Lost in Translation?
The Difficulty in Identifying Foreign Talent

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In an increasingly globalized world, firms with high-skilled jobs often search world-wide for the best talent. Whereas identifying talent and the correct firm-employee fit is difficult and expensive under any circumstance, hiring foreign workers complicates the task of evaluating individual's skill sets (both cognitive and non-cognitive abilities) and their match with company and industry standards and with cultural norms. Aside from any potential language barriers, foreign high school and college transcripts, extracurricular activities, and work experience or internships can be difficult to compare with the pool of domestic applicants or existing employees. Similarly, letters of recommendation, which have proven to poorly predict job success, are even harder to judge due to differences in language and distinct cultural practices. Although some multinational corporations are able to use internal company standards to evaluate intra-company transferees, in general, foreign applicants limit the use of social or professional network connections, namely referrals by family members, friends or work associates. In essence, then, it is harder for an American IT firm to size up an engineering graduate from the Peking University that from Purdue.

The goal of this paper is to use a pool of applicants to a high stakes training program in 1989 with a standardized set of selection criteria in order to evaluate what factors determine their career outcomes 17 years later. Since roughly half the applicants had U.S. and half had foreign baccalaureate degrees, we analyze the determinants and differences that emerge for each group in the selection process into training programs, for achievement in the training program, and, ultimately, for career success.

To analyze the differences U.S. selection committees face in identifying foreign versus domestic talent we use applicants to a top five economics Ph.D. program in 1989 (N=344). Admission committee members must judge students' potential economics talent (e.g., their

preparation, aptitude, drive, and creativity) based on the uniform evidence provided in the application folders: standardized test scores, the course selection and grades provided in transcripts, the quality of the undergraduate institution, fellow economists' evaluations of their potential economics talent, and any other relevant information. Due to the non-observability of important characteristics, the admission committee's task of matching opportunity with talent constitutes a signaling problem, as modeled by Spence (1973). Applicants with foreign undergraduate degrees, though, send "nosier" signals of their potential ability. Note the stark differences between U.S. and foreign baccalaureates, respectively: 42 versus 16 percent had globally-ranked research economists write them a letter of reference; 14 versus less than 1 percent graduated from one of the top research universities in the world; and of those who ultimately published in the four premier economics journals, 80 versus 20 percent had a reference letter from a globally-ranked research economist. Apparently, then, the signals used by economics Ph.D. admission committees provide considerably less help identifying economics talent for those educated outside U.S. borders. This constitutes a considerable problem since non-U.S. citizens received 68 percent of the economics doctorates awarded in 2003 (Hoffer et al., 2005, p. 98).

II. Data

Our main sample consists of all 344 applicants to a particular top 5 economics PhD program in 1989. For each of these applicants, we were able to obtain information on several relevant predictor variables from summaries of the applicants' admissions files. Most importantly, we were able to obtain data on the applicants' age, gender, country of origin, undergraduate college, other graduate degrees obtained, and Quantitative and Verbal GRE scores. For a subset of

applicants, we also had the Analytical and Economics Subject GRE score. In addition, most of the application folders were read by two members of an admissions committee, and we use the sum of their rating scores as a variable in some of the analysis that follows. Unfortunately, some pertinent information was not retained in the department's files, such as the students' undergraduate GPA, relevant coursework, and letters of references. The folders did list the name of the applicants' reference writers, however, so we categorized the letter of references into three admittedly subjective groups: (1) at least one reference writer was a prominent research economist (i.e., someone who we deemed to be a well-known and respected researcher in the profession); (2) at least one was an active economist (i.e., an economist who had published in the not too distant past or was known for other reasons); and (3) the reference writers were unknown to us.[1]

In order to study the success of these applicants, we use a number of outcome measures including whether or not the person received finished a doctoral degree, the initial job placement, and the publication record. Initial job placements were obtained through internet searches and combing through vitaes available through the web. To obtain an objective measure of research productivity, we look at the total number of refereed journal publications and a quality weighted index of publications (as weighted by the Laband-Piette index of journal quality). Publication information was obtained from the EconLit database in July 2006.

In order to better understand the enrollment decisions, the graduate school experiences, and the career paths of these individuals, in the summer of 2006 we conducted a follow-up survey for as many of the 344 applicants for whom we could obtain valid addresses or e-mails. In the end, we were able to track down the whereabouts of approximately 300 of the original applicants, and we

[1]These groups were mutually exclusive. References writers could only be classified in group 2 if they were not in group 1. Also note that we classified the reference writers without knowing the name or placement of the applicant.

received a total of 160 responses to the follow-up survey. This survey asked questions about applications to other graduate schools, admission and funding offers received, the graduate school attended, teaching and research experience during graduate school, experience with their advisors, job history, tenure decisions (for academics), and salary. We were also able to obtain information from some of the individuals who did not complete the survey, but had c.v.'s available on the Internet. In our study, we analyze both the smaller sample of 160 respondents as well as the fuller sample of all applicants to the top 5 program.

In addition to understanding the effects of pre-graduate school characteristics on various measures of academic and career success, we also test how strongly these outcomes are predicted by experiences during graduate school, including the prestige of graduate program, the level of research activity of the advisor, and funding sources during graduate school. To rank economics doctoral programs, we use the National Research Council's (1995) ranking of Ph.D.-granting economics programs in 1993. Our multi-tier ranking designates Tier 1 programs (Chicago, Harvard, MIT, Stanford and Princeton) as those that exceeded the mean ranking by two standard deviations, the Tier 2 schools (6-10) by 1 and a half standard deviations, the Tier 3 schools (11-18) by a standard deviations, and the Tier 4 schools (the remainder).[2]

We create indicator variables for applicants who completed their undergraduate degrees at a top ten economics Ph.D. programs, using Kalaitzidakis et al.'s (2003) top 200 global economics programs. We include the quality of the undergraduate institution attended as a predictor of long run career success. 18 percent of respondents received their baccalaureates from a top research university. We rank dissertation advisors with Coupe's (2003) list of the top 1000 economists in

[2] Schools ranked 19-30 exceeded the mean by half a standard deviation but too few of the individuals in our sample attend that group to include it separately. Note that the NRC ranking used by others, such as Siegfried and Stock (2001), include more schools in each tier so that the top four tiers contain 57 institutions compared to merely 18 for

the world, a weighted average of eleven different measures of research productivity. We define a dichotomous variable that is equal to one if the advisor is ranked among the top 1,000 economists in the world according to Coupe's list.

Finally, we rank initial job placement using Christian Roessler's econphd.net rankings of 433 economics research institutions based on "equivalent papers," which takes into account the number and length of articles published (http://www.econphd.net/rank/rallec.htm as of Sept. 2006). Universities are ranked 1 to 321 and other organizations from 1 to 112, and following Oyer's (2006) approach of coding the universities as 1 to 321, other organizations' as their rank times 2 plus 50, and then all others coded as 350. For example, the top non-academic institution, the World Bank, has a non-academic ranking of 1 and an adjusted ranking of 52 (1*2 = 50) which positions it as comparable to having a job at Rutgers University.

