# Where Do New Ph.D. Economists Go? Recent Evidence from Initial Labor Market*

Jihui Chen† Illinois State University

Qihong Liu‡ University of Oklahoma

Sherrilyn Billger § Illinois State University

March 29, 2013

**Abstract**

We collect data on the 2007-2008 Ph.D. economist job market to investigate initial job placement in terms of job location, job type, and job rank. While there is little gender difference in all three dimensions, our results suggest significant source country heterogeneity in placement outcomes. In an analysis linking job location and job type, we find that, among non-U.S. candidates, foreign placements are more likely to be academic relative to U.S. placements. Our analysis contributes to the literature in two aspects: First, compared to existing studies, our sample consists of all job market candidates from 57 top U.S. economics programs and allows us to conduct an analysis more immune to selection bias. Second, with the increasing presence of international students in the U.S. doctoral programs, we examine a new and growing dimension of the labor market – the international perspective of initial job placements for new Ph.D. economists.

**Keywords:** Ph.D. labor market; Job type; Job location; Job rank

**JEL Codes:** A11, A23, J44

*We thank Leah Brooks, Greg Burge, Jen Graves, John Ham, Cory Koedel, Catherine Mooney, Rati Ram, Adam Rennhoff, and session participants at the 2008 Southern Economic Association Annual Conference and Illinois State University Applied Econometrics Workshop participants for helpful comments and suggestions. We also thank Meredith Willinger, Yoonho Choi, Chris Denly, Hojin Jung, Golaleh Moshrefi, and Collin Phillips for their excellent research assistances, and University of Oklahoma Honors Research Assistant Program for financial support. Finally, we would like to thank placement coordinators and other individuals at various institutions who exchanged correspondences with us during the course of this project. The usual caveat applies.

†Department of Economics, Illinois State University, Normal, IL 61790. E-mail: jchen4@ilstu.edu. Phone: (309) 438-3616.

‡Department of Economics, University of Oklahoma, Norman, OK 73019. E-mail: qliu@ou.edu. Tel: (405) 325-5846.

§Department of Economics, Illinois State University, Normal, IL 61790. E-mail: smbillg@ilstu.edu . Phone: (309) 438-8720 .

# 1 Introduction

In this paper, we study the relationship between candidate characteristics and job market outcomes, using data on 578 new Ph.D. economists in the 2007-2008 job market. Our contributions are two-fold. First, we have assembled a comprehensive sample from 57 top economics programs (Appendix Table A.1), which allows us to conduct an analysis less prone to selection bias relative to existing studies. Second, with the increasing presence of international students in the U.S. doctoral programs,[1] our analysis adds an important new dimension to the literature: the international perspective (i.e., in the U.S. or not) on initial job placements for new Ph.D. economists. In particular, we investigate the effects of candidates' country of origin on placement outcomes.

The extensive literature on the economist labor market focuses on initial placement or job conditions across all tenure lengths.[2] These studies show that job outcomes vary with demographic characteristics (e.g., gender and nationality), academic characteristics (e.g., grades, GRE scores, advisor reputation, and research portfolio), and program characteristics (e.g., the rank and size of a doctoral program). Our paper builds upon the existing studies in several ways.

Due to the labor-intensive data collection process, existing studies usually focus on a handful of top-ranked programs or use data collected from the AEA Membership directory or surveys with low response rates.[3] In recent years, the information on job candidates and placement outcomes has become more accessible to researchers, as many programs advertise their candidates and placements on the internet. By including a total of 57 top economics programs, it reduces potential selection bias in our sample. Ideally, one would prefer a more comprehensive sample with multi-year data. Yet, such a multi-year sample is still undesirable as candidates and market conditions vary from one year to another. While panel data is generally preferable, our study is nonetheless sound because multiple years of data would be a stacked cross-section, since candidates differ across years. Note that our main findings are interpreted relative to the reference group. Thus, as long as there is little variation in candidate composition (e.g., male vs. female and domestic vs. foreign students) over time, we should expect similar impacts of candidate characteristics on job market outcomes. Furthermore, the strength of job market presumably affects job market outcomes, but if their impacts are comparable across candidates (e.g., male vs. female), then the empirical results will be similar across years.

Our data confirm findings in existing studies (e.g., Siegfried and Stock, 2004) that international students represent an increasing portion of the doctoral programs in economics in the U.S. Con-

[1] Source: http://www.nsf.gov/statistics/showpub.cfm?TopID=2&SubID=25.

[2] Coupe (2004) and Ehrenberg (2004) provide excellent surveys of this literature. Other studies focus on the success of completing the Economics Ph.D. (Siegfried and Stock 2001; Stock and Siegfried 2006a; Grove, Dutkowsky and Grodner 2007).

[3] For example, Krueger and Wu (2000), Oyer (2006), Athey et al. (2007), and Grove and Wu (2007) use a handful of top programs. McMillen and Singell (1994) and McDowell, Singell and Ziliak (1999, 2001) use AEA membership directory data. Most other studies use survey data, including Barbezat (1992), Neumark and Gardecki (1998), Siegfried and Stock (1999, 2004), Stock and Siegfried (2001), and Gallet et al. (2005).

sequently, we focus our analysis on the international aspect of initial job placements in two ways. First, we use candidates' country information extensively to explain job market outcomes and we interact it with gender as well.[4] Second, we introduce job location (within the U.S. or outside) as a new dimension of job market outcomes, in addition to job type and job rank.[5] The U.S. labor market has become more saturated in recent years, partially fueled by a weak economy. This saturation, coupled with the increased prestige of many international universities, has led a number of Ph.D.s (particularly foreign-born) to pursue employment outside the U.S. In our data, 37% (146 out of 395) of the foreign candidates are placed outside the U.S. Therefore, it becomes increasingly important to document the patterns of job placements in terms of geographic location. On one hand, it measures a major source of supply in the labor market of U.S. and foreign fresh economist Ph.D.s. On the other hand, a candidate's investment in human capital should adjust to better match their future job location. Currently, the prominent job search manuals (e.g., Cawley, 2011) are almost exclusively based on the U.S. market, but it appears that the global market should also be considered.

In this paper, we pose the following research question: where do new Ph.D. economists go? In particular, we examine three important elements of initial job placements: job location (within or outside the U.S.), job type (academia, government, or private sector) and job rank.

Our analysis indicates significant source country heterogeneity. In the job location analysis, we introduce a set of country/region dummies to account for the considerable disparities arising in the sample (more details can be found in Section 5.1). For example, *ceteris paribus*, candidates from Argentina and India are most likely to work in the U.S. upon graduation, while Korean students are the least likely to stay. Furthermore, significant country/region heterogeneity also rises in the analysis linking job type and job location. For example, we find that, among international students, U.S. placements are less likely to be academic than foreign placements. This correlation becomes significant and much stronger (7%–13.4%) when Korean candidates are excluded.

In line with previous studies (e.g., McDowell, Singell and Ziliak, 1999, 2001; Broder, 1993), we also find diminishing gender difference in initial job placement. In both job location and job rank analyses (except for one model specification), gender differences are statistically insignificant. However, we find some evidence of gender difference in placement outcomes.[6] For example, *ceteris paribus*, females are 7.6% less likely to be placed into academic jobs relative to male candidates.

