad; this may be idiosyncratic to particular offerings at the college providing the data. Asian students are more likely to go on a mini-term abroad and less likely to go on a full term abroad; this odd result may be driven by pre-medical students who are disproportionately Asian and may find it hard to take a full term away from campus. Interestingly, number of nights drinking increases the odds of taking a full term abroad, but does not affect the odds of going on a mini-term abroad; intensity of drinking increases the odds of going on a mini-term but not a full term.

Using these instruments, we estimate equation (1) by two-stage least squares. In the results that follow, we exclude mini-terms abroad from consideration and focus only on the decision to go abroad for a full term.¹⁰ First stage results are shown in Table 6. We show results using both sets of instruments and only showing the first set of instruments, to be robust in case the second set of instruments turns out not to be exogenous. We also show results excluding the variable for the percent of US students studying abroad, because this

¹⁰ In other results, not shown here, we do consider mini-terms and find that they have no significant effect on human capital, but their coefficients are very poorly estimated.

variable is not available every year and using it reduces the sample size.¹¹ Several of the instruments from each set are significant. The F-statistic for dropping the instruments from the first-stage regression is consistently greater than 10, indicating that the instruments are acceptably strong (even the first set alone).

Results of the second stage are shown in Table 7. The results are very much the same as in the least squares regressions found in the corresponding columns of Table 3. Study abroad continues to have no significant effect on income. The standard errors of the estimate for the effect of term abroad are about five times larger than the OLS estimates, because 2SLS is not an efficient estimator. Coefficients of other variables have changed very little and all earlier conclusions still hold. In the model using all nine instruments, the Hansen J-test for overidentifying restrictions gives a test statistic of 8.091 against a chi-square-8 critical value of 15.50. This means that, as long as any one of the first set of instruments is valid, we do not reject the overidentifying restrictions of the second set of instruments, nor of the other instruments in the first set. We also test the exclusion of the second set of instruments conditional on the first set; the F-statistic is 0.899 (p-value of 0.48) if the percent going abroad is used and 0.514 (p-value of 0.77) if it is not.

Conditional on these instruments, we can test the exogeneity of the decision to go on a term abroad. We conduct Durbin-Hausman-Wu tests using each of the four combinations of instruments. The test statistics range from 0.60 to 0.95; in all four cases we cannot reject the exogeneity of the decision to study abroad. Students who study abroad do not have

¹¹ The data is collected by the Institute for International Education. Recently it has been collected annually, but for a period of time in the 1990s it was collected only alternate years, and was not collected at all for a number of years in the 1970s and a few in the 1980s. When we have a gap of only one year in the annual sequence, we interpolate; when we have a gap of more than one year, we leave the variable missing. As a result, regressions using this variable lose about 1/6 of the sample.

lower (or higher) unobserved productivity than those who do. Since this variable appears exogenous, and since OLS is a much more efficient estimator than 2SLS, we present OLS estimates in the remainder of the paper.

4.3. Working Full-Time or Part-time

Another possible problem with the results thus far is that they present annual incomes rather than hourly wages. Not all respondents work full time; the ones that do not will have lower annual incomes even if they have the same, or higher, productivity. This may be particularly true for workers relatively late in their careers. It could be the case that students who go on terms abroad are less likely to be full-time workers, which could mask a possible productivity-increasing effect of terms abroad.

To test this possibility, we re-estimate equation (1) using only full-time workers. Results on this sample are shown in Table 8; they are quite similar to those found in Table 3. The point estimates of the income effect of studying abroad are somewhat higher than before but still insignificant. The most important substantial change is that ethnic group no longer affects incomes at all. Most of the point estimates are slightly larger than they were in the previous sample, though not significantly so; one exception is that the coefficient gender is reduced (in absolute value) from -0.35 to -0.27. Women continue to earn much less than otherwise comparable men, but the gap is smaller when we look only at full-time workers.

To examine the possibility that study abroad affects the decision to work full time, we estimate probit regressions of the form:

$$NUW^* = \pi_0 + \pi_1 * \text{Study Abroad} + \pi_1 * Z + \varepsilon \quad (3)$$

where the student chooses to be a full-time worker at the time the survey is given if his/her net utility for working, NUW^* , is positive, and otherwise does not, and Z are the same variables used in equation (1). Results of estimating equation (3) are found in Table 9. Study abroad has no significant effect on subsequent workforce participation, and the estimated betas are extremely small; about 0.01 for terms abroad, -0.06 for mini-terms abroad in the full model and -0.02 in the restricted model. Choice of major does not affect the probability of working full time; college grades, and one in specification a graduate degree, do so only at the 10% level. Women and older graduates are substantially less likely to work full-time than men and younger graduates.

4.4. Testing for Heterogeneous Responses

Another possible problem with these results is that the effect of study abroad may be different for different students. Different majors may benefit from study abroad in different ways; for example, it may benefit language majors more than it benefits engineers. Or it may have different effects for different cohorts; its importance may be greater in more recent years, or it may be greater at different stages of a career. Or its effects may differ for men and women. To allow for these possibilities, we estimate the regression separately for subsamples by major, gender, and era of graduation.

Results of estimating the regression separately for men and women are found in Table 9. Studying abroad has no significant effect on income for either gender. The point estimates for men are very small, 1.5% or less; the point estimates for women are larger, between 4% and 7%, but not significantly different from zero. College grades and graduate

degrees increase income for men but not for women, and similarly, variables describing college activities are significant only for men. This may occur because, as shown above, women are less likely to be in the workforce than men. Table 9 also reports the results of the regressions limiting the sample only to full-time workers. In this sample, studying abroad has significant and fairly large effects on women's income; going on a full term abroad increases a woman's income by 8.9%. Going on term abroad has no significant effect on men's income, and the point estimate is only 1.1%.

Table 10 shows the results of estimating the regression separately for five categories of majors: languages and humanities majors, social sciences majors, science majors, engineering majors, and students with two majors in different divisions.¹² Study abroad is not significant for any group, neither for a full term nor for a mini-term, and the point estimates are of differing signs. Other results are generally consistent with the previous results, though the humanities subsample has fewer significant results due to the smaller sample size. College grades are not significant for humanities majors, and graduate degrees matter only for scientists and engineers. Physical appearance doesn't matter for engineers, with a point estimate of 0.001, and for engineers, nights spent drinking don't matter but the amount does, with higher drinking levels raising income (holding grades constant).