III. Pre-Graduate School Selection: Admission and Funding

The crucial task of the Ph.D. selection process is to match opportunities with talent. Since Ph.D. programs offer among the longest training programs, selecting the most likely applicants to succeed is important for the efficient allocation of valuable student, faculty and school resources.[3] Graduate school admission committees seek candidates who have a portfolio of skills, aptitudes and drive that will enable them to excel in the program, get good jobs, and ultimately enrich the field. We measure applicants' success in Ph.D. program admission in two ways: according to the program attended (N=301) and with an admission index, essentially a summary of market predictions of applicants' expected economics talent (N=145). Although our

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our top 3 tiers. Our Tier 2 schools include Yale, Berkeley, Pennsylvania, Northwestern and Minnesota and Tier 3 consist of UCLA, Columbia, Michigan, Rochester, Wisconsin, San Diego, NYU and Cornell.

[3] Many professions and jobs require extensive training programs; examples include the U.S. military's basic training

population comprises applicants to a single top-5 economics Ph.D. program, those individuals attended 42 different programs, of which 16 students attended 8 programs in 4 foreign countries.

The Quality of the Ph.D. Program Attended

We know the economics doctoral program attended by 301, or 87.5 percent, of the applicants and use an ordered probit model to estimate the determinants of these count variables outcomes (four Ph.D. program tiers with tier 5, the lowest tier, for those who did not attend a program at all).[4] Regarding foreign students, both Attiyeh and Attiyeh (1997) found that admission committees gave a substantial preference for U.S. citizens over most foreign applicants. By contrast, we find that applicants from foreign undergraduate school attended more highly ranked Ph.D. programs, controlling for GRE scores, demographic variables, having a prior graduate degree, and the quality of the reference letter writers and of the undergraduate institution (see Table 2, column 1). In fact, U.S. undergraduates on average attended lower ranked programs (mean program rank of 16.9) than did foreign baccalaureates (mean rank of 25.1—see Table 1).

According to studies by Ault, (1979 and 1983) and Eider, Brewer, and Ehrenberg (1998), having graduated from an elite undergraduate institution influenced the quality of the graduate program attended. Our results indicate no such relationship for the entire sample or for applicants from U.S. universities. For foreign baccalaureates, though, the quality of the undergraduate institution does improve the tier of the doctoral program attended.

As shown in Table 2, among both U.S. and foreign baccalaureate applicants, those who had either a Reference 1 or 2 writer and had higher quantitative GRE scores is associated with

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program and the residency and training programs of the medical and dental professions.

[4] For those without Ph.D.s, we learned what program they attended either from their survey or, for applicants without survey data, we obtained this information from the doctoral programs. Note that we do not know whether

attending a higher ranked Ph.D. program (columns 2 and 3). Note that applicants from universities abroad benefited about 50 percent more from having a Reference 1 writer than did those from U.S. institutions. For applicants from American universities, females and those with a prior graduate degree enrolled in more prestigious doctoral programs. By contrast, foreign baccalaureates' program quality placement was strongly positively associated with higher verbal GRE scores and graduating from a top global economics department (but not with having a graduate degree or being female). Interestingly, the specification with the U.S. undergraduate sub-population explains considerably more of the variation in the tier attended (12 percent) as does the same analysis for either all or only the foreign baccalaureate applicants (8 and 7 percent, respectively).

Admission Score

From the self-reported survey data of the Ph.D. programs applied to and the respective acceptances, we create a summary of market predictions of applicants' expected economics talent, i.e., an admission index. While few individuals attend a significantly lower ranked program due to funding differences, there still may be instances where financial considerations influence the program that they ultimately attend. To obtain a broader measure of graduate admissions success, we calculate an admission score index that is based on two components: the rank of the economics program to which they are admitted, and the funding they are given. Obviously, there are numerous ways that one could calculate an index of admission success, but our results are not sensitive to the way this is constructed.[5] From the follow-up survey, we calculate U.S. baccalaureates to have an admission index of 837 versus 716 for the overall mean and 587 for undergraduates from aboard (see Table 1).

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43 of the applicants ever began a Ph.D. program since some doctoral programs did not answer our query.

[5] In particular, we re-calculate this index using different criteria, such as only giving weight to admission to top 10 or top 20 ranked programs, and averaging the index based on the number of schools applied to. Results are

We evaluate the determinants of applicants' admission index as a function of the ex ante application information with an OLS regression. As shown in Table 2, higher verbal and quantitative GRE scores and letters of reference from globally-ranked economists significantly improved applicants' admission scores, whereas applicants age 25 and over obtained worse overall outcomes (column 4). Analysis by baccalaureate-granting location indicates that for foreign undergraduates, higher verbal GRE scores strongly predicted admission success, though reference writers are no longer significant. For U.S. undergrads, quantitative GRE and Reference 1 writers only weakly predict an aggregate measure of the quality of Ph.D. admission options (columns 5).

Thus, in their global search for top economics talent graduate admission committees appear to have relied upon different signals of potential economics talent for applicants with a U.S. versus a foreign baccalaureate. Having a letter from a well-known economist is a predictor of admissions success for both foreign and U.S. undergrads, but math aptitude (as evidenced by the quantitative GRE) is more important for students U.S. institutions while verbal aptitude is more important for foreign undergraduates.

IV. Graduate School Outcomes: Advisors, Completion and Time-to-Degree

The two-sided nature of graduate school enrollment consists of a search by schools for the applicants perceived to have the most "economics talent" and by students seeking the program that will offer them the most potential for career achievement. One of the principal benefits of enrolling in a highly ranked Ph.D. program was having a top global researcher for a dissertation advisor.

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qualitatively similar.

Advisor

We rank dissertation advisors with Coupe's (2003) list of the top 1000 economists in the world, a weighted average of eleven different measures of research productivity. We define two categories of advisors: the top 1000 economists in the world and the rest. Overall, half of the Ph.D. completers in our sample (N=213) had a globally-ranked research as an advisor; U.S. baccalaureate holders had 54 percent compared with 47 percent with undergraduate degrees from abroad.

Our principal finding about the student-advisor match is that those with foreign undergraduate degrees were more likely to work with top global researchers in schools in the top three tiers, relative to other schools. By contrast, those with U.S. baccalaureates were only significantly more likely to have such a ranked advisor if they were in tier 1 or 2 program. Furthermore, the probit marginal effects indicate that at each tier foreign baccalaureates had more than a 50 percent greater likelihood of pairing with a ranked advisor. Might this result from the difficulty applicants from abroad face in demonstrating and revealing their true talent? As with employer learning about workers' abilities and job match via observed on-the-job productivity, perhaps talent revelation occurs in graduate school.

Given the recent scholarship by Hilmer and Hilmer (2006) regarding the role of globally ranked dissertation advisors on students' subsequent research productivity, we show that working with such exceptional scholars provides one of the key benefits of enrolling in a highly-ranked economics doctoral program for initial job placement, publication success, and earnings.