The remainder of the paper is organized as follows. Section 2 offers a review of the related

[4] The existing literature studies the role of gender extensively, but not the role of source country heterogeneity. When country heterogeneity is considered, typically a single country dummy (i.e., the U.S.) is used. There are few exceptions (Krueger and Wu, 2000; Grove, Dutkowsky and Grodner, 2007) using a combination of country and continent dummies. Our analysis provides a more careful exploration across many countries.

[5] In existing studies, job location, if considered, usually refers to regions within the U.S.

[6] Note that this gender difference does not necessarily reveal gender discrimination. For example, Barbezat (1992) documents significant gender differences in their preferences for jobs types. On the other hand, McMillen and Singell (1994) find no significant gender difference in sector choice probabilities (employee preference), but the marginal effect of several productive attributes is smaller for women than for men (employer discrimination).

literature. We discuss our data in Section 3 and provide descriptive statistics results in Section 4. Section 5 contains the main estimation results on job type, job location, and job rank. We conclude in Section 6. A list of variables appears in Appendix *A*.1.

## 2 Literature review

Our paper is most closely related to studies on initial job placement of new Ph.D. economists (Siegfried and Stock 1999, 2004; Stock and Siegfried 2001, 2006b). Several studies analyze the type of initial job placements and/or starting salary. Barbezat (1992) is among the first to study the labor market for new economists. In addition to CVs, she also surveys about 600 candidates (with 291 usable responses) in the top 46 Economics programs in the 1988-1989 market. While our analysis also relies on candidates' CVs, much has changed since the Barbezat study, allowing us to offer an updated understanding of recent doctoral education outcomes.

In a series of papers, Siegfried and Stock (1999; 2004) and Stock and Siegfried (2001) also investigate initial job placements. Siegfried and Stock (1999) conduct an interesting survey of economics Ph.D. graduates to explore initial job placement and job satisfaction, highlighting differences across employment sectors. They document different placement rates among various sub-fields and background characteristics, such as whether the candidate completed a master's degree prior to starting a Ph.D. program (we also include this variable in our analysis). Stock and Siegfried (2001) survey the 1996-1997 cohort of Ph.D. economists and investigate job type and salary. In an updated version, Siegfried and Stock (2004) provide an array of summary statistics as a snap-shot of the 2001-2002 graduating class. They highlight the influx of international workers, salary differences across sectors, and job satisfaction distributions by sector and Ph.D. program ranking.

McMillen and Singell (1994) use the AEA Membership Directory and focus on the role of gender in job search. They conduct the analysis using subsamples of each gender, and conclude that pre-market differences in attributes do not fully explain the post-market gender discrepancies in job placement. Their findings of gender differences could stem from either the employer side (discrimination) or the candidate side (candidates' preferences).[7] An earlier study, Moore and Newman (1977) also document significant quality differentials in academic placements between genders. Focusing on a cohort of economists during 1960-1974, they attribute males' overall advantage over females to gender discrimination.

Other studies are concerned with mentorship configurations in terms of gender and their impact on job placement outcome.[8] For example, Neumark and Gardecki (1998) survey various programs

[7] Results in Barbezat (1992) Table 6 indicates significant gender differences in how they value certain workplace characteristics.

[8] Aside from initial job placements, intermediate job search outcomes are also analyzed in this literature (Stock and Alston, 2000; Gallet, List and Orazem, 2005). Another strand of the literature analyzes later career outcomes. Much of the focus is on gender gap, for example, Kahn (1995), McDowell et al. (1999, 2001), Ginther and Hayes (2003), and Kolpin and Singell (1996).

for their female graduate students. They find that neither the number of female faculty in the department nor the gender of dissertation chair affects the quality of female students' first job placement. Hilmer and Hilmer (2007) extend this analysis by including male graduate students and analyzing research productivity during the doctoral program, in addition to placement quality. They find that female students working with male advisors are more likely to accept research-oriented jobs than male students with male advisors upon graduation.

Finally, several studies investigate the determinants of placement quality.[9] Using a sample consisting of 1,029 graduate students who enrolled in the top five economics programs in the 1990s, Athey et al. (2007) find that, conditional on first-year grades, neither demographic characteristics, nor GRE scores, nor an additional master's degree seems to affect the quality of job placement. Using data on applicants to a top 5 Economics program in 3 selected years, Krueger and Wu (2000) examine the relationship between admission to graduate program and the subsequent outcome of job placement, and argue that subjective ratings of admission committee and objective GRE scores are effective signals of professional success.

# 3 Data

To capture most candidates on the Ph.D. economist job market, we include 57 top U.S. economics programs in our sample (Appendix Table A.1). Due to the nature of the job search process, our data collection involved two steps. First, in November 2007, we obtained a total of 617 candidates' CVs from each program's placement web page.[10] From these CVs, we extracted the candidate and program characteristics variables, which are described in Appendix $A.1$. The second step started in fall 2008 when we collected candidates' placement information.

Focusing on initial job placements in the 2007-2008 market, we screen the candidates using two criteria: (1) it should be the candidate's first time on the job market, and (2) it should be his/her first job placement. As a result, the sample size is reduced to 578. Some programs list the placement outcomes online. For the remaining candidates, we conducted extensive online searches through which the placement outcomes for most candidates were confirmed. In cases where the internet search failed, we directly contacted their program placement directors/coordinators, advisors, faculty members and sometimes other students in the same department for a definitive answer. We were able to confirm all placement outcomes in our final sample. Only 19 candidates were not placed as of fall 2008

Our final sample includes a total of 578 candidates. While this is not an exhaustive list of all the

[9] Several studies examine related issues in other academic markets. For example, Zamudio et al. (2011) study matching outcomes between candidates and departments in marketing, and Ginther and Hayes (2003) identify significant gender differences in promotion for humanities professors which result in gender differences in salary.

[10] It is possible that a listed job market candidate may later choose not to proceed and stay in the program one more year. Our data seem to confirm this possibility. It is also possible but less likely that a late candidate may enter into the market after mid-November for jobs starting the following year.

job candidates in the year 2007-08, the sample is relatively representative of candidates (including both new Ph.D.s and ABDs) who participated in the initial job search, since 57 of the top programs are included. More details are provided in Section 4.

# 4 Descriptive analysis

Our data include the following information for each candidate:[11] (1) demographic information including gender and citizenship; (2) academic information including characteristics of the candidate's Ph.D. program and advisor(s),and whether s/he has a previous master's degree, teaching awards, or had journal publication or revise and resubmit; and (3) placement information including whether the candidate is placed successfully and if yes, the type, location and rank of job placement. Now we turn to descriptive statistics of each category. Refer to Appendix $A.1$ for variable definitions.

Demographic characteristics: Table 1 lists the gender composition of the sample. About 1/3 of the candidates (199/578) are female and this ratio is roughly the same across program tiers.[12] We also report the ratios of international candidates across doctoral program tiers. In Table 1, the fraction of foreign students is inversely U-shaped in program ranking, with Tier 1 and Tier 4 admitting a relatively lower percentage of foreign students than the middle tiers (tier 2 and 3) do.