We also estimate the result separately for different age groups. Globalization is a relatively recent phenomenon, and it might matter more for students in recent class years and less for students in earlier class years. Or the benefits of studying abroad may not be

¹² There are only 53 students in the sample majoring only in languages; to improve estimating efficiency we pool them with humanities majors. The regression cannot be run separately for them because none of those 53 students went on a mini-term abroad, though it can be run for them excluding that variable. The results of such a regression are not particularly sensible, probably due to the small sample size, and are not shown here. There are only 56 students majoring in interdisciplinary programs and only 8 organizing theme majors; we do not consider those subsamples.

apparently early in a worker's career but may show up later if they increase raises or chances of promotion. Also, the changing character of study abroad programs over time as they have become more popular, or as colleges have learned how to operate them effectively, could also cause differences between students of different cohorts. Because all our salary information is collected in a single year, we cannot separate the effects of different cohorts from the effects of different career stages; but we can see if the combination of the two affects the contribution of study abroad to earnings.

To test this hypothesis, we divide the sample into three roughly equal chronological groups: students who graduated between 1965 and 1979, those who graduated between 1980 and 1994, and those who graduated between 1995 and 2008. If globalization makes study abroad more important in the workplace, or if study abroad programs have become more effective over time, we would expect stronger effects of study abroad for the last group; if credentials and college experiences matter more for workers with less workplace experience, then that will also imply stronger effects for the last group.

Results of the estimation are found in Table 9. We drop the quadratic term on age since it cannot be separately identified with the shorter age ranges in these subsamples, and mini-terms abroad did not exist for the 1965-1979 cohort so that variable is removed for that cohort only. Study abroad has no significant effect on income for any of the three cohorts; the highest point estimate (6.6%) is for the 1965-1979 cohort. There are some substantial differences in the effect of major choice on income across cohorts. In particular, social sciences majors have 15.2% lower incomes in the 1980-1994 cohort but not in either of the others, and science majors have 16.6% higher incomes for the 1965-1979 cohort but not the others. Majoring in an interdisciplinary program raises incomes significantly for the

1965-1979 cohort and lowers them for the 1980-1994 cohort, but in both cases the number of program majors in those cohorts is low (31 in 1965-1979, 12 in 1980-1994) and the results are probably driven by outliers. The effects of gender on income have dropped substantially, being 41.3% lower for women in 1965-1979 and only 20.3% lower in 1995-2008, though all three effects are significantly negative and even a 20.3% income penalty is economically very large. Greek status is significant for the first two cohorts but not for the youngest cohort, and only for men in the middle cohort.

5. Conclusions

Our regression results show that there is virtually no effect of studying abroad on future income for the students in our sample. Since our sample is limited to students from one college, we must be careful in generalizing to any larger population. However, to the extent that students at this college are representative of students at other colleges and universities, and that this college's study abroad programs are similar to those of other colleges and universities, the results suggest that students who go on study abroad do not accumulate more human capital, nor less, than students who do not study abroad. Nor does study abroad cause students to be more likely to be working full time. This finding is robust to several specifications of the equation, so long as gender and choice of major are controlled for, and is found in subsamples by gender, major, and time period as well as in the full sample. It exists both for all students in the sample and for those who are employed full time. It exists in both least-squares regressions and instrumental variables regressions in which the decision to study abroad is treated as endogenous, though the data show that

study abroad is in fact exogenous. The only equation in which we find a significant effect of terms abroad on earnings is for female students who work full time and went on a full term abroad.

This does not imply that study abroad does not develop any human capital. A full term study abroad requires the student to not be on his or her home campus for a term, and thus comes at the opportunity cost of a term in residence. The appropriate conclusion is that the human capital formed while on study abroad is, at least approximately, equally valuable to the human capital that would have been formed had the student stayed in residence for one additional term. Given the known value of college study in forming human capital, the results show that study abroad is valuable – just not more valuable than study at home. This could suggest that study abroad is no different from study at the home campus, but a more plausible interpretation is that study abroad has advantages and disadvantages that offset each other. The advantages of being exposed to a foreign culture, developing language skills, and having non-academic opportunities unavailable on the home campus may be equal to the disadvantages of travel disruption, possibly less rigorous standards for education, the tendency to sight-see rather than study, and difficulty integrating the foreign study into the rest of the student's college experience. A mini-term abroad does not displace a corresponding period of academic study, but does displace one month's non-academic time, which may be used for an internship or other human capital forming activities if not spent abroad. However, if it is the case that more human capital is formed in a term of residence in college than is formed in a month of academic break, then presumably it is also the case that the full term abroad forms correspondingly more human capital than a mini-term abroad does.

More generally, the results suggest that study abroad does not, on average, produce higher income after college. Students who are deciding whether to go on study abroad, and institutions decide whether or not to offer it, should consider whether the advantages will outweigh the disadvantages in their own circumstances. They should also consider whether non-economic benefits and costs will justify, or not justify, the decision to go on, or offer, study abroad. But study abroad should not be viewed as a method of increasing human capital formation for all students; on average it is neither better nor worse than staying at home and taking advantages of human capital forming opportunities there.