Completion

Columns 4-6 of Table 4 show marginal effects of probit regressions where the dependent variable is equal to one if an individual eventually completed a PhD. The first specification that

includes all applicants shows that foreign undergraduates are significantly more likely to have completed a PhD. At lease in part, this should not be a surprising result since American citizens can more easily take a full time job and leave a doctoral program as their interests and personal circumstances change and more compelling opportunities arise.[6] And, on the other hand, non-citizens graduate students have visas that prohibit them from abandoning their Ph.D. studies for work in the U.S. and there is considerable evidence that many foreigners pursue doctorates for the immigration option value that it offers them. As a consequence, none of the variables we include in the separate completion regression for baccalaureates from abroad are statistically significant (column 6).

For U.S. undergraduates, by contrast, both the type of funding in graduate school and two demographic variables—gender and being married—significantly and positive predict Ph.D. completion. The marginal effects of the probit model indicates that being a research assistant increased the probability of finished the degree by one third compared to just 11 percent for those with full fellowships (at the 10 percent level). This outcome that those who looked best in the selection process and were awarded fellowship have greater attrition hazards raises the question of whether routinized interaction with faculty (via being an RA or TA) improves graduate students success.

Time-to-Degree

To evaluate time-to-degree for our sample of economics Ph.D. completers, we created four temporal categories: four years or less (1), 5 years (2), 6-7 years (3), and 8 years or more (4). Thirty-eight percent of the respondents completed in 5 years, 32 percent in 6-7 years, and roughly equal numbers completed more quickly or slowly.

[6] We expect this to be more pronounced for U.S. doctoral students in or near major metropolitan areas and after

If the differences in domestic baccalaureates have lower opportunity costs of completing the doctorate than do foreigners, as suggested in the previous section, then foreign citizens might take longer finish their degrees since they are less likely to self-select out of the program along the way. Tuckman, Coyle, and Bae (1990) found that foreign baccalaureates took longer to complete the degree, in a study of elapsed-time-to-degree over a 20-year period based on National Science Foundation's Survey of Earned Doctorates (SED) records. By contrast, Ehrenberg and Mavros (1995) found that foreign students who entered Cornell's economics Ph.D. program over a twenty year period completed their doctorates sooner. Our results, though, indicate no differences in time-to-degree according to the location of undergraduate studies (Table 3, column 7).

In separate regressions by undergraduate location, there are several notable findings. Inclusion of the categorical variable indicating whether an individual accepted a full time job before completing the Ph.D. strongly predicts slower completion of the degree in all three specifications of the model. The quality of the Ph.D. program affects the time to finish the degree for foreign baccalaureates, but not domestics. Specifically, attending a school in tiers 1-3 is correlated with significantly faster completion for foreign baccalaureates.

Strikingly, having a globally-ranked researcher as an advisor had strongly significant but opposite effects for the two sub-samples: it speeds U.S. undergraduates Ph.D. completion (at the 10 percent level) but lengths the time foreign baccalaureates take to finish their doctorates (at the 5 percent level). It is unclear why this is the case but given the current interest in the role of ranked advisors it is a curious finding. The model of U.S. collegiate alums explains twice as much of the variation in degree completion time than it does for alums of foreign institutions (20

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students have acquired econometric skills that are highly valued in the private sector.

percent versus 10 percent).

We confirm the findings of no effect of age or marriage (Siegfried and Stock, 2001) or gender (Ehrenberg and Mavros, 1995; Baker, 1999) on the speed of Ph.D. completion for applicants with U.S. or foreign baccalaureate degrees or all of them together (column 7-9).[7] Although we do not show the results here, we find no evidence that being an alum of an elite undergraduate institution (Tuckman, Coyle, and Bae, 1990) or having a prior graduate degree sped completion (Siegfried and Stock, 2001, found that it did but Ehrenberg and Mavros, 1995 found no effect) or that having children slowed only women (as Siegfried and Stock, 2001, report).

V. Career Success: Jobs, Research Productivity, and Salaries

Controlling for differences in the demographics, we estimated the effect of program quality, advisor rank, and time-to-degree on initial job placement, research productivity, and 2005 salary.

Initial Job Placement

Barbezat (1992) and Singell (1994) found that candidates from top-ranked programs were more likely to find employment at both another top-ranked academic program and in the nonacademic sector. Our analysis of initial job placement with a tobit model confirms this finding for the top five programs only, controlling for demographic variables, graduate student funding, the quality of the dissertation advisor and time-to-degree. Interestingly, though, the

[7] Siegfried and Stock's (2001) duration analysis of the determinants of elapsed time to earn a doctorate for 618 newly-minted Ph.D.s, age and marriage made no difference. Siegfried and Stock (2001) found that students with a prior master's degree finished faster, whereas Ehrenberg and Mavros (1995) found no effect for either gender or having a prior master's degree. Controlling for ability, Baker (1999) showed that women and minorities progress to and complete the Ph.D. in a similar fashion to that of white males.

PhD. program quality affects only U.S. baccalaureates, and does so for those from the top 10 ranked departments, but not those who obtained their undergraduate degree abroad. Our results suggests that U.S. undergraduates with a Ph.D. from a tier 1 department improved their job quality by 194 slot, equivalent to being at Erasmus University (#73) rather than either Clemson University or the U.S. Court of Appeals—Seventh Circuit (both ranked #220). Specifically, having a Ph.D. from a Tier 2 program increased an individual's placement by 173 spots but taking longer to finish the Ph.D. decreased the placement by 70 positions.

By contrast, the identical model for foreign baccalaureates explains less of the variation in placement (2 percent compared to 7 percent for U.S. baccalaureates) and with no significant variables.

Research Productivity

Numerous articles have evaluated the determinants of economists' scholarly productivity so we will test those relationships with this data. We use two measures of research productivity: publishing at least one peer-reviewed article and the number of peer-reviewed articles. Given the lumpy nature of the distribution of peer reviewed publications (21 percent of the sample had none), we conduct probit regressions, where the dependent variable is equal to one if an individual had at least one publication. The marginal effects of these probit results are shown in Table 5, columns 1-3. We estimate the determinants of the total number of peer-reviewed publications with in a tobit model.

Buchmueller et al., (1999) and others report that individual publication rates are related to gender. Our results indicate only a significant negative relationship for female economics Ph.D.s who obtained their undergraduate training abroad—for both publication measures (Table 5, columns 3 and 6). Laband (1986) among others has found a positive publication effect for the

quality of the graduate school attended. In neither of our overall publication regressions does it matter whether doctorates trained at a tiers 1, 2 or 3 program relative to the others. Our regressions by location of undergraduate training, though, show that foreigners, but not of domestics, Ph.D. program quality strongly predicted the quantity of publications. Specifically, having a doctorate from a top 18 program increased the number of publications from 5-9. Domestics with Ph.D.s from tier 3 programs, though, were 18 percent more likely to have published something.

Although Buchmueller et al., (1999) report increased publication success for those with research experience in graduate school, remarkably we obtain strongly significant but opposite results depending upon the location of undergraduate education. Whereas RA experience in graduate school reduced foreign baccalaureates publications by over 8, it boosted the research output of domestics by 7. The same statistically significant pattern exists regarding the relationship between having had a fellowship in graduate school and subsequent research output: domestics published 8 more but foreigns over 5 less. We offer no explanation for these arresting results at this point, but are investigating the relationships further. As indicated by Tables 6 and 8, this relationship foreign versus domestic grad school funding effect dichotomy persists for academic superstars and regarding all and academic salaries. To our knowledge, no such relationship has been previously established.