Academic characteristics: Table 2 reports the summary statistics for academic characteristics. All variables except *size* are dummy variables. About half of the candidates have a master's degree prior to entering the doctoral program. All the candidates in the sample earn an average of 0.26 teaching award. Finally, the average program size, defined as the number of candidates on the job market, ranges between 1 and 32.

Placement characteristics: *Stayus* is defined as the candidate accepts a job in the U.S. while *Return* refers to the case where the candidate accepts a job in his/her home continent.[13] As almost all U.S. students take a job in the U.S., we thus exclude American students when reporting the results in Table 3, as well as those who fail to find a job, leaving us a subsample of 395 students.

Table 3 reports the fraction of students staying and the fraction returning, separated by gender, program tier, and continent respectively. About 63% of foreign students accept jobs in the U.S., and this ratio varies slightly across gender (female 69% vs. male 60%) and program ranking (tiers 1 and 4 slightly higher than tiers 2 and 3). Approximately 23% of

[11] Appendix Table A.2 reports the detailed distribution of country origin, female, and job placement location by country/region.

[12] Refer to Appendix Table B for detailed gender composition by country/region.

[13] These two outcomes coincide with each other for U.S. candidates. For candidates from other continents, they are not perfectly correlated since a foreign student can be placed into a country outside U.S. and his/her home continent.

foreign female candidates return to their home continents, compared to 31% for foreign male students, while the return ratios are higher for tiers 2 and 3 than for the other two tiers. When broken down by continents, we find that Middle East has the highest ratio of staying in the U.S., or 81%, with other continents in the vicinity of 60%, except for Africa. In terms of return-to-home-continent ratios, Mideast, Latin America, and Africa rank the lowest three, in such order.

Table 4 reports the types of the initial jobs taken by the Ph.D.s (including U.S. candidates) in our sample. As one would expect, a considerable number of students (309 or about 55%) are placed into (tenure-track) academic positions, followed by the private sector (125 or about 22%). 14% of candidates find government jobs (e.g., Federal Agencies and regional central banks) and the remaining 48 candidates (9%) find temporary jobs (e.g., postdoc and visiting positions). Across gender, female candidates are less likely than males to be placed into academic jobs (49% vs. 59%) and the result is reversed for the private sector (27% vs. 20%). There is little difference across program tiers, but more prominent differences exist across continents.

# 5 Estimation results

In the previous section, we discuss descriptive statistics on the composition of candidates by home nation/continent, gender, program ranking, and their placement in terms of location (stay or return) and type. Next, we present a variety of regression results to explore how various candidate characteristics affect their placement outcomes.

## 5.1 Job location

The U.S. job market for economists is obviously impacted by the health of the overall economy. Decades ago, we might have expected most international students to try to stay in the U.S., but that is no longer obvious. Some other economies (e.g. China) have been booming and job candidates are increasingly attracted there. We therefore explore the factors that contribute to whether an international candidate stays in the U.S. or takes a job in another country. Approximately one third of our sample are candidates from the U.S. and they are placed within the U.S. with very few exceptions. Including Americans in the location analysis would significantly affect the results, so we exclude them from this analysis. We also exclude the candidates without jobs for obvious reasons. However, we include those placed to temporary jobs as they may indicate candidates' location preferences.[14] The final subsample used for this location analysis includes 395 foreign candidates.

We first explore whether international candidates stay in the U.S. The dependent variable *Stayus*

[14] The results are qualitatively the same if we exclude temporary jobs.

is equal to 1 if the candidate takes a U.S. job and 0 otherwise. Due to extensive heterogeneity across countries within a given continent, a seemingly better choice is to use selective country dummies. We use two criteria in selecting these countries. The first criteria is the number of candidates from that country in our sample. The second is the GDP of the candidate's home country/region. There is a lot of overlap in these two criteria and in the end we choose the following countries/regions: *China, India, Korea, Russia, Turkey, Japan, Italy, Taiwan, Argentina.*

Probit estimation results are presented in Table 5. Model (1) is the baseline specification, and models (2) and (3) include interaction terms between gender and country, and between gender and program ranking, respectively. In all three models, we find significant source country heterogeneity in job outcomes. Some of the patterns we observed in the descriptive statistics results remain. For example, compared to the reference group, candidates from Argentina and India are most likely to work in the U.S. upon graduation, while Korean students are the least likely to stay. In addition, we have some evidence that candidates from China and Turkey are more likely to stay in the U.S. while those from Italy are less likely to stay, relative to the reference group. However, there seems to be no statistically significant gender difference in job placement location.

Moving on to other candidate characteristics, candidates are about 10% less likely to stay if they had obtained a separate master's degree prior to joining the doctoral program. Relative to candidates from Tier 1 programs, those from lower-ranked programs are at least 28% less likely to stay in the U.S.[15] The marginal effects of program quality are robust across specifications, suggesting that program quality is an important determinant of job location, perhaps through access (or lack thereof) to job networks.

### 5.2 Job type

Next, we explore the likelihood of securing one of the four job types: academia, government, private sector, or temporary. Recall that visiting positions and postdocs are included in temporary jobs, not academic jobs. We estimate these probabilities using a multinomial logit model. The dependent variable equals 1 if the candidate takes a job in academia, 2 if in government, 3 if in private sector, and 4 if it is a temporary position. This analysis uses a sample of 559 candidates who are placed successfully (including American students).

Table 6 reports the results from multinomial logit regressions, incorporating candidate characteristics such as gender, home country/region, and program ranking, among other variables. For brevity, we do not report the estimates for temporary jobs in Table 6. Examining gender, we see that females are 7.6% less likely than males to obtain academic jobs. In contrast, we observe no gender difference in placing neither in the government nor private sector.[16]

[15] Our results suggest that candidates from Tier 4 programs are more likely to stay in the U.S. than those from Tier 2 and 3 programs. That is, the relationship between job location and program ranking is U-shaped. One may speculate that foreign placements are better fits for candidates in the two middle tiers than the top and bottom tiers.

[16] In addition to this baseline specification, we also introduce interaction terms to investigate the gender difference

Moving on to country/region dummies, we find substantial variation among international students. Relative to the reference group of all other countries, candidates from China and Korea are less likely to work in academia, while those from Japan and Taiwan are more likely. In columns (2) and (3), those from China and Korea more likely to find private sector jobs, and those from China, India, Russia, and Taiwan are less likely to work for the government.

Candidates from larger programs are more likely to work for the government and less likely in academia. Our results suggest that candidates with a top-four journal publication are about 32.3% more likely to be placed into academia, followed by government jobs, and are least likely to be placed into the private sector. The same pattern holds for candidates with a publication in journals ranked 5 through 50, but to a lesser extent. Having a top-four R&R reduces a candidate's likelihood of being placed into the private sector, while having a R&R in journals ranked 5 through 50 reduces the likelihood of being placed into government jobs.

### 5.3 Linking job type and job location

In this section, we investigate the potential correlation between candidates' job types and their job locations. Since almost all U.S. candidates stay in the U.S., we exclude the citizens from this analysis. We focus on permanent jobs and combine private sector and government jobs into nonacademic jobs.