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Table 1. Means and standard deviations of variables

	Units	Mean	Max	Min	Std. Dev.
INCOME	\$ 1000s	136.8719	350	35	106.477
LOG(INCOME)	-	4.637745	5.857933	3.555348	0.749058
WORKFULL	Dummy	0.818182	1	0	0.38865
NUMTERMS	Number	0.392493	2	0	0.531036
NUMMINIS	Number	0.022061	2	0	0.153486
WENTONTERM	Dummy	0.370761	1	0	0.483088
WENTONMINI	Dummy	0.021073	1	0	0.143653
AGE	Years	42.85018	66	23	12.36437
COLGRADE	0-4 scale	3.23217	4	1	0.490109
GRADDEGREE	Dummy	0.647689	1	0	0.477758
HOMEWORKHRS	Hours	16.29865	45	4	8.638054
MAJLANG	Dummy	0.055647	1	0	0.229277
MAJONLYHUM	Dummy	0.078696	1	0	0.269308
MAJONLYSOCSCI	Dummy	0.37109	1	0	0.483176
MAJONLYSCI	Dummy	0.148831	1	0	0.355981
MAJONLYENG	Dummy	0.162331	1	0	0.368815
MAJONLYLANG	Dummy	0.015147	1	0	0.122156
MAJONLYPROG	Dummy	0.014488	1	0	0.119511
MAJOT	Dummy	0.002305	1	0	0.047962
AFRICANAMER	Dummy	0.011854	1	0	0.108246
HISPANIC	Dummy	0.007573	1	0	0.086709
ASIAN	Dummy	0.012183	1	0	0.109721
MULTIRACIAL	Dummy	0.006585	1	0	0.080896
OTERRACE	Dummy	0.005927	1	0	0.076771
FATHERCOLL	Dummy	0.177478	1	0	0.382135
MOTHERCOLL	Dummy	0.066842	1	0	0.24979
BOTHCOLL	Dummy	0.489957	1	0	0.499981
VARSIITYEARS	Years	1.328943	12	0	2.321662
GREEK	Dummy	0.498518	1	0	0.50008
FEMALE	Dummy	0.381956	1	0	0.485946
PERFORMYEARS	Years	0.761607	20	0	1.851485
PHYSICAL	1-5 scale	3.480408	5	1	0.687763
DRINKNIGHTS	Number	2.574251	7	0	1.522612
DRINKLEVEL	1-5 scale	1.851986	4	0	0.889149

Table 2. Effect of study abroad on income, no controls

Dependent variable: Log(income)

	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
C	4.750347 0.015704	4.758269 0.01591	1.429945 0.143003	1.434081 0.143286
NUMTERMS	-0.231665 0.023672		-0.050737 0.021732	
NUMMINIS	-0.667279 0.085336		-0.024528 0.076859	
WENTONTERM		-0.264656 0.02597		-0.052329 0.024007
WENTONMINI		-0.734252 0.090903		-0.032248 0.082149
AGE			0.130823 0.006929	0.130596 0.00693
AGE2			-0.001196 7.96E-05	-0.001193 7.96E-05
R ²	0.043041	0.045786	0.275163	0.275017
N obs	3405	3405	3405	3405

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 3. Effect of study abroad on income

Dependent variable: Log(income)

	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
C	0.461949 0.189687	0.460316 0.189842	0.454434 0.184105	0.453598 0.184259
NUMTERMS	0.024383		0.021818	
	0.022724		0.022334	
NUMMINIS	0.008391		0.009426	
	0.073112		0.072747	
WENTONTERM		0.026959		0.023777
		0.024958		0.024456
WENTONMINI		0.00788		0.008269
		0.073112		0.077933
AGE	0.135993 0.007263	0.136064 0.007266	0.133855 0.007106	0.133895 0.007109
AGE2	-0.001276 8.37E-05	-0.001276 8.37E-05	-0.001247 8.17E-05	-0.001247 8.17E-05
COLGRADE	0.181667 0.025483	0.181523 0.025492	0.185966 0.024405	0.185902 0.024411
GRADDEGREE	0.036325 2.45E-02	0.036295 2.45E-02	0.03937 2.40E-02	0.039344 2.40E-02
HOMEWORKHRS	0.000797 0.00139	0.000805 0.001389		
MAJLANG	-0.050734 0.061134	-0.050283 0.061053	-0.03481 0.060148	-0.034355 0.060069
MAJONLYHUM	-0.232425 0.047243	-0.232635 0.047251	-0.221397 4.60E-02	-0.221592 4.60E-02
MAJONLYSOCSCI	-0.038648 0.03234	-0.039096 0.032339	-0.033164 3.15E-02	-0.033548 3.15E-02
MAJONLYSCI	0.01819 0.039069	0.017893 0.039066	0.025707 0.038091	0.025444 0.038089
MAJONLYENG	-0.07625 0.038837	-0.076567 0.03882	<i>-0.073682</i> 3.80E-02	<i>-0.07395</i> 0.037945
MAJONLYLANG	-0.312058 0.10391	-0.309548 0.103825	-0.312944 1.02E-01	-0.310709 0.102377
MAJONLYPROG	-0.022255 0.093399	-0.022502 0.0934	0.002968 0.090173	0.002673 0.090177
MAJOT	-0.246799 0.225545	-0.247447 0.225569	-0.231224 0.225086	-0.231727 0.22511

AFRICANAMER	0.001219	0.000499	-0.003909	-0.004556
	0.101457	0.101476	0.099312	0.099328
HISPANIC	-0.050599	-0.049213	-0.046321	-0.045044
	0.125372	0.125328	0.124593	0.124556
ASIAN	0.23641	0.236715	0.245949	0.246147
	0.099011	0.099022	0.09878	0.09879
MULTIRACIAL	0.01753	0.01714	0.023798	0.023424
	0.132808	0.132805	0.132535	0.132532
OTHEREACE	0.035035	0.034843	0.104859	0.104674
	0.144159	0.144158	0.139793	0.139791
FATHERCOLL	-0.013473	-0.013432		
	0.033456	0.033454		
MOTHERCOLL	-0.062329	-0.061907		
	0.04718	0.047178		
BOTHCOLL	-0.010635	-0.0106		
	0.027149	0.027147		
VARSITYYEARS	<i>0.009423</i>	<i>0.009407</i>	0.010264	0.010246
	0.004883	0.004882	0.004801	0.0048
GREEK	0.131059	0.131158	0.132821	0.132913
	0.029651	0.029653	0.029079	0.029081
FEMALE	-0.345404	-0.345513	-0.350135	-0.350166
	0.032177	0.032184	0.031525	0.03153
GREEK*FEMALE	-0.072604	-0.072732	<i>-0.078495</i>	<i>-0.078633</i>
	0.046538	0.046552	0.045621	0.045637
PERFORMYEARS	-0.017242	-0.017261	-0.017311	-0.017318
	0.006009	0.006008	0.005845	0.005844
PHYSICAL	0.079635	0.079649	0.084728	0.084744
	0.016187	0.016186	0.015827	0.015826
DRINKNIGHTS	0.052624	0.052546	0.051819	0.051747
	0.010636	0.010639	0.010357	0.010361
DRINKLEVEL	-0.011496	-0.011369	-0.008391	-0.008282
	0.018483	0.018482	0.01814	0.01814
R ²	0.386488	0.387684	0.385569	0.385567
N obs	2984	2984	3097	3097