Conroy and Dusansky (1995) and Buchmueller et al., (1999) find that one's employer matters for research productivity. Our results indicate that this is especially true for foreign undergraduates since having an academic job strongly, significantly increased both the likelihood they would publish and the number of publicatins, while having had an initial job in a Ph.D.-granting institution increased the probability of publishing by 29 percent. Domestic

undergraduates with academic jobs were also predicted to publish more.

Finally, McDowell and Singell (2000) find that foreign-born economists' research productivity increases when they spend more time in the United States. We find no evidence that foreign baccalaureates working in the U.S. in 2006 were either more likely to publish or to publish more (Table 5, columns 1, 3, 4 and 6). We also find that, holding other things constant, foreign undergraduates and domestic undergraduates do not have significantly different numbers of publications or likelihoods of publishing.

Salary

Our survey instrument asks respondents to indicate which of eight categories describes their "total annual pay in 2005 before taxes," "including your base pay, consulting fees, and any other sources of earnings" in U.S. dollars. The eight salary categories begin with less than $30,000 and increase by $20,000 increments to a maximum of more than $150,000. The sample mean of 5.75 corresponds to the upper end of the income range of $90,000-$109,000 (Table 1). Doctorates from Tier 1 schools had mean salaries in the $110,000-$129,000 range versus $70,000-$89,000 for Tier 5 graduates (results not shown in tables).

Ordered probit regressions of the determinants of respondents' salary category indicate that foreign baccalaureates have significantly lower salaries (around $16,000 less). We find many differences in salaries by location of those individuals' undergraduate degree. Those from the U.S. had lower salaries if they were women, but higher salaries if they had a full fellowship or an RAship in graduate school, or attended a tier 1 or 2 graduate program. Experience was quadratically related to salary, while academics earned slightly less than non-academics. Our results indicate no differences in earning regarding publications success, dissertation advisor, the quality of the initial job placement or the type of academic employer, once we control for these

other factors.

For foreign baccalaureates, controlling for the same set of factors, the three strongest determinants of income are working in the U.S., being an academic, and being an older applicant. Individuals who applied when they were at least 25 years of age and academics earned less, while being in the United States increased earnings. As with U.S. bachelor's degree holders, we find no salary effect of the quality of the dissertation advisor, the initial job placement, or the type of academic employer.

Academic Salaries

A separate ordered probit analysis of 2005 salaries for academics (N=82) finds that, controlling for quality of Ph.D. program, advisor, initial job placement, research productivity, experience and type of academic job, those with a foreign undergraduate degree earned less than others (Table 6, column 4). U.S. baccalaureates who had fellowships or RAships had $40,000-60,000 higher salaries, relative to other academics who were TAs in graduate school. Note that for those with undergraduate training abroad the RA and fellowship coefficients are both negative but the RA coefficient is significantly so suggesting lower earnings by $20,000. Lower (better) initial job placements are correlated with higher salaries for U.S. but not for foreign undergraduates. And, foreign baccalaureates, but not domestic ones, earned more as alums of tier 2 doctoral programs. Neither gender, having children, teaching in business school nor having a ranked advisor significantly affected academic salaries. teaching in business school

VI. Economics Superstars: Selection and Career Developments

As the foregoing analysis has emphasized, the quality of the Ph.D. program and of the dissertation advisor figure prominently as significant predictors of overall career success. So far in

our analysis, we have used overall job placement, PhD completion, time-to-degree, having positive publications, and number of total publications as our measures of success. But many graduate programs are particularly interested in picking the very best students, those that will be at the top of the class, obtain the best jobs, and publish in the leading journals. Here we turn our attention to the superstars.

Ex Ante Signals of Superstars: Admission and Funding

To determine the criteria graduate school admission committees' use to select the superstar applicants, we use two admission and one funding measures: attendance at a Tier 1 program (n=301), an index of self-reported full funding offers from the top five economics departments (n=150), and the sum of the admission committee members' ratings at the target top five economics department (n=128 because not all of the application folders were rated by the committee)

A probit model of the determinants of attending a Tier 1 program indicate that applicants from foreign undergraduate institutions were 21 percent more likely to do so. For those with U.S. baccalaureates, enrolling in a top doctoral program was associated with having a letter from a Reference 1 individual and having high quantitative GRE scores. Having a Reference 1 letter boosted the prospects of attending a top 5 program by 39 percent, while a 50 increase in quantitative GRE increases this likelihood by 13 percent. For applicants from universities abroad, Reference 1 individuals and higher GRE quantitative scores also positively predict attending a tier 1 Ph.D. department, but a number of other variables are also significant. Attending a top tier PhD program is negatively associated with age, being female (significant at 10 percent), while those from better (lower) ranked undergraduate schools are more likely to attend a top program. These models explain the same amount of the variation in tier 1

attendance for foreign and U.S. baccalaureate holders (30 percent for both).

Our survey respondents indicated whether they were admitted to as many as ten departments and, if so, with what type of funding (i.e., none, tuition only, or tuition plus stipend). We have created an index of the number of full funding offers (tuition plus stipend) that applicants received from top five Ph.D. programs. While this number theoretically could be as high as 5, the maximum number in our sample is 4, with 5 applicants receiving this many full offers. For both foreign and U.S. undergraduate applicants, funding at the top five Ph.D. programs was strongly influenced by having a Reference 1 letter writer (and by Reference 2 for foreign). Higher quantitative GRE scores are also correlated with more full funding offers, with this coefficient being significant at the 5 percent level for domestic students and at the 10 percent level for foreign students.

The top 5 department's admission committee's sum of ratings variable provides a consistent, although idiosyncratic, assessment of application information for 85 percent of the applicants. In an OLS regression, higher GRE quantitative scores significantly improved applicants' sum of ratings for baccalaureates from either the U.S. or abroad. In addition, for applicants with U.S. bachelor's degrees, verbal GRE scores and having majored in math improved their admission committee ratings, but being over 24 years of age as an applicant lowered it. A Reference 1 letter writer increased foreign undergraduate applicants' rating by over 7 units, from a mean rating of 6.4 to 13.6 (out of a maximum of 18).

Jointly these three models provide a consistent pattern of evidence and suggest common signals of potential economics talent with some differences for applicants with a U.S. versus a foreign baccalaureate. Common indicators include the importance of math aptitude and a credible signal of outstanding potential in the form of a reference from globally recognized

scholars as well as age (negatively). Regarding differences, U.S. undergraduate applicants were more likely to be viewed as a top prospect if they demonstrated their math interest and preparation (by majoring in it). For those from abroad, Reference 1 letter writer were more important than they were for domestic students.