Let us first offer some stylized facts in the sample. Among foreign candidates who stay in the U.S., 128 and 90 are placed into academic and nonacademic jobs, respectively, implying a ratio of $\frac{128}{128+90} \approx 59\%$ for academic placement in the U.S. For those who leave the U.S., the ratio of academic placement is $\frac{87}{87+51} \approx 63\%$. Relative to those who stay in the U.S., candidates who leave are more likely to be placed into academic jobs. The difference of about 4% is rather small. However, upon exploring the data more closely, we notice that Korean candidates behave drastically differently from others. Interestingly, the ratio of academic placements outside the U.S. increases significantly when Korean candidates are excluded.

Why are foreign placements more likely to be in academia than U.S. placements? One possible explanation is as follows. The criteria for success in academic jobs such as research publication is more universal, and candidates with a Ph.D. from the U.S. have advantages over local candidates. For nonacademic jobs, this advantage is likely to diminish or may even vanish, partly due to the abundant local labor supply. Next, we formally test whether or not foreign placements are more likely to be academic than U.S. placements.

In Table 7, we use Probit estimation where the dependent variable *academicjob* is defined as 1 if a foreign candidate is placed into academia and 0 otherwise. The variable *stayus* is used as an

within a specific country and within a program tier. Our main results remain qualitatively unchanged. Results are available from the authors upon request.

explanatory variable.[17] To investigate source country heterogeneity, we introduce country/region dummies in model (2) and both *country* and *country* − *stayus* interaction terms in model (3). Consistent with the previous findings, we again observe significant heterogeneity across countries. In model (3), the interaction term is positive and significant only for *koreastay*. For Korean candidates, the sum of the coefficients of *stayus* and *koreastay* is $-0.075 + 0.404 > 0$, suggesting that Korean candidates who stay in the U.S. are more likely to be placed into academia.[18] Why are the results different for Korean students? Anecdotally, we learned from several Korean economists that some Korean economics Ph.D. students are financially sponsored by various entities in Korea and are usually required to return to Korea after graduation. We then exclude Korean candidates and re-run models (1)-(3). The results are listed in (4)-(6) of Table 7. We can now see that the coefficient for *stayus* is negative and significant in models (4) and (5) but remains insignificant in model (6).[19]

### 5.4 Job rank

Next, we regress job rank on candidates' demographic and academic characteristics. We use the Kalaitzidakis, Mamuneas, and Stengos (2003) ranking (their Table 3) to rank academic jobs from 1 to 200 (lower ranks connote better jobs). Following Krueger and Wu (2000), we give the rank of 40 to top government jobs (e.g., IMF, World Bank, and Federal Reserve Banks) and the rank of 120 to top consulting jobs (e.g., Abt, NBER, and Rand). All remaining jobs are assigned the rank of 300. Placement in a business school is assigned five ranks better, or minus five (Krueger and Wu, 2000).[20] Table 8 reports the estimation results from a Tobit model where the dependent variable is *jobrank*. In these regressions, we focus on candidates who have found a permanent job in one of the three sectors, and exclude those with temporary positions. These criteria lead to a subsample of 511 observations, including Americans and international students.

From Table 8, our results in model (1) suggest no gender difference in job placement rank. The gender difference increases to 29.502 and becomes significant for the reference group in model (2) where we include gender-country interactions. The estimates for program tiers have the right sign and relative magnitude, i.e., lower tier programs are related to worse placement rank in both

[17] There is potential endogeneity problem using *stayus* as the explanatory variable as unobserved heterogeneity in the candidates may affect both decisions to choose between academic and non-academic and to choose between stay and return. However, with only a single year data, it is difficult to find good instrument variables to account for this endogeneity issue.

[18] This can be easily confirmed by looking at the raw data of Korean candidates. 11 of the 13 who stay in the U.S. find jobs in academia and only 2 go to the private sector. For those who leave the U.S., 3, 8 and 11 are placed to academia, government, and private sector, respectively.

[19] We also run multinomial logit estimation similar to that in Section 5.2 but with variable *stayus* and country-stay interaction terms. The results are qualitatively similar to the probit estimation results here. The estimate for *stayus* is always negative but may be insignificant. The country-stay interaction terms are all negative except for Korea. Details are available upon request.

[20] Our job rank analysis follows Krueger and Wu (2000) closely. Other studies have adopted more crude measure of job rank to compare gender differences. For example, McMillen and Singell (1994) divide placements into top 50 economics department and other departments. Barbezat (1992) divide employment into top 15, 16-30, and other economics departments, respectively.

models. Comparing models (1) and (2), the most striking feature is probably the sharply different results in their estimates for country dummies. In particular, almost no country/region dummy has a significant coefficient in model (1) while almost all are significant in model (2). In model (1) for example, our results suggest that candidates from China are likely to be placed into worse-ranked jobs relative to the reference groups. Note that this comparison considers gender in both groups. In contrast, results in model (2) provide separate comparisons for male and female candidates. Relative to other male candidates, Chinese male candidates' placement is worse by 96.775 ranks. On the other hand, relative to female candidates in the reference groups, Chinese female candidates' placement improves by $128.458 - 96.775 = 31.683$ ranks. The results for other countries are similar, the country fixed effects have different signs for males and females. This is confirmed in models (4) and (5), where we divide the sample into two subsamples by gender and re-run model (1) separately for each sample. We can see that the country fixed effects have mostly different signs between model (4) (female) and model (5) (male). On the other hand, the similarity between results in model (1) and (3) suggests that there is little gender heterogeneity across program tiers.

# 6 Conclusion

Using data on new Ph.D. economists in 2007-2008, we explore the relationships between candidate demographic/academic characteristics and job placement outcomes, as measured by type, location, and rank. Demographic characteristics include gender, nationality, and academic characteristics. Consistent with previous studies (e.g., McDowell, Singell and Ziliak, 1999, 2001; Broder, 1993), our results suggest no significant gender differences across all three dimensions of initial job placement. However, we identify significant source country heterogeneity in placement outcomes. For example, candidates from Korea are more likely to leave the U.S., while candidates from Argentina and India are more likely to stay.

Focusing on international candidates, we also investigate the link between job location and job type. Our analysis suggests that foreign placements are more likely to be academic than nonacademic. The criteria for success in academic jobs such as research publication is more universal, and candidates with a Ph.D. from the U.S. may have advantages over local candidates. For nonacademic jobs, this advantage is likely to diminish or may even vanish, partly due to the abundant local labor supply.

This paper contributes to the literature on the link between job characteristics and individual characteristics. In particular, we focus on the international dimension of new Ph.D. economists' initial job placements. Thus, our analysis is a first attempt to explore this new perspective for potential employers and graduate programs/students. We recommend further investigation into the effect of job location (within and outside the U.S.) on the profession – in particular, how differences in American and other labor markets impact job placement outcomes.