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 4. More effects of study abroad on income

Dependent variable: Log(income)

	Coefficient (Std. Error)	Coefficient (Std. Error)
C	0.383268 0.187429	0.390822 0.187634
NUMTERMS	-0.051981 0.022223	
NUMMINIS	-0.053204 0.075709	
WENTONTERM		-0.05557 0.024497
WENTONMINI		-0.068055 0.081055
AGE	0.125731 0.007259	0.125403 0.007263
AGE2	-0.001094 8.31E-05	-0.00109 8.30E-05
COLGRADE	0.158368 0.024997	0.158425 0.025003
GRADDEGREE	<i>0.04301</i> 2.45E-02	<i>0.042868</i> 0.02446
AFRICANAMER	0.08329 0.103465	0.084195 0.103479
HISPANIC	0.04712 0.1273	0.044167 0.127288
ASIAN	0.253095 0.101731	0.252944 0.101745
MULTIRACIAL	0.035046 0.138286	0.036302 0.138289
OTHERRACE	0.123344 0.145915	0.12443 0.145921
VARSIITYEARS	0.011723 0.004975	0.011787 0.004974
GREEK	0.143289 0.023691	0.143248 0.023691
PERFORMYEARS	-0.019792 0.005994	-0.0198 0.005993
PHYSICAL	0.074325 0.016376	0.074349 0.016376

DRINKNIGHTS	0.063954	0.06407
	0.010715	0.010718
DRINKLEVEL	0.011982	0.011847
	0.018778	0.01878
R ²	0.326161	0.326115
N obs	3146	3146

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 5. Determinants of studying abroad

	Dependent variable: WENTONTERM		Dependent variable: WENTONMINI	
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
C	-1.916502 0.438207	-1.903391 0.405086	3.668488 2.302871	3.79138 2.234039
AGE	0.040796 0.017232	0.038444 0.016792	-0.37593 0.138507	-0.38734 0.13723
AGE2	-0.000842 0.000206	-0.000812 0.000201	0.004297 0.002183	0.004384 0.002171
COLGRADE	0.292913 0.058665	0.301871 0.057447	0.019868 0.185873	0.032828 0.181898
HOMEWORKHRS	0.006153 0.003125	0.006881 0.003068	0.030535 0.008595	0.028761 0.008451
MAJLANG	1.006355 0.143887	1.039221 0.14291	-0.99149 0.463499	-0.94005 0.454443
MAJONLYHUM	0.106841 0.1036	0.142122 0.101579	0.52303 0.249279	0.590859 0.241963
MAJONLYSOCSCI	0.013389 0.071034	0.030916 0.069427	0.210858 0.191887	0.21474 0.188156
MAJONLYSCI	-0.038154 0.087439	-0.011042 0.085577	-0.0284 0.260856	-0.08275 0.256915
MAJONLYENG	-0.279399 0.087631	-0.263969 0.086228	0.185605 0.257014	0.259834 0.250055
MAJONLYLANG	0.319768 0.263675	0.207152 0.254834		
MAJONLYPROG	0.30635 0.20504	0.307695 0.203453		
MAJOT	-0.19029 0.481465	-0.187275 0.480463	0.615265 0.737902	0.685857 0.724582
AFRICANAMER	0.440511 0.228395	0.474507 0.219877		
HISPANIC	0.404527 0.291239	0.4171 0.291069	0.432676 0.567271	0.414881 0.571845
ASIAN	-0.437714 0.222133	-0.440433 0.221934	0.454335 0.412029	0.355684 0.416157
MULTIRACIAL	-0.2256 0.296059	-0.310507 0.285348	0.564163 0.528489	0.448825 0.51096
OTERRACE	-0.414806 0.338331	-0.431771 0.333623	0.367796 0.70257	0.428095 0.701472

FATHERCOLL	<i>0.131593</i>	<i>0.13765</i>	0.108611	0.213958
	0.077601	0.076196	0.270342	0.262012
MOTHERCOLL	0.030304	0.047773	0.296389	0.408056
	0.107762	0.10534	0.302033	0.291261
BOTHCOLL	0.196522	0.215721	0.220449	0.27661
	0.061678	0.060434	0.201823	0.198576
VARSITYYEARS	-0.024184	-0.023047	-0.0051	-0.00386
	0.011035	0.010703	0.027258	0.026275
GREEK	-0.032559		-0.05959	
	0.069109		0.219877	
FEMALE	0.304011	0.324744	0.012974	0.293889
	0.070264	0.053461	0.220431	0.149109
GREEK*FEMALE	0.026804		0.429092	
	0.102412		0.285413	
PERFORMYEARS	0.019659	<i>0.021385</i>	0.02891	0.027707
	0.013207	0.012936	0.038876	0.037929
PHYSICAL	0.013337		0.022914	
	0.03671		0.105912	
DRINKNIGHTS	0.052549	0.057979	0.039007	0.051454
	0.024055	0.023429	0.073158	0.068937
DRINKLEVEL	0.013976	-0.00152	0.239352	0.251196
	0.041898	0.041067	0.112057	0.109817
STEADYREL	-0.107693	-0.102394	-0.03924	-0.02012
	0.050295	0.048766	0.138524	0.133421
N obs	3198	3319	1711	1777
McFadden R ²	0.158778	0.158305	0.242788	0.241789

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 6. First-stage regression results