Superstar Job Placement

Many academic departments measure the success of their graduate programs based on the number of top job offers their students receive. Here we define particularly good success in the job market as landing a job that is ranked in the top 30 departments globally (as ranked by Roessler's econphd.net and described above). Columns 1-3 of Table 8 show marginal effects for probit regressions of the likelihood of being initially placed at a top 30 job for all applicants, domestic undergrads, and foreign undergrads, respectively. It is unsurprising that landing a premier job is most correlated with the quality of the PhD program attended, but this is more the case for domestic than foreign baccalaureates. For foreign undergraduates, there are no other variables that significantly predict being placed at a top job. But top job placement for U.S. undergraduates is also strongly, positively related to being an RA or having a full fellowship in graduate school as well as having children.

Superstar Research Productivity

Broadly speaking, we find that publishing in the most prestigious journals is associated with the quality of the Ph.D. department and of the first job and whether the first job was academic and in a Ph.D.-granting program, though the significance of these coefficients varies by where the individuals received their undergraduate training.

For those with a U.S. baccalaureate degree, having the first job be in a Ph.D.-granting department significantly increased the number of quality adjusted publications as did being married

in graduate school. For those with undergraduate degrees from abroad, quality adjusted publications were predicted by having a doctorate from a tier 1 program, having an academic job and the rank of the initial job. Females also had a lower weighted index of publications than males in the foreign group. Curiously, for those with foreign baccalaureates RA and fellowship funding in graduate school is strongly, negatively related with this measure of research productivity. These tobit models explain more of the variation in quality adjusted publications for foreign than U.S. undergraduates (28 versus 18 percent).

VII. Conclusion

Our goal with this project is to use this Ph.D. applicant data set to evaluate how U.S. selection committees identify the talent they seek from an applicant pool containing roughly equal numbers of foreign and domestic applicants. Obviously, in addition to innate differences in economics ability and interest and other factors such as creativity, domestic and foreign applicants may have systematic differences in their motivation (i.e., for foreigners, a Ph.D. can be a route to U.S. citizenship) and face distinct constraints (i.e., foreign graduate student visas do not allow them to leave graduate school and obtain a job in the U.S.). This analysis describes a set of path dependent factors that explain, in part, the professional development and success of economists.

We find that many of the results previously reported in the literature regarding determinants of some aspect of success from admission to current salary and research productivity vary according to whether the individuals received their undergraduate training in the U.S or elsewhere. A dichotomous variable indicating the individual obtained a non-U.S. baccalaureate significantly and meaningfully influences the following five outcomes: the tier of

Ph.D. program attended or the likelihood of attending a tier 1 program (positively), doctoral completion (positively), and both general and academic salaries (negatively). GRE scores importantly influence the sorting of applicants into Ph.D. programs by quality: verbal scores are important for applicants from foreign universities but quantitative scores for those from the U.S.

One of the interesting relationships revealed in our analysis is the matching of foreign undergraduates with globally ranked research economists. Although applicants from foreign undergraduate institutions have lower admission indexes, we find that in graduate school that are more likely to get paired with ranked advisors. If applicants from abroad send noisy signals of their true talent, perhaps graduate school performance provides a more important secondary sorting function for them than for students from American universities. Curiously, though, the ranked advisor effect on students' time-to-degree has significant but opposite influences– speeding completion for domestics but lengthening it for the others.

A different but similar distinction arises with the impact of having a fellowship or experience as a research assistant in graduate school. Both negatively influence foreign and positively effect U.S. baccalaureates' likelihood of a top 30 research job, research productivity, and salaries (for publications see, Table 5, column 3, 5 and 6 and Table 8, columns 7-9; for salaries, see Table 6; and for top 30 jobs, see Table 8, columns 1-3). This is a striking finding since our longitudinal data and analysis span a 17 year period of time.

Whereas economics Ph.D.s in our sample who have foreign undergraduate degrees earn less than those from the U.S., we find that remaining in the U.S. more than offsets that negative effect (Table 6, column 1 and 3). Finally, our placement models (overall, academic and top 30 jobs) all explain much less of the variation in foreign baccalaureates' employment outcomes that for those from the U.S.

While our data has considerable advantages, there are limitations since the sample contains applicants to a particular top-five economics Ph.D. program in 1989. Thus, our data contain individuals who either enrolled in, or aspired to enroll in, an elite program, rather than a representative sample of all economics Ph.D. applicants.

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Table 1: Means

Variable	All N	All Mean	All Std. Dev.	Domestic N	Domestic Mean	Domestic Std. Dev.	Foreign N	Foreign Mean	Foreign Std. Dev.
Female	344	0.26	0.44	167	0.34	0.47	177	0.19	0.39
Age 25 plus	336	0.51	0.50	166	0.36	0.48	170	0.66	0.47
Graduate Degree	344	0.41	0.49	166	0.23	0.42	177	0.57	0.50
Undergrad Rank	344	132.00	80.48	167	97.50	87.76	177	164.55	56.24
Reference Group 1	344	0.11	0.32	167	0.19	0.39	177	0.04	0.20
Reference Group 2	344	0.18	0.38	167	0.24	0.43	177	0.12	0.32
Complete PhD	344	0.65	0.48	167	0.59	0.49	177	0.72	0.45
Foreign Undergrad	344	0.51	0.50						
Ratings by Top 5 School	293	7.17	4.29	141	8.01	4.54	152	6.40	3.91
Rank of Phd School Attended	241	21.50	27.43	105	16.89	26.65	136	25.06	27.59
Married	160	0.44	0.50	83	0.46	0.50	77	0.43	0.50
Children	160	0.19	0.40	83	0.12	0.33	77	0.27	0.45
Econ Major	160	0.67	0.47	83	0.77	0.42	77	0.56	0.50
Math Major	160	0.11	0.31	83	0.17	0.38	77	0.04	0.19
Total Top 5 Full Scholarships	160	0.66	1.10	83	0.88	1.26	77	0.42	0.85
Overall Admission Score	154	715.74	493.74	79	837.53	484.44	75	587.45	473.45
Only those that completed PhD									
Initial Job Rank	225	219.9	142.3	98	217.7	143.2	127	221.4	142.3
Academic Job	225	0.57	0.50	98	0.53	0.50	127	0.60	0.49
1st Job Phd School	225	0.21	0.41	98	0.21	0.41	127	0.21	0.41
At Least One Publication	225	0.69	0.46	98	0.71	0.45	127	0.68	0.47
Total Publications	225	4.54	6.13	98	4.94	6.33	127	4.23	5.98
At Least One Top 4 Publication	225	0.18	0.39	98	0.15	0.36	127	0.20	0.41
Top 4 Publications	225	0.40	1.15	98	0.39	1.30	127	0.42	1.03
Weighted Publication Index	225	0.78	1.69	98	0.85	1.91	127	0.74	1.51
Ranked Advisor	212	0.50	0.50	88	0.54	0.50	124	0.47	0.50
Salary Classification (1-8)	154	5.75	2.17	79	6.29	1.95	75	5.19	2.26
Time to Degree	136	5.86	1.87	66	6.06	1.55	70	5.67	2.12