It should be noted that our analysis is based upon placement outcomes from a single-year. Our sample is not fully exhaustive of that particular job market, though a collection of 57 programs is more comprehensive than the data used in existing studies. In future work, a more thorough appraisal of initial job placements may include (1) the evaluation of recommendation letters and of teaching abilities and (2) multiple years of data to reflect fluctuations in this job market over time. Furthermore, having multiple years of data would also alleviate endogeneity in linking job type and location by introducing valid instrument variables (IVs).[21]

[21] For example, the previous year's GDP of each placement country might be appropriate to use as an IV in a multi-year analysis. One would assume that the demand for new Ph.D. economists in a country, to some extent, depends on its GDP from the previous year, especially in the U.S. where these graduates are produced.

# A Appendix

## A.1 Variable definitions

(1) Demographic characteristics.

- Gender: We define a dummy variable, *female*, as 1 if the candidate is a female and 0 otherwise.
- Country/region: We define a set of country/region dummy variables as 1 if the candidate comes from that country/region and 0 otherwise. They include *Argentina, China, India, Italy, Japan, Korea, Russia, Taiwan, Turkey, US.*

(2) Academic characteristics.

- Additional Master Degree: We define a dummy variable, *addmaster*, as 1 if the candidate earned a master's degree prior to entering doctoral training and 0 otherwise.
- Advisor: To control for the effectiveness of recommendation letters, we refer to Tom Coupe's index of top economists.[22] We define a dummy variable, *topadvisor*, as 1 if the advisor and/or the co-chair is ranked top-50 economists worldwide and 0 otherwise. The underlying assumption is that the more prominent the letter writer is, the recommendation letter will likely yield better job placement (Grove and Wu, 2007).
- Top Publications: We use the journal ranking by Kalaitzidakis, Mamuneas, and Stengos (2003) to define two top journal variables.[23] First, following Grove and Wu (2007), we use *top4journal*, defined as 1 if the candidate has at least one of the top four economics journals (i.e., *American Economic Review (AER)* (excluding *Papers and Proceedings*), *Quarterly Journal of Economics (QJE)*, *Journal of Political Economy (JPE)*, and *Econometrica*), and 0 otherwise. There are only 8 candidates with at least one top four journal publication at the time of application in the sample. Second, we define *top5-50j*, which is defined as one if the candidate has at least one publication in a journal ranked between 5 and 50. A total of 29 candidates have at least such a publication.
- Revise and Resubmit (R&R): To be consistent with the variables used for publications, we define two similar quality indicators for R&Rs, using the Kalaitzidakis, Mamuneas, and Stengos (2003) ranking. First, we define a dummy variable, *top4rr*, as one if the candidate has at least one revision and resubmission in a top four journal, and zero otherwise. Second, we define a dummy variable, *top5-50rr,* as one if the candidate has at least one R&R in a journal

[22] The list of top 1000 economists is available upon request (Source: http://student.ulb.ac.be/~tcoupe/update/top1000p.html. Accessed February, 2009).
[23] The full list of the journal ranking is available upon request.

ranked between 5 and 50. At the time of job application in the sample, 3 of them have a top-four R&R, and 18 have a R&R in journals ranked 5 through 50.

- Teaching Awards: This variable measures the number of teaching awards that the candidate receives while in the Ph.D. program.

- Program Ranking: Following Buchmueller et al. (1999), we define four dummy variables for graduate program tiers. Tier 1 (*tier1*), Tier 2 (*tier2*), Tier 3 (*tier3*) and Tier 4 (*tier4*) refer to programs ranked 1 to 6, 7 to 15, 16 to 30, and beyond 30, respectively.[24] The variable *tier4* is omitted as the reference category in the analysis.

- Program Size: We define *size* as the total number of candidates in the program on the same job market. This variable indicates competition within the program. For instance, in larger programs, candidates face more competition from their peers with the same degree credentials. On the other hand, a larger program is more likely to offer candidates a wider network in the job market, likely facilitating their job search.

(3) Placement Characteristics

- Job Location: We define two variables regarding job location. *Stayus* is defined as 1 if the student accepts a job in the U.S. and 0 otherwise. *Return* is defined as 1 if the student accepts a job in his/her home continent and 0 otherwise. We only include foreign candidates when considering job location.

- Job Type: We divide all jobs into four types: Academia, Government, Private Sector, and Temporary Job (i.e., a visiting position or a postdoc position). *Academia, Gov't*, *Private*, *Temp* is defined as one if a person is placed in academia, Government, Private Sector, and Temporary Job, respectively, and zero otherwise.

  In Section 5.3.2, *academicjob* is defined as 1 if a foreign candidate is placed into academia and 0 if s/he is placed into the government or the private sector.

- Job Ranking: We use the Kalaitzidakis, Mamuneas, and Stengos (2003) ranking to rank academic jobs from 1 to 200 (the lower the number, the better the job is ranked). A placement in a business school is given an extra five ranks, or minus five. Using a methodology similar to the one used in Krueger and Wu (2000), we give the rank of 40 to top government jobs (e.g., IMF, World Bank, and Federal Reserve Banks) and the rank of 120 to top consulting jobs (e.g., Abt, NBER, and Rand). For all the remaining jobs, we give the rank of 300. As discussed in Krueger and Wu (2000), such a ranking system is highly subjective but as we will show later, our findings are robust to different ranking systems. Therefore, candidates

[24] Some institutions offer economics programs both in the business school and the college of arts and sciences. We treat them as different programs but give them the same rank. The list of all programs included in our sample is available upon request.

with unranked jobs are treated as censored observations, with the censoring point at the rank of 300.

## References


[1] Athey, S., L. Katz, A. Krueger, S. Levitt, and J. Poterba (2007). "What Does Performance in Graduate School Predict? Graduate economics Education and Student Outcomes," *AEA Papers and Proceedings*, 97(2), 512-518.

[2] Barbezat, D. (1992). "The Market for New Ph.D. Economists." *Journal of Economic Education,* 23(3), 262-276.

[3] Broder, I. (1993). "Professional Achievements and Gender Differences among Academic Economists." *Economic Inquiry,* 31(1), 116-127.

[4] Buchmueller, T., J. Dominitz, and W. Hansen (1999). "Graduate Training and the Early Career Productivity of Ph.D. economists," *Economics of Education Review*, 14, 65-77.

[5] Cawley, J. (2011). "A Guide (and Advice) for Economists on the U. S. Junior Academic Job Market."

[6] Ehrenberg, R. (2004). "Econometric studies of higher education." *Journal of Econometrics* 121, 19-37.

[7] Coupe, T. (2004). "What Do We Know about Ourselves? On the economics of economics," *Kyklos*, 57, 197-216.

[8] Gallet, C., J. List and P. Orazem (2005). "Cyclicality and the Labor Market for Economists," *Southern Economic Journal*, 72(2), 284-304.

[9] Ginther, D., and K. Hayes (2003). "Gender Differences in Salary and Promotion for Faculty in the Humanities 1977-95," *Journal of Human Resources*, 38(1), 34-73.

[10] Grove, W., D. Dutkowsky and A. Grodner (2007). "Survive Then Thrive: Determinants of Success in the economics Ph.D. Program," *Economic Inquiry*, 45(4), 864-871.

[11] Grove, W. and S. Wu (2007), "The Search for Economics Talent: Doctoral Completion and Research productivity," *AEA Papers and Proceedings*, 97(2), 506-511.