Dependent variable: WENTONTERM

	Without pctabroad	All 9 instruments	First set only	First less pctabroad
C	-1.643032	-2.551046	-2.883896	-1.751476
	0.504541	0.864279	0.84209	0.4938
AGE	0.017218	0.050455	0.064788	0.021648
	0.012409	0.026657	0.025852	0.012077
AGE2	1.18E-05	-0.000312	-0.000451	-2.57E-05
	0.000105	0.000247	0.000239	0.000102
COLGRADE	0.080856	0.088376	0.086772	0.08026
	0.01869	0.021154	0.020318	0.017808
GRADDEGREE	0.001469	0.000585	0.002543	0.003081
	0.017943	0.019947	0.019492	0.017515
MAJLANG	0.335946	0.322319	0.33529	0.347886
	0.044145	0.047367	0.046671	0.043466
MAJONLYHUM	0.038054	0.029602	0.044389	0.048661
	0.034551	0.038531	0.037363	0.033578
MAJONLYSOCSCI	-0.001023	-0.015757	-0.014318	-0.003894
	0.023716	0.026152	0.025459	0.023046
MAJONLYSCI	-0.007594	-0.000403	0.007998	-0.004683
	0.028599	0.031821	0.031175	0.027847
MAJONLYENG	-0.096469	-0.104048	-0.097268	-0.093714
	0.028414	0.031569	0.030901	0.027713
MAJONLYLANG	0.115099	0.048147	0.044231	0.118005
	0.075722	0.087409	0.08723	0.074852
MAJONLYPROG	0.076221	0.110695	0.125532	0.097705
	0.068188	0.08188	0.080582	0.065993
MAJOT	0.035619	0.052961	0.059453	0.043121
	0.164717	0.181163	0.181339	0.164712
AFRICANAM	0.136817	0.153622	0.124969	0.110366
	0.073987	0.082477	0.080818	0.072546
HISPANIC	0.135479	0.182686	0.163047	0.121158
	0.093301	0.099985	0.097299	0.090991
ASIAN	-0.1572	-0.146106	-0.142113	-0.155476
	0.072194	0.073677	0.073675	0.072143
MULTIRACE	-0.076507	-0.102371	-0.094187	-0.072018
	0.096976	0.106972	0.107023	0.096874
OTHERRACE	-0.127121	-0.168669	-0.197902	-0.151581
	0.105207	0.122778	0.118302	0.102237
VARSITYYEARS	-0.008341	-0.007708	-0.008356	-0.009173

	0.003566	0.003854	0.003797	0.003505	
GREEK	0.008911	-0.005702	-0.013685	-0.000606	
	0.02201	0.025261	0.024711	0.021508	
FEMALE	0.121024	0.114316	0.10801	0.112349	
	0.02355	0.027024	0.026451	0.022986	
GREEK*FEMALE	0.006814	0.033133	0.052226	0.030311	
	0.034098	0.03768	0.036947	0.033359	
PERFORMYEARS	0.008101	0.00555	0.00632	0.007615	
	0.004417	0.004997	0.00484	0.004272	
PHYSICAL	-0.002442	0.001735	-0.002515	-0.005219	
	0.011983	0.013597	0.01316	0.011582	
DRINKNIGHTS	0.019723	0.019339	0.022716	0.022478	
	0.007771	0.008878	0.008653	0.00756	
DRINKLEVEL	-0.004126	0.006244	0.001539	-0.008258	
	0.01354	0.015227	0.014903	0.013249	
FATHERCOLL	0.03464	0.046833			
	0.024456	0.027831			
MOTHERCOLL	0.010128	0.02209			
	0.034513	0.038808			
BOTHCOLL	0.061116	0.066381			
	0.019868	0.022376			
HOMEWORKHRS	0.001131	0.000856			
	0.001016	0.001145			
STEADYREL	-0.037154	-0.048135			
	0.016281	0.01822			
PCTABROAD		28.15758	35.31376		
		19.33703	18.86401		
PCTFH	11.8536	10.40418	10.51062	13.41498	
	4.715805	7.116986	7.006915	4.597312	
PERCENTGOING	1.289194	1.325214	1.240535	1.199769	
	0.207553	0.216445	0.212664	0.203645	
AVAILABLE	0.005592	0.002583	0.004681	0.007816	
	0.00735	0.008009	0.007853	0.007188	
R ²	0.2153	0.2113	0.2052	0.2107	
N Obs	2957	2451	2560	3097	
F-test to exclude instruments:	14.95	11.95	22.3	33.73	F-stat
	0	0	0	0	P-value

Table 7. Effects of studying abroad on income
Instrumental variables estimates

Dependent variable: Log(INCOME)

	All 9 instruments	Without pctabroad	First set only	First set less pctabroad
C	0.431548	0.480099	0.417274	0.474985
	0.195724	0.190222	0.190594	0.185331
WENTONTERM	-0.095902	-0.048495	-0.091557	-0.061972
	0.126243	0.125496	0.138204	0.136293
AGE	0.136843	0.136699	0.134323	0.133862
	0.007307	0.007192	0.00713	0.007024
AGE2	-0.001294	-0.001293	-0.001258	-0.001256
	8.48E-05	8.39E-05	8.33E-05	8.26E-05
COLGRADE	0.21215	0.187666	0.216744	0.19306
	0.029449	0.027161	0.0292	0.026829
GRADDEGREE	0.014127	0.03787	0.019348	0.039696
	0.025993	0.024575	0.025373	0.023996
MAJLANG	0.035342	-0.023798	0.040815	-0.00518
	0.074039	0.073796	0.076177	0.075778
MAJONLYHUM	-0.21417	-0.232079	-0.206473	-0.217455
	0.050429	0.047543	0.049153	0.046486
MAJONLYSOCSCI	-0.030757	-0.036531	-0.033749	-0.033784
	0.034092	0.032472	0.033231	0.031586
MAJONLYSCI	0.001713	0.020075	-0.004241	0.024642
	0.041543	0.039218	0.040664	0.03818
MAJONLYENG	-0.07544	-0.08531	-0.071576	-0.081087
	0.042753	0.040308	0.042045	0.039643
MAJONLYLANG	-0.260528	-0.307905	-0.26481	-0.301823
	0.114388	0.10449	0.113915	0.103472
MAJONLYPROG	-0.087421	-0.015303	-0.099616	0.008801
	0.107614	0.093631	0.10617	0.090865
MAJOT	-0.208197	-0.242159	-0.202618	-0.228946
	0.236476	0.225571	0.236249	0.22541
AFRICANAM	0.059681	0.012371	0.047229	0.005739
	0.108894	0.102306	0.106998	0.100845
HISPANIC	-0.032877	-0.038923	-0.028177	-0.035185
	0.131456	0.128178	0.12889	0.125741
ASIAN	0.212825	0.222817	0.224006	0.232213
	0.098219	0.10108	0.098521	0.101381