Table 2: Admission to Graduate School

Indep. Variable	Tier of Phd School Attended (Ordered Probit)			Admission Score (OLS)		
	All	Domestic	Foreign	All	Domestic	Foreign
Quant. GREx100	-0.582***	-0.766***	-0.497***	202.123**	259.635*	145.428
	(0.117)	(0.178)	(0.162)	(86.631)	(135.633)	(122.776)
Verbal GREx100	-0.164**	-0.058	-0.177**	108.494***	49.394	138.584***
	(0.064)	(0.121)	(0.078)	(39.307)	(71.454)	(51.300)
Female	-0.243	-0.634***	0.296	-39.223	61.714	-221.947
	(0.154)	(0.209)	(0.245)	(88.666)	(115.229)	(162.405)
Age 25 plus	0.114	0.031	0.132	-213.383**	-190.889	-148.118
	(0.149)	(0.210)	(0.224)	(83.592)	(133.722)	(123.419)
Graduate Degree	-0.172	-0.464**	-0.031	113.712	54.946	117.859
	(0.153)	(0.236)	(0.209)	(99.279)	(138.164)	(158.055)
Reference Group 1	-1.034***	-1.077***	-1.521**	310.829***	262.651*	345.558
	(0.241)	(0.288)	(0.642)	(114.935)	(142.433)	(237.399)
Reference Group 2	-0.454***	-0.454**	-0.492*	221.483**	149.228	257.599
	(0.173)	(0.228)	(0.289)	(97.226)	(136.429)	(160.249)
Undergrad Ranking	0.001	0.000	0.003*	-0.520	-0.610	-0.934
	(0.001)	(0.001)	(0.002)	(0.539)	(0.712)	(0.972)
Econ Major	...	...	...	83.142	90.867	39.398
				(101.075)	(148.404)	(155.851)
Math Major	...	...	...	61.846	106.119	-186.353
				(121.945)	(138.498)	(321.402)
Foreign Undergrad	-0.553***	...	...	85.223	...	...
	(0.172)			(101.723)		
Constant	...	...	...	-1,531.663**	-1,584.930	-1,092.516
				(637.492)	(993.640)	(931.337)
Observations	301	156	145	145	79	66
(Pseudo) R-squared	0.08	0.12	0.07	0.32	0.28	0.35

Phd program tier are as follows - tier 1: ranked 1-5; tier 2: ranked 6-10, tier 3: ranked 11-20; tier 4: ranked 21 or higher.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Graduate School Experience

Indep. Variable	Ranked Advisor (Probit)			Completed PhD (Probit)			Time to Deg. Categ. (Ord. Probit)		
	All	Domestic	Foreign	All	Domestic	Foreign	All	Domestic	Foreign
Female	0.110	-0.019	0.290	0.063*	0.148**	-0.015	0.057	0.369	-0.281
	(0.116)	(0.157)	(0.214)	(0.031)	(0.062)	(0.069)	(0.233)	(0.318)	(0.423)
Age 25 Plus	0.029	-0.134	0.211	-0.007	0.001	0.011	-0.175	-0.151	-0.173
	(0.119)	(0.176)	(0.186)	(0.041)	(0.084)	(0.050)	(0.229)	(0.366)	(0.324)
Married	-0.075	-0.257*	0.278	0.119***	0.180**	...	0.184	0.317	0.058
	(0.112)	(0.143)	(0.190)	(0.042)	(0.075)		(0.220)	(0.326)	(0.353)
Children	-0.159	-0.039	-0.408**	...	...	...	0.368	0.693	0.286
	(0.153)	(0.254)	(0.170)				(0.303)	(0.533)	(0.400)
RA	0.022	0.170	-0.149	0.191***	0.330***	0.055	-0.143	-0.060	-0.030
	(0.152)	(0.249)	(0.218)	(0.062)	(0.095)	(0.070)	(0.296)	(0.491)	(0.405)
Full Fellowship	0.167	0.224	0.133	0.049	0.113*	0.016	-0.327	-0.183	-0.220
	(0.163)	(0.244)	(0.258)	(0.034)	(0.065)	(0.70)	(0.344)	(0.570)	(0.465)
Tier 1 PhD	0.665***	0.593***	0.833***	...	...	...	-0.627**	-0.621	-1.104**
	(0.096)	(0.169)	(0.112)				(0.308)	(0.506)	(0.457)
Tier 2 PhD	0.519***	0.372**	0.695***	...	...	...	-0.206	0.184	-0.916*
	(0.097)	(0.176)	(0.119)				(0.331)	(0.505)	(0.498)
Tier 3 PhD	0.423***	0.144	0.616***	...	...	...	-0.693**	0.306	-1.487***
	(0.113)	(0.258)	(0.169)				(0.343)	(0.617)	(0.464)
Ranked Advisor	...	...	...	...	...	...	-0.066	-0.677*	0.709**
							(0.229)	(0.352)	(0.360)
Full Time Job Before Complete PhD				...	...	...	0.854***	0.698**	1.074***
							(0.232)	(0.327)	(0.380)
Foreign Undergrad	0.025	...	...	0.109***	...	...	-0.323	...	...
	(0.109)			(0.045)			(0.216)		
Observations	132	63	69	157	83	74	130	63	67
Pseudo R-squared	0.24	0.24	0.36	0.29	0.31	0.06	0.10	0.20	0.10

Notes: Ranked dissertation advisors are among the top 1,000 economists in the world, as ranked by Coupe (2003), who uses a weighted average of the eleven different measures of research productivity. Admission index is constructed using two components -- the rank of the schools an individual is admitted to and the funding offered. There are 4 time to degree categories: less than 5 years, 5, 6-7, more than 7. For probit regressions, marginal effects are reported. Standard errors are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Job Placement

Indep. Variable	Initial Job Placement (Tobit)			Academic Job (Probit)		
	All	Domestic	Foreign	All	Domestic	Foreign
Female	-15.064	-75.112	50.701	0.149	0.098	
	(43.950)	(46.645)	(82.279)	(0.096)	(0.148)	
Age 25 Plus	24.186	17.036	62.121	-0.001	0.013	0.027
	(42.466)	(55.291)	(61.124)	(0.101)	(0.176)	(0.132)
Married	29.093	-6.682	42.903	0.010	0.182	-0.023
	(41.332)	(47.383)	(67.095)	(0.100)	(0.156)	(0.147)
Children	17.090	-81.560	63.782	0.047	0.103	-0.051
	(58.084)	(77.190)	(79.921)	(0.131)	(0.230)	(0.176)
RA	-49.391	-125.364	27.293	-0.214*	-0.202	-0.189
	(58.010)	(78.433)	(79.907)	(0.126)	(0.223)	(0.157)
Full Fellowship	-100.962	-111.288	-78.267	0.016	-0.068	0.130
	(65.358)	(88.908)	(88.943)	(0.161)	(0.275)	(0.185)
Tier 1 PhD	-146.827**	-194.477**	-82.485	0.017	-0.024	-0.012
	(59.885)	(87.871)	(86.366)	(0.135)	(0.245)	(0.183)
Tier 2 PhD	-94.754	-172.653*	-119.014	0.164	0.310	0.039
	(64.944)	(89.406)	(98.383)	(0.124)	(0.192)	(0.198)
Tier 3 PhD	13.864	-134.361	29.455	0.068	0.255	0.030
	(66.966)	(104.228)	(91.225)	(0.140)	(0.206)	(0.180)
Ranked Advisor	-32.886	-27.825	-21.756	0.022	0.132	-0.034
	(43.148)	(51.955)	(68.877)	(0.102)	(0.168)	(0.142)
Time To Degree	16.609*	70.002***	3.140	-0.042*	-0.150***	-0.017
	(9.753)	(18.263)	(12.271)	(0.022)	(0.056)	(0.028)
Foreign Undergrad	-47.710	...	...	0.140	...	...
	(40.162)			(0.095)		
Constant	301.081***	137.817	205.279	...	...	...
	(99.323)	(140.292)	(124.709)			
Observations	130	63	67	130	63	67
R-Squared	0.03	0.07	0.02	0.10	0.20	0.08