[12] Hilmer, C., and M. Hilmer. (2007). "Women Helping Women, Men Helping Women? Same-Gender. Mentoring, Initial Job Placements, and Early Career Publishing," *AEA Papers and Proceedings* 97(2), 422-426.

[13] Kahn, S. (1995). "Women in the Economics Profession." *Journal of Economic Perspectives* 9(4), 193-206.

[14] Kalaitzidakis, P., T. Mamuneas, and T. Stengos (2003). "Rankings of Academic Journals and Institutions," Working Papers 2003-8, University of Guelph, Department of Economics.

[15] Kolpin, V., and L. Singell, Jr. (1996). "The Gender Composition and Scholarly Performance of economics Departments: A Test for Employment Discrimination," *Industrial and Labor Relations Review*, 49(3), 408-423.

[16] Krueger A. and S. Wu (2000). "Forecasting Job Placements of Economics Graduate Students," *Journal of Economic Education*, winter, 81-94.

[17] McDowell, J., L. Singell, Jr., and J. Ziliak (1999). "Cracks in the Glass Ceiling: Gender and Promotion in the economics Profession," *AEA Papers and Proceedings*, 89(2), 392-396.

[18] McDowell, J., L. Singell, Jr., and J. Ziliak (2001). "Gender and Promotion in the economics Profession," *Industrial and Labor Relations Review*, 54(2), 224-244.

[19] McMillen, D., and L. Singell, Jr. (1994). "Gender Differences in First Jobs for economists," *Southern Economic Journal*, 60(3), 701-704.

[20] Moore, W. J., and R. J. Newman (1977). "An Analysis of the Quality Differentials in Male-Female Academic Placements," *Economic Inquiry*, July, 15(3), 413-434.

[21] Neumark, D. and R. Gardecki (1998). "Women helping women? Role model and mentoring effects on female PhD students in economics." *Journal of Human Resources,* 33(1), 220-246.

[22] Oyer, P. (2006). "Initial Labor Market Conditions and Long-Term Outcomes for economists," *Journal of Economic Perspectives*, 20(3), 143-160.

[23] Siegfried, J. and W. Stock (1999). "The Labor Market for New Ph.D. economists," *Journal of Economic Perspectives*, 13(3), 115-134.

[24] Siegfried, J. and W. Stock (2001)."So you want to earn a Ph.D. in Economics: How Long Do You Think it Will Take?" *Journal of Human Resources,* 36(2), 364-378.

[25] Siegfried, J. and W. Stock (2004). "The Market for New Ph.D. economists in 2002," *AEA Papers and Proceedings*, 94(2), 272-285.

[26] Stock, W. and R. Alston (2000). "Effect of graduate-program rank on success in the job market." *Journal of Economic Education,* 31(4), 389-401.

[27] Stock, W. and J. Siegfried (2001). "So you want to earn a Ph.D. in Economics: How much do you think you'll make?" *Economic Inquiry,* 39(2), 320-335.

[28] Stock, W. and J. Siegfried (2006a). "Time-to-Degree for the Economics Ph.D. Class of 2001–2002," *AEA Papers and Proceedings.*

[29] Stock, W. and J. Siegfried (2006b). "Where Are They Now? Tracking the Ph.D. Class of 1997." *Southern Economic Journal,* 73(2), 473-488.

[30] Zamudio, C., Y. Wang, and E. Haruvy (2011). "Two-Sided Matching in the Job Market for Assistant Professors in Marketing," *working paper.*

Table 1. Female and Foreign student Ratios by Program Ranking

| Program Ranking | Total | Female | Female Ratio | Foreign | Foreign Ratio |
|---|---|---|---|---|---|
| Tier1 | 136 | 46 | 34% | 83 | 61% |
| Tier2 | 115 | 40 | 35% | 90 | 78% |
| Tier3 | 174 | 60 | 34% | 131 | 75% |
| Tier4 | 153 | 53 | 35% | 105 | 69% |
| Total | 578 | 199 | 34% | 409 | 71% |

Table 2. Summary Statistics of Academic Characteristics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Addional master degree | 578 | 0.51 | 0.50 | 0 | 1 |
| Topadvisor | 578 | 0.04 | 0.21 | 0 | 1 |
| top4j | 578 | 0.01 | 0.12 | 0 | 1 |
| top5-50j | 578 | 0.05 | 0.22 | 0 | 1 |
| top4rr | 578 | 0.01 | 0.07 | 0 | 1 |
| top5-50rr | 578 | 0.03 | 0.17 | 0 | 1 |
| Teaching awards | 578 | 0.26 | 0.61 | 0 | 4 |
| Size | 578 | 14.19 | 7.52 | 1 | 32 |

Table 3. Foreign Students' Stay In the U.S. and Return-to-Home Continent Ratio

| | Total | Stay | ratio | return | ratio |
|---|---|---|---|---|---|
| overall | 395 | 249 | 63% | 113 | 29% |
| | | | | | |
| by gender | | | | | |
| male | 254 | 152 | 60% | 80 | 31% |
| female | 141 | 97 | 69% | 33 | 23% |
| | | | | | |
| by program tier | | | | | |
| tier1 | 83 | 63 | 76% | 20 | 24% |
| tier2 | 88 | 52 | 59% | 27 | 31% |
| tier3 | 122 | 70 | 57% | 42 | 34% |
| tier4 | 102 | 64 | 63% | 24 | 24% |
| | | | | | |
| by continent | | | | | |
| Africa | 7 | 3 | 43% | 1 | 14% |
| Asia | 194 | 117 | 60% | 53 | 27% |
| Australia | 8 | 5 | 63% | 2 | 25% |
| Europe | 111 | 64 | 58% | 41 | 37% |
| Latin Americ | 45 | 26 | 58% | 6 | 13% |
| Mideast | 36 | 29 | 81% | 3 | 8% |
| Canada | 8 | 5 | 63% | 7 | 88% |

Note: the sum of Stay and Return may not add up to Total. For example, candidates may be placed in a third continent other than their home continent or the U.S.

In addition, Canadian candidates who return to home continent may be placed in either Canada or the U.S.