MULTIRACE	-0.063816	0.016718	-0.061313	0.017698
	0.140091	0.133079	0.140078	0.133089
OTHERRACE	0.095268	0.024964	0.177368	0.090664
	0.162195	0.145306	0.157228	0.141807
VARSITYYEARS	0.007618	0.008753	0.008513	0.009401
	0.005167	0.005032	0.005117	0.004985
GREEK	0.13878	0.132429	0.13665	0.131972
	0.032874	0.029786	0.032324	0.029165
FEMALE	-0.331505	-0.338599	-0.335181	-0.340351
	0.037965	0.035651	0.037545	0.035126
GREEK*FEMALE	-0.06991	-0.072917	-0.070853	-0.076531
	0.049385	0.046649	0.048637	0.045744
PERFORMYEARS	-0.013463	-0.01623	-0.013575	-0.016749
	0.006562	0.006132	0.006353	0.005919
PHYSICAL	0.073511	0.079148	0.078092	0.084478
	0.017601	0.016277	0.017141	0.015857
DRINKNIGHTS	0.059793	0.052187	0.061727	0.053769
	0.011809	0.010903	0.011747	0.010854
DRINKLEVEL	-0.021974	-0.015152	-0.015708	-0.008895
	0.019884	0.018575	0.019448	0.018196
R ²				0.383
N obs	3097	2451	3097	2451

Table 8. Effect of study abroad for full-time workers

Dependent variable: Log(income)

	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
C	0.098462 0.206956	0.092871 0.207204	0.07765 0.200623	0.072446 0.20087
NUMTERMS	0.036181 0.023839		0.036142 0.023362	
NUMMINIS	0.022238 0.075846		0.021059 0.075342	
WENTONTERM		0.041387 0.026067		0.041218 0.025473
WENTONMINI		0.02882 0.082467		0.027553 0.08194
AGE	0.142775 0.008057	0.143074 0.008065	0.141052 0.007883	0.141332 0.00789
AGE2	-0.001319 9.41E-05	-0.001322 9.42E-05	-0.001297 9.19E-05	-0.0013 9.19E-05
COLGRADE	0.223574 0.027072	0.223086 0.027085	0.22254 0.025777	0.2221 0.025786
GRADDEGREE	-0.000595 2.61E-02	-0.000794 0.026094	0.002404 0.025532	0.002232 0.025524
HOMEWORKHRS	-0.000266 0.001493	-0.000259 0.001492		
MAJLANG	-0.038229 6.59E-02	-0.037347 0.065802	-0.025157 0.064523	-0.024364 0.064393
MAJONLYHUM	-0.23969 0.050382	-0.24032 0.050386	-0.22678 0.049072	-0.227366 0.049078
MAJONLYSOCSCI	-0.007695 0.034023	-0.008682 0.034013	0.003896 0.033096	0.002963 0.033084
MAJONLYSCI	0.029182 0.041289	0.028279 0.041278	0.040566 0.040191	0.039668 0.040182
MAJONLYENG	-0.060589 0.040689	-0.061386 0.040653	-0.056864 0.039647	-0.057602 0.039616
MAJONLYLANG	-0.264653 0.114096	-0.263327 0.114069	-0.258444 0.11185	-0.257166 0.111824
MAJONLYPROG	0.046506 0.104684	0.046029 0.104683	0.064351 0.099666	0.06364 0.099669
MAJOT	-0.148684 0.252402	-0.149665 0.252432	-0.135665 0.251158	-0.136614 0.251189

AFRICANAMER	-0.026667	-0.027728	-0.036368	-0.037388
	0.102036	0.10205	0.099332	0.09934
HISPANIC	-0.052688	-0.050476	-0.049347	-0.047039
	0.13093	0.130843	0.129684	0.129611
ASIAN	0.160607	0.160183	0.170599	0.170123
	0.109144	0.10914	0.108646	0.108642
MULTIRACIAL	0.16221	0.162062	0.168047	0.167844
	0.145064	0.145059	0.144441	0.144436
OTHERRACE	0.096584	0.09616	0.103953	0.103503
	0.140788	0.140783	0.14009	0.140084
FATHERCOLL	-0.014891	-0.014818		
	0.03579	0.035783		
MOTHERCOLL	-0.047451	-0.046773		
	0.049582	0.04957		
BOTHCOLL	-0.013278	-0.013399		
	0.028618	0.028615		
VARSITYYEARS	0.010448	0.010462	0.011176	0.011188
	0.005051	0.005051	0.004957	0.004956
GREEK	0.148042	0.148141	0.149742	0.14985
	0.030569	0.030569	0.029926	0.029926
FEMALE	-0.266042	-0.266499	-0.271098	-0.271491
	0.034265	0.03428	0.033498	0.033509
GREEK*FEMALE	-0.075674	-0.076065	-0.078697	-0.079173
	0.049831	0.049859	0.048796	0.048826
PERFORMYEARS	-0.018392	-0.018413	-0.018394	-0.01841
	0.006345	0.006343	0.006164	0.006162
PHYSICAL	0.099094	0.099088	0.105394	0.105388
	0.017038	0.017036	0.016683	0.016682
DRINKNIGHTS	0.057337	0.057245	0.057416	0.057307
	0.01126	0.011261	0.010933	0.010934
DRINKLEVEL	-0.018528	-0.018527	-0.016286	-0.016292
	0.01965	0.019648	0.019216	0.019214
R ²	0.428813	0.428866	0.429452	0.429505
N obs	2403	2403	2486	2486

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 9. Effect of study abroad on working full time