Notes: Job placement is ranked using Christian Roessler's econphd.net rankings of 433 economics research institutions based on the number and length of articles published. Universities are ranked 1 to 321 and other organizations from 1 to 112, and following Oyer's (2006) approach of coding the universities as 1 to 321, other organizations' as their rank times 2 plus 50, and then all others coded as 350. Tobits of initial placement have an upper limit of 350. For probit regressions, marginal effects are reported. Standard errors are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Research Productivity

Indep. Variable	At Least 1 Publication (Probit)			Total Pubs (Tobit)		
	All	Domestic	Foreign	All	Domestic	Foreign
Female	-0.086	0.072	-0.622**	-3.634**	-0.878	-8.588***
	(0.112)	(0.124)	(0.246)	(1.557)	(1.942)	(2.300)
Age 25 Plus	-0.046	-0.021	0.000	-1.130	0.372	-1.623
	(0.093)	(0.135)	(0.140)	(1.490)	(2.283)	(1.555)
Married	0.066	0.179	-0.031	0.872	4.975**	-2.103
	(0.101)	(0.148)	(0.166)	(1.445)	(1.927)	(1.734)
Children	-0.217	-0.208	-0.250	-3.586*	-3.400	-1.535
	(0.151)	(0.270)	(0.223)	(1.971)	(3.182)	(1.957)
RA	-0.023	0.207	-0.295*	-1.626	6.867**	-8.080***
	(0.123)	(0.204)	(0.164)	(1.972)	(3.227)	(1.960)
Full Fellowship	-0.020	0.121	-0.428	0.481	8.026**	-5.615**
	(0.153)	(0.161)	(0.310)	(2.277)	(3.618)	(2.399)
Tier 1 PhD	0.089	-0.005	0.173	1.732	-5.494	5.338**
	(0.122)	(0.176)	(0.153)	(2.091)	(3.322)	(2.138)
Tier 2 PhD	0.143	0.173	0.132	2.497	-2.654	8.910***
	(0.097)	(0.119)	(0.148)	(2.209)	(3.195)	(2.450)
Tier 3 PhD	0.046	0.178**	0.060	2.205	0.960	5.455**
	(0.114)	(0.085)	(0.149)	(2.263)	(3.856)	(2.255)
Ranked Advisor	0.242***	0.252*	0.315**	3.283**	5.229**	0.975
	(0.093)	(0.150)	(0.147)	(1.466)	(2.030)	(1.681)
Academic Job	0.096	-0.009	0.388**	4.958***	4.233*	6.360***
	(0.106)	(0.139)	(0.195)	(1.698)	(2.344)	(1.899)
Initial Job Rank	-0.000	0.000	-0.000	-0.004	0.008	-0.007
	(0.000)	(0.001)	(0.000)	(0.006)	(0.009)	(0.007)
1st Job Phd Inst.	0.150	0.194	0.289*	0.756	1.116	1.193
	(0.098)	(0.119)	(0.151)	(1.774)	(2.473)	(1.528)
Experience	0.196*	0.344	-0.014*	0.692	2.556	-0.051
	(0.115)	(0.325)	(0.008)	(1.804)	(6.140)	(0.085)
Exp Sq	-0.009	-0.014	-0.126	-0.004	-0.016	-1.893
	(0.006)	(0.016)	(0.241)	(0.095)	(0.291)	(2.067)
Foreign Undergrad	0.076	...		-1.216	...	
	(0.098)			(1.470)		
Foreign*Currently in US	-0.056	...	-0.161	-1.807	...	-2.576
	(0.159)		(0.205)	(2.278)		(1.782)
Constant	...	...	...	-5.830	-33.403	-0.316
				(9.204)	(32.398)	(7.366)
R-Squared	0.23	0.28	0.37	0.07	0.10	0.15
Observations	132	63	69	132	63	69

For probit regressions, marginal effects are reported. Standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Salary Category (Ordered Probits)

Indep. Variable	All Jobs			Academic Jobs		
	All	Domestic	Foreign	All	Domestic	Foreign
Female	-0.528**	-1.243***	0.162	-0.049	-0.511	0.165
	(0.254)	(0.410)	(0.468)	(0.313)	(0.572)	(0.542)
Age 25 Plus	-0.387	-0.417	-0.676**	-0.266	0.139	-0.831**
	(0.239)	(0.417)	(0.332)	(0.296)	(0.630)	(0.401)
Married	-0.017	0.186	0.158	0.190	1.080*	-0.070
	(0.236)	(0.372)	(0.362)	(0.293)	(0.570)	(0.431)
Children	-0.233	0.476	-0.620	-0.154	-0.151	0.339
	(0.316)	(0.618)	(0.457)	(0.376)	(0.860)	(0.565)
RA	0.260	1.553***	-0.347	-0.111	2.081**	-1.005*
	(0.319)	(0.595)	(0.441)	(0.389)	(0.983)	(0.545)
Full Fellowship	0.542	2.161***	0.066	0.332	2.969***	-0.191
	(0.372)	(0.680)	(0.509)	(0.453)	(1.113)	(0.646)
Tier 1 PhD	0.550*	1.051*	0.163	0.622	0.745	0.441
	(0.334)	(0.560)	(0.484)	(0.446)	(1.036)	(0.613)
Tier 2 PhD	0.839**	1.112**	0.859	0.979**	1.072	1.516**
	(0.356)	(0.562)	(0.553)	(0.469)	(1.059)	(0.733)
Tier 3 PhD	0.112	0.365	-0.198	-0.386	-0.160	-0.329
	(0.332)	(0.607)	(0.474)	(0.450)	(1.128)	(0.642)
Ranked Advisor	0.014	0.184	-0.176	-0.005	0.053	-0.170
	(0.243)	(0.374)	(0.380)	(0.319)	(0.573)	(0.510)
Academic Job	-0.811***	-0.754*	-1.296***	...	...	...
	(0.269)	(0.430)	(0.412)			
Initial Job Rank	-0.002**	-0.002	-0.002	-0.003**	-0.005*	-0.003
	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)
Current Job Bus. School	-0.316	-0.413	0.130	-0.466	0.196	-0.545
	(0.512)	(0.782)	(0.835)	(0.533)	(0.906)	(0.909)
Current Job PhD School	0.829	0.984	8.076	1.343**	1.714*	8.131
	(0.619)	(0.775)	(810,825)	(0.658)	(0.972)	(364)
Publications	0.019	-0.008	0.052	0.035*	0.011	0.055
	(0.018)	(0.030)	(0.033)	(0.021)	(0.041)	(0.036)
Experience	-0.265	-1.467*	-0.229	-0.395	-2.605	-0.203
	(0.263)	(0.828)	(0.312)	(0.306)	(2.878)	(0.392)
Exp Sq	0.020	0.082*	0.018	0.027	0.131	0.015
	(0.014)	(0.042)	(0.018)	(0.017)	(0.135)	(0.023)
Foreign Undergrad	-0.688***	...		-0.651**	...	
	(0.238)			(0.298)		
Foreign*Currently in US	1.224***	...	1.108**	0.467	...	0.657
	(0.422)		(0.474)	(0.550)		(0.613)
Pseudo R-Squared	0.16	0.23	0.15	0.20	0.35	0.19
Observations	127	61	66	82	37	45