Table 4. The Job Type of All Candidates

| Job Types | Academia | | Gov't | | Private | | Temp | | Total |
|---|---|---|---|---|---|---|---|---|---|
| *Overall* | *Count* | *Percent* | *Count* | *Percent* | *Count* | *Percent* | *Count* | *Percent* | |
| | 309 | 55% | 77 | 14% | 125 | 22% | 48 | 9% | 559 |
| *Gender* | | | | | | | | | |
| Female | 94 | 49% | 29 | 15% | 52 | 27% | 17 | 9% | 192 |
| Male | 215 | 59% | 48 | 13% | 73 | 20% | 31 | 8% | 367 |
| *Program Tier* | | | | | | | | | |
| Tier1 | 76 | 56% | 21 | 16% | 30 | 22% | 8 | 6% | 135 |
| Tier2 | 61 | 54% | 14 | 13% | 27 | 24% | 10 | 9% | 112 |
| Tier3 | 93 | 57% | 22 | 13% | 35 | 21% | 14 | 9% | 164 |
| Tier4 | 79 | 53% | 20 | 14% | 33 | 22% | 16 | 11% | 148 |
| *Continent* | | | | | | | | | |
| Africa | 2 | 29% | 2 | 29% | 2 | 29% | 1 | 14% | 7 |
| Asia | 97 | 52% | 20 | 11% | 54 | 29% | 15 | 8% | 186 |
| Australia | 4 | 50% | 3 | 38% | 0 | 0% | 1 | 13% | 8 |
| Europe | 66 | 61% | 12 | 11% | 19 | 18% | 11 | 10% | 108 |
| Latin America | 22 | 51% | 5 | 12% | 11 | 26% | 5 | 12% | 43 |
| Mideast | 19 | 54% | 6 | 17% | 4 | 11% | 6 | 17% | 35 |
| North America | 99 | 58% | 29 | 17% | 35 | 20% | 9 | 5% | 172 |

Table 5. Marginal Effects of Probit Analysis on Job Location
(Foreign Candidates Only)

| VARIABLES | (1) | (2) | (3) |
|---|---|---|---|
| Female | 0.063 | 0.051 | 0.065 |
| | (0.052) | (0.101) | (0.054) |
| China | 0.132* | 0.055 | 0.132* |
| | (0.074) | (0.109) | (0.074) |
| India | 0.150* | 0.251*** | 0.150* |
| | (0.083) | (0.095) | (0.083) |
| Korea | -0.227** | -0.214* | -0.227** |
| | (0.102) | (0.113) | (0.102) |
| Russia | -0.100 | -0.126 | -0.100 |
| | (0.118) | (0.124) | (0.119) |
| Turkey | 0.170 | 0.246*** | 0.170 |
| | (0.105) | (0.077) | (0.105) |
| Japan | -0.121 | -0.152 | -0.121 |
| | (0.144) | (0.167) | (0.144) |
| Italy | -0.217 | -0.431** | -0.217 |
| | (0.144) | (0.167) | (0.143) |
| Taiwan | -0.046 | -0.157 | -0.047 |
| | (0.155) | (0.220) | (0.156) |
| Argentina | 0.308*** | 0.306*** | 0.307*** |
| | (0.044) | (0.044) | (0.046) |
| Additional master degree | -0.101* | -0.101* | -0.101* |
| | (0.052) | (0.056) | (0.052) |
| Ph.D. tier 2 | -0.301*** | -0.304*** | -0.297*** |
| | (0.082) | (0.083) | (0.099) |
| Ph.D. tier 3 | -0.279*** | -0.276*** | -0.279*** |
| | (0.084) | (0.087) | (0.084) |
| Ph.D. tier 4 | -0.276*** | -0.277*** | -0.276*** |
| | (0.096) | (0.098) | (0.096) |
| Size | -0.007 | -0.007 | -0.007 |
| | (0.004) | (0.004) | (0.004) |
| Teaching awards | 0.006 | -0.004 | 0.006 |
| | (0.042) | (0.045) | (0.042) |
| top4j | -0.028 | -0.070 | -0.028 |
| | (0.183) | (0.174) | (0.183) |
| top5-50j | -0.149 | -0.121 | -0.149 |
| | (0.111) | (0.113) | (0.111) |
| top5-50rr | 0.161 | 0.131 | 0.162 |
| | (0.128) | (0.139) | (0.129) |
| Topadvisor | -0.299** | -0.293* | -0.299** |
| | (0.143) | (0.159) | (0.144) |
| Female*County Dummy | N | Y | N |
| Female*Program Tier | N | N | Y |
| Observations | 394 | 394 | 394 |
| Pseudo R-squared | 0.0998 | 0.113 | 0.0998 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6. Marginal Effects of Multinomial Logit Analysis on Job Type
(All Candidates)

| | (1) | (2) | (3) |
|---|---|---|---|
| Placement Type | Academic | Government | Private |
| Female | -0.076* | 0.020 | 0.054 |
| | (0.045) | (0.016) | (0.047) |
| U.S. | -0.019 | 0.004 | 0.026 |
| | (0.061) | (0.018) | (0.055) |
| China | -0.124* | -0.034** | 0.167** |
| | (0.065) | (0.016) | (0.069) |
| India | -0.027 | -0.040** | 0.070 |
| | (0.075) | (0.019) | (0.073) |
| Korea | -0.209** | 0.019 | 0.200** |
| | (0.100) | (0.034) | (0.096) |
| Russia | 0.033 | -0.100*** | 0.093 |
| | (0.091) | (0.011) | (0.091) |
| Turkey | 0.013 | 0.015 | -0.034 |
| | (0.109) | (0.045) | (0.113) |
| Japan | 0.152* | -0.034 | -0.117 |
| | (0.086) | (0.023) | (0.089) |
| Italy | -0.060 | 0.004 | 0.076 |
| | (0.147) | (0.054) | (0.140) |
| Taiwan | 0.182* | -0.077*** | -0.105 |
| | (0.094) | (0.008) | (0.095) |
| Argentina | -0.044 | -0.024 | 0.088 |
| | (0.178) | (0.039) | (0.170) |
| Additional master degree | 0.002 | 0.007 | -0.009 |
| | (0.040) | (0.015) | (0.035) |
| Ph.D. tier 2 | -0.024 | 0.003 | 0.020 |
| | (0.061) | (0.024) | (0.062) |
| Ph.D. tier 3 | 0.017 | 0.004 | -0.025 |
| | (0.049) | (0.013) | (0.049) |
| Ph.D. tier 4 | -0.048 | 0.018 | 0.028 |
| | (0.064) | (0.024) | (0.065) |
| Size | -0.005* | 0.002** | 0.004 |
| | (0.003) | (0.001) | (0.003) |
| Teaching awards | 0.009 | -0.007 | -0.003 |
| | (0.044) | (0.011) | (0.039) |
| top4j | 0.323*** | -0.068*** | -0.237*** |
| | (0.021) | (0.007) | (0.022) |
| top4rr | 0.075 | 0.156 | -0.215*** |
| | (0.311) | (0.307) | (0.020) |
| top5-50j | 0.165*** | -0.018 | -0.145*** |
| | (0.064) | (0.026) | (0.056) |
| top5-50rr | 0.037 | -0.039* | 0.026 |
| | (0.088) | (0.022) | (0.087) |
| topadvisor | 0.043 | -0.008 | -0.034 |
| | (0.069) | (0.036) | (0.080) |
| Observations | 559 | 559 | 559 |
| Pseudo R-squared | 0.0691 | 0.0691 | 0.0691 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 7. Marginal Effects of Probit Analysis on Job Location and Job Type
(Foreign Candidates Only)