Dependent variable: WORKFULL

	Coefficient (Std. Error)	Coefficient (Std. Error)
C	-0.722435 0.494729	-0.678127 0.392915
WENTONTERM	0.001096 0.066872	0.010202 0.061265
WENTONMINI	-0.056687 0.199342	-0.021561 0.195332
AGE	0.101644 0.01874	0.108248 0.01685
AGE2	-0.001493 0.000215	-0.001562 0.000193
COLGRADE	0.122875 0.066326	0.097311 0.059053
HOMEWORKHRS	-0.00193 0.003607	
GRADDEGREE	0.119817 0.063802	0.085188 0.059731
MAJLANG	-0.160718 0.150042	
MAJONLYHUM	0.018054 0.121105	
MAJONLYSOCSCI	-0.006335 0.085022	
MAJONLYSCI	0.051981 0.102898	
MAJONLYENG	0.035602 0.104668	
MAJONLYLANG	0.26621 0.255066	
MAJONLYPROG	-0.144566 0.225719	
MAJOT	-0.271086 0.496006	
AFRICANAMER	0.235896 0.294819	0.12487 0.263438
HISPANIC	-0.178647 0.317305	-0.131029 0.311408

ASIAN	<i>-0.43152</i>	-0.506145
	0.231751	0.220145
MULTIRACIAL	-0.166594	-0.05059
	0.340686	0.320801
OTHERRACE	0.676892	0.357711
	0.506688	0.399225
FATHERCOLL	-0.102201	
	0.085467	
MOTHERCOLL	0.041612	
	0.124524	
BOTHCOLL	0.008423	
	0.071645	
VARSITYYEARS	<i>0.021903</i>	0.026418
	0.013308	0.012473
GREEK	0.019506	
	0.083067	
FEMALE	-0.639761	-0.694076
	0.084816	0.062979
GREEK*FEMALE	-0.144195	
	0.11947	
PERFORMYEARS	0.009573	
	0.015863	
PHYSICAL	0.004551	
	0.04253	
DRINKNIGHTS	0.025102	
	0.028258	
DRINKLEVEL	0.024085	
	0.048716	
N obs	2932	3231
McFadden R ²	0.091631	0.083674

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 10. Effect of terms abroad on income by gender

Dependent variable: Log(income)

	Whole sample		Full-time workers	
	Women Coefficient (Std. Error)	Men Coefficient (Std. Error)	Women Coefficient (Std. Error)	Men Coefficient (Std. Error)
C	0.927544 0.356467	-0.11719 0.237922	0.032116 0.389415	-0.066921 0.25507
WENTONTERM	0.041891 0.035563	0.014959 0.033349	0.089345 0.03799	0.011147 0.033857
WENTONMINI	0.067926 0.097113	-0.095485 0.127439	0.115184 0.100646	-0.100293 0.133913
AGE	0.130293 0.015146	0.147874 0.009218	0.16131 0.016547	0.138787 0.010113
AGE2	-0.001278 0.000192	-0.001384 0.000102	-0.0016 0.000211	-0.001264 0.000115
COLGRADE	0.029052 0.043713	0.242149 0.029649	0.079234 0.045947	0.27377 0.031696
GRADDEGREE	-0.01169 0.037013	0.067777 0.031431	-0.020518 0.039122	0.014024 0.03348
MAJLANG	-0.036324 0.071777	-0.062677 0.112139	-0.030344 0.075789	-0.018712 0.118726
MAJONLYHUM	-0.242435 0.063752	-0.213501 0.065454	-0.217736 0.067412	-0.244625 0.06976
MAJONLYSOCSCI	-0.067398 0.047655	-0.01904 0.041763	0.0049 0.050143	-0.004321 0.043668
MAJONLYSCI	-0.03593 0.059479	0.039819 0.049499	0.001101 0.063377	0.04266 0.051934
MAJONLYENG	0.000308 0.069831	-0.090033 0.046727	0.040439 0.073325	-0.083489 0.0489
MAJONLYLANG	-0.272541 0.114179	-0.486671 0.21603	-0.227555 0.122572	-0.391042 0.231588
MAJONLYPROG	0.033847 0.126455	-0.019345 0.126935	0.035247 0.134753	0.102952 0.143663
MAJOT	-0.101012 0.290049	-0.39629 0.346605	0.068627 0.307396	-0.385796 0.406808
AFRICANAMER	0.283525 0.170876	-0.179279 0.122188	0.349069 0.180672	-0.196618 0.119891
HISPANIC	-0.204827 0.219644	0.032881 0.150813	-0.172433 0.238526	0.00311 0.1551

ASIAN	0.179885	0.256073	0.026602	<i>0.30193</i>
	0.125664	0.155701	0.138473	0.166723
MULTIRACIAL	-0.33918	0.206452	-0.158259	<i>0.314993</i>
	0.218626	0.166622	0.237831	0.181811
OTHERRACE	0.267128	-0.014635	0.032322	0.145208
	0.218685	0.180579	0.217273	0.181954
VARSITYYEARS	0.004005	0.014836	0.002048	0.017822
	0.007207	0.006454	0.007418	0.006656
GREEK	0.018151	0.133665	0.047526	0.149274
	0.037227	0.030328	0.039619	0.031606
PERFORMYEARS	-0.012123	-0.01984	-0.015249	-0.019586
	0.009866	0.007257	0.010305	0.007718
PHYSICAL	0.081072	0.092183	0.110849	0.101986
	0.025051	0.020614	0.026976	0.021501
DRINKNIGHTS	0.048298	0.051308	0.066095	0.05606
	0.018332	0.012594	0.020135	0.013165
DRINKLEVEL	-0.029045	-3.08E-05	-0.064158	3.25E-06
	0.029882	0.02294	0.032353	0.024129
R ²	0.269303	0.320469	0.380718	0.350763
N obs	1179	1918	881	1605

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 11. Effect of terms abroad on income by major

Dependent variable: Log(income)