Notes: Salary categories are as follows: less than $30,000; 30,000-49,999; 50,000-69,999; 70,000-89,999; 90,000-109,999 110,000-129,999; 130,000-149,999; More than 150,000.
Standard errors in parentheses* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Predicting Superstars: Admission Success

Indep. Variable	Attend Tier 1 PhD Probit			Full Scholarships from Top 5 Schools OLS			Rating from 1 Top 5 School OLS		
	All	Domestic	Foreign	All	Domestic	Foreign	All	Domestic	Foreign
Quant. GREx100	0.191***	0.258***	0.166**	0.508**	0.582*	0.557**	3.391***	3.690***	3.491***
	(0.048)	(0.069)	(0.072)	(0.195)	(0.345)	(0.209)	(0.800)	(1.137)	(1.173)
Verbal GREx100	0.051**	0.002	0.052*	0.160*	0.193	0.146	0.334	1.421**	-0.467
	(0.023)	(0.044)	(0.029)	(0.088)	(0.181)	(0.088)	(0.361)	(0.554)	(0.514)
Female	0.010	0.123	-0.125*	-0.068	-0.043	-0.251	-0.680	-0.308	-2.004
	(0.056)	(0.082)	(0.064)	(0.198)	(0.294)	(0.276)	(0.776)	(0.934)	(1.472)
Age 25 plus	-0.123**	-0.043	-0.197**	-0.359*	-0.496	-0.146	-1.555**	-2.150**	-1.410
	(0.055)	(0.076)	(0.091)	(0.185)	(0.330)	(0.210)	(0.740)	(1.060)	(1.154)
Graduate Degree	0.076	0.187	0.024	0.127	0.374	-0.177	-0.363	-0.015	-0.648
	(0.062)	(0.119)	(0.076)	(0.223)	(0.349)	(0.270)	(0.868)	(1.082)	(1.480)
Reference Group 1	0.374***	0.387***	0.721***	1.016***	0.990***	0.958**	2.854***	1.422	7.193***
	(0.110)	(0.131)	(0.206)	(0.253)	(0.352)	(0.405)	(1.029)	(1.150)	(2.376)
Reference Group 2	0.173**	0.129	0.245*	0.386*	0.173	0.860***	0.976	0.812	0.840
	(0.079)	(0.097)	(0.149)	(0.216)	(0.338)	(0.274)	(0.895)	(1.128)	(1.560)
Undergrad Ranking	-0.001***	-0.001	-0.002***	-0.000	0.000	-0.002	-0.002	0.002	-0.001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.006)	(0.010)
Econ Major	…	…	…	-0.128	-0.248	-0.072	-0.523	0.001	-1.008
				(0.224)	(0.368)	(0.263)	(0.893)	(1.181)	(1.458)
Math Major	…	…	…	0.347	0.362	0.055	2.652**	2.985***	1.301
				(0.271)	(0.351)	(0.548)	(1.108)	(1.123)	(3.869)
Foreign Undergrad	0.214***			0.170	…	…	0.682	…	…
	(0.064)			(0.225)			(0.875)		
Constant	…	…	…	-4.233***	-4.942*	-4.129**	-18.624***	-28.305***	-13.961
				(1.431)	(2.509)	(1.588)	(5.649)	(8.125)	(8.551)
(Pseudo) R-squared	0.26	0.30	0.30	0.31	0.29	0.42	0.41	0.49	0.42
Observations	301	156	145	150	83	67	128	73	55

For probit regressions, marginal effects are reported. Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Predicting Superstars (Research Productivity)

	Top 30 Job (Probit)			Weighted Pub Index (Tobit)		
Female	0.031	-0.000		-0.626	-0.073	-2.298***
	(0.078)	(0.000)		(0.491)	(0.624)	(0.808)
Age 25 Plus	-0.086	-0.006	-0.022	-0.249	-0.779	0.377
	(0.073)	(0.004)	(0.101)	(0.477)	(0.710)	(0.534)
Married	-0.030	-0.000	-0.071	0.930**	1.991***	0.124
	(0.067)	(0.000)	(0.097)	(0.451)	(0.621)	(0.565)
Children	0.064	0.875***	-0.022	-0.306	0.628	-0.290
	(0.122)	(0.061)	(0.122)	(0.614)	(0.969)	(0.669)
RA	0.099	0.650***	0.006	-0.886	0.685	-2.135***
	(0.106)	(0.119)	(0.123)	(0.626)	(0.985)	(0.683)
Full Fellowship	0.219	1.000***	0.122	-0.987	0.366	-2.346***
	(0.176)	(0.000)	(0.176)	(0.723)	(1.111)	(0.868)
Tier 1 PhD	0.263**	0.100*	0.183	1.235*	-0.587	1.956**
	(0.131)	(0.058)	(0.161)	(0.672)	(1.051)	(0.740)
Tier 2 PhD	0.343*	0.428***	0.443*	0.002	-1.020	0.549
	(0.192)	(0.117)	(0.261)	(0.719)	(1.024)	(0.900)
Tier 3 PhD	0.070	...	0.075	0.315	-0.313	0.940
	(0.176)		(0.181)	(0.756)	(1.204)	(0.883)
Ranked Advisor	-0.015	-0.000	-0.047	0.931**	0.845	0.927
	(0.069)	(0.000)	(0.090)	(0.462)	(0.642)	(0.624)
Academic Job				1.167**	0.532	1.949**
				(0.562)	(0.736)	(0.764)
Initial job ranking				-0.004**	-0.001	-0.006**
				(0.002)	(0.003)	(0.002)
1st Job at Phd School				1.326**	1.632**	0.210
				(0.554)	(0.779)	(0.705)
Experience				0.029	-1.778	0.583
				(0.601)	(1.645)	(0.600)
Exp Sq				0.005	0.118	-0.031
				(0.031)	(0.079)	(0.033)
Foreign Undergrad	0.020			-0.617	...	...
	(0.066)			(0.466)		
Foreign*Currently in US				-0.251	...	-0.572
				(0.741)		(0.625)
Constant				-1.221	3.820	-2.370
				(3.099)	(8.606)	(2.862)
Pseudo R-Squared	0.14	0.39	0.13	0.17	0.18	0.28
Observations	132	63	69	132	63	69

For probit regressions, marginal effects are reported. Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%