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | All Foreign Candidates | | | Korean Candidates Excluded | | |
| Stayus | -0.027 | -0.034 | -0.075 | -0.134** | -0.122** | -0.070 |
| | (0.066) | (0.071) | (0.093) | (0.058) | (0.061) | (0.090) |
| Female | -0.092* | -0.083 | -0.062 | -0.098* | -0.084 | -0.073 |
| | (0.051) | (0.057) | (0.055) | (0.052) | (0.060) | (0.059) |
| China | | -0.104 | 0.073 | | -0.087 | 0.075 |
| | | (0.070) | (0.138) | | (0.070) | (0.135) |
| India | | 0.033 | 0.049 | | 0.033 | 0.046 |
| | | (0.089) | (0.185) | | (0.086) | (0.182) |
| Korea | | -0.206** | -0.545*** | | — | — |
| | | (0.099) | (0.090) | | | |
| Russia | | 0.063 | 0.123 | | 0.041 | 0.114 |
| | | (0.097) | (0.133) | | (0.101) | (0.132) |
| Turkey | | -0.038 | -0.203 | | -0.043 | -0.191 |
| | | (0.124) | (0.275) | | (0.123) | (0.281) |
| Japan | | 0.213* | 0.148 | | 0.194* | 0.142 |
| | | (0.109) | (0.198) | | (0.116) | (0.189) |
| Italy | | -0.113 | -0.124 | | -0.114 | -0.133 |
| | | (0.170) | (0.236) | | (0.168) | (0.232) |
| Taiwan | | 0.285** | 0.415*** | | 0.269** | 0.394*** |
| | | (0.112) | (0.027) | | (0.106) | (0.029) |
| Argentina | | -0.039 | 0.425*** | | -0.015 | 0.404*** |
| | | (0.202) | (0.027) | | (0.198) | (0.029) |
| China*Stayus | | | -0.243 | | | -0.236 |
| | | | (0.168) | | | (0.174) |
| India*Stayus | | | -0.037 | | | -0.033 |
| | | | (0.249) | | | (0.246) |
| Russia*Stayus | | | -0.152 | | | -0.154 |
| | | | (0.304) | | | (0.306) |
| Turkey*Stayus | | | 0.193 | | | 0.173 |
| | | | (0.197) | | | (0.196) |
| Korea*Stayus | | | 0.404*** | | | — |
| | | | (0.027) | | | |
| Japan*Stayus | | | 0.130 | | | 0.118 |
| | | | (0.292) | | | (0.285) |
| Italy*Stayus | | | 0.019 | | | 0.044 |
| | | | (0.237) | | | (0.218) |
| Taiwan*Stayus | | | -0.647*** | | | -0.673*** |
| | | | (0.025) | | | (0.025) |
| Argentina*Stayus | | | -0.678*** | | | -0.707*** |
| | | | (0.023) | | | (0.024) |
| Additional master degree | -0.017 | -0.046 | -0.029 | 0.023 | -0.003 | -0.005 |
| | (0.051) | (0.051) | (0.049) | (0.052) | (0.052) | (0.050) |
| Ph.D. tier 2 | 0.088 | 0.094 | 0.093 | 0.090 | 0.100 | 0.100 |
| | (0.080) | (0.078) | (0.085) | (0.083) | (0.083) | (0.083) |
| Ph.D. tier 3 | 0.103** | 0.114** | 0.143*** | 0.126** | 0.134** | 0.138*** |
| | (0.048) | (0.050) | (0.054) | (0.052) | (0.053) | (0.051) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ph.D. tier 4 | 0.073 | 0.082 | 0.124 | 0.105 | 0.117 | 0.131 |
| | (0.084) | (0.082) | (0.085) | (0.085) | (0.082) | (0.083) |
| Size | -0.001 | -0.001 | -0.001 | -0.000 | 0.001 | 0.001 |
| | (0.003) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Teaching awards | 0.029 | 0.026 | 0.021 | 0.039 | 0.042 | 0.038 |
| | (0.066) | (0.068) | (0.065) | (0.068) | (0.070) | (0.068) |
| top5-50j | 0.265** | 0.259** | 0.228** | 0.235** | 0.243** | 0.218** |
| | (0.105) | (0.105) | (0.105) | (0.106) | (0.100) | (0.098) |
| top5-50rr | 0.139 | 0.161 | 0.140 | 0.100 | 0.124 | 0.133 |
| | (0.135) | (0.126) | (0.126) | (0.140) | (0.129) | (0.124) |
| Topadvisor | 0.177 | 0.140 | 0.148 | 0.185 | 0.165 | 0.157 |
| | (0.123) | (0.125) | (0.128) | (0.119) | (0.115) | (0.118) |
| Observations | 350 | 350 | 350 | 314 | 314 | 314 |
| Pseudo R-squared | 0.0283 | 0.0592 | 0.122 | 0.0480 | 0.0661 | 0.0777 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8. Tobit Analysis on Job Rank (All Candidates)

| VARIABLES | (1)<br>Full Sample | (2)<br>Full Sample | (3)<br>Full Sample | (4)<br>Female Only | (5)<br>Male Only |
|---|---|---|---|---|---|
| Female | 8.704 | 29.502*** | 17.083 | | |
| | (28.298) | (6.542) | (33.185) | | |
| U.S. | 32.257 | 31.773*** | 32.590 | 57.261 | 21.022 |
| | (34.515) | (4.642) | (34.751) | (82.412) | (31.815) |
| China | 22.148 | 96.775*** | 22.764 | -10.041 | 82.291 |
| | (41.894) | (9.128) | (41.624) | (49.672) | (63.826) |
| India | -47.377 | -92.105*** | -47.601 | 12.014 | -96.185* |
| | (41.289) | (10.100) | (41.554) | (66.238) | (57.611) |
| Korea | 166.841*** | 188.096*** | 167.455*** | 135.180* | 178.083** |
| | (60.868) | (8.542) | (60.712) | (75.643) | (74.595) |
| Russia | 16.646 | 42.754*** | 15.203 | -55.416 | 30.407 |
| | (54.567) | (12.426) | (53.824) | (119.504) | (49.450) |
| Turkey | -69.737 | -155.086*** | -70.030 | 1,427.906 | -162.910*** |
| | (48.864) | (6.501) | (48.277) | (0.000) | (41.858) |
| Japan | -12.572 | 42.929*** | -14.570 | -439.821*** | 30.703 |
| | (68.464) | (5.851) | (69.237) | (61.065) | (60.676) |
| Italy | 127.638 | 1,379.374*** | 127.904 | 3.782 | 1,348.202 |
| | (105.681) | (46.814) | (107.391) | (128.384) | (0.000) |
| Taiwan | 29.150 | 2.458 | 25.265 | 79.190 | -9.458 |
| | (61.958) | (13.959) | (62.974) | (97.583) | (91.256) |
| Argentina | -46.654 | -41.137*** | -51.894 | | -49.672 |
| | (60.508) | (5.732) | (57.306) | | (60.266) |
| Female*Italy | | -1,366.203*** | | | |
| | | (46.814) | | | |
| Female*Taiwan | | 52.041*** | | | |
| | | (19.550) | | | |
| Female*Japan | | -488.283*** | | | |
| | | (16.362) | | | |
| Female*China | | -128.458*** | | | |
| | | (12.800) | | | |
| Female*India | | 80.043*** | | | |
| | | (12.292) | | | |

| | | | | | |
|---|---|---|---|---|---|
| Female*Korea | | -72.804*** | | | |
| | | (17.397) | | | |
| Female*Russia | | -77.030*** | | | |
| | | (16.483) | | | |
| Female*Turkey | | 1