	Humanities Coefficient (Std. Error)	Social Scis Coefficient (Std. Error)	Sciences Coefficient (Std. Error)	Engineers Coefficient (Std. Error)	X-division Coefficient (Std. Error)
C	0.853878 0.614777	0.389141 0.304842	0.334241 0.480301	1.292939 0.439772	-0.220345 0.413209
WENTONTERM	-0.021313 0.077339	0.021995 0.039997	0.053019 0.065027	0.021331 0.065882	-0.016486 0.050485
WENTONMINI	-0.116083 0.225977	-0.006129 0.124319	-0.060111 0.237921	-0.162249 0.207896	0.185685 0.16995
AGE	0.111991 0.024237	0.124094 0.012006	0.134398 0.018709	0.101151 0.018065	0.180504 0.015431
AGE2	-0.001047 0.000277	-0.001133 0.000138	-0.001223 0.000209	-0.000905 0.000206	-0.001806 0.000182
COLGRADE	0.095458 0.083697	0.261788 0.041706	0.185976 0.067002	0.169216 0.050645	0.1291 0.05751
GRADDEGREE	0.059762 0.082652	-0.013422 0.039887	0.210947 0.07337	0.108266 0.052787	-0.004047 0.053124
AFRICANAMER	0.813726 0.597669	0.20937 0.137741	-0.146912 0.270774	-0.317365 0.280878	-0.567159 0.24369
HISPANIC	0.472381 0.603752	0.150356 0.177697	-0.356895 0.425503	-0.129779 0.253204	-0.404152 0.336663
ASIAN	-0.022794 0.304794	0.329356 0.216207	0.507378 0.24905	0.238161 0.220244	0.173895 0.172528
MULTIRACIAL	0.228786 0.302585	0.341647 0.230384	-0.536937 0.604069	-0.445832 0.394888	-0.319898 0.239122
OTHERRACE	-0.110179 0.426615	0.120695 0.230247	-0.515119 0.347603	0.546692 0.396287	0.512683 0.341829
VARSITYYEARS	0.015047 0.016966	0.021544 0.008474	0.001612 0.012845	0.006056 0.010785	0.0003 0.009651
GREEK	0.340151 0.111263	0.072826 0.049104	0.118343 0.072801	0.162303 0.061215	0.210673 0.06785
FEMALE	<i>-0.20399</i> 0.104555	-0.414267 0.055167	-0.344925 0.078798	-0.252213 0.080242	-0.33052 0.068136
GREEK*FEMALE	-0.308063 0.149253	-0.0067 0.078189	-0.167972 0.132485	-0.056857 0.131045	-0.134749 0.094612
PERFORMYEARS	-0.018411 0.013728	-0.026146 0.011681	-0.002858 0.019374	-0.005743 0.015705	<i>-0.018379</i> 0.010525
PHYSICAL	0.09925	0.093062	<i>0.074274</i>	0.001339	0.108615

	0.048624	0.02697	0.042507	0.037488	0.034163
DRINKNIGHTS	0.081199	0.077462	0.099384	-0.004564	0.017102
	0.035395	0.017499	0.030369	0.022374	0.021752
DRINKLEVEL	-0.036942	-0.036349	<i>-0.084402</i>	0.120976	-0.005199
	0.060206	0.031331	0.048835	0.040683	0.039136
R ²	0.366771	0.371731	0.46142	0.274561	0.45248
N Obs	292	1142	462	501	646

Estimates in **bold** are significant at the 5% level; in *italics*, 10% level

Table 12. Effect of terms abroad on income by cohort

Dependent variable: Log(income)

	1965-1979	1980-1994	1995-2008
	Coefficient	Coefficient	Coefficient
	(Std. Error)	(Std. Error)	(Std. Error)
C	4.450995	3.178606	1.564209
	0.437769	0.298195	0.215859
WENTONTERM	0.065777	0.034351	0.0499
	0.061536	0.042118	0.030994
WENTONMINI		-0.108825	0.003598
		0.448679	0.064935
AGE	-0.011403	0.015732	0.06924
	0.006296	0.004684	0.004004
COLGRADE	0.224264	0.226412	0.04265
	0.043795	0.045173	0.038156
GRADDEGREE	0.196876	0.012432	-0.052232
	0.051843	0.043638	0.031553
MAJLANG	0.052278	-0.058561	-0.053555
	0.2054	0.108646	0.067201
MAJONLYHUM	-0.17553	-0.302166	-0.168243
	0.092747	0.086676	0.06086
MAJONLYSOCSCI	0.038071	-0.152367	0.042921
	0.068987	0.054818	0.04181
MAJONLYSCI	0.165682	-0.082029	-0.034865
	0.07528	0.072381	0.052515
MAJONLYENG	0.000748	-0.176245	0.080187
	0.080423	0.061097	0.058243
MAJONLYLANG	-0.47844	-0.420106	-0.105508
	0.246971	0.196006	0.139669
MAJONLYPROG	0.304478	-0.606183	-0.081248
	0.137553	0.231258	0.141425
MAJOT	-0.3852	-0.616771	0.077428
	0.459197	0.634933	0.239709
AFRICANAMER	0.143429	-0.294687	0.013893
	0.232611	0.213926	0.11082
HISPANIC	-0.09232	-0.213461	-0.05971
	0.372439	0.447003	0.114948
ASIAN	0.141315	0.300221	0.159933
	0.645392	0.194505	0.09776
MULTIRACIAL	0.56734	-0.215736	-0.158326

	0.289258	0.285493	0.150517
OTHERRACE	<i>-0.486058</i>	0.450565	0.377394
	0.263605	0.286249	0.180686
VARSITYYEARS	0.011792	<i>0.015815</i>	0.006797
	0.011322	0.008775	0.005976
GREEK	0.12191	0.19841	0.028746
	0.053252	0.054949	0.045886
FEMALE	-0.41279	-0.38483	-0.203188
	0.068689	0.056316	0.044697
GREEK*FEMALE	<i>-0.029206</i>	-0.22289	<i>-0.004206</i>
	0.298087	0.081209	0.060153
PERFORMYEARS	-0.024421	<i>-0.011736</i>	<i>-0.010203</i>
	0.010937	0.010248	0.008913
PHYSICAL	<i>0.057388</i>	0.101997	0.101398
	0.032241	0.028281	0.021914
DRINKNIGHTS	0.053164	0.050892	0.058515
	0.020384	0.017845	0.015432
DRINKLEVEL	<i>-0.007749</i>	<i>-0.035939</i>	0.007699
	0.037176	0.032646	0.02472
R2	0.1844	0.208265	0.338465
N Obs	914	1108	1075

Estimates in bold are significant at the 5% level; in italics, 10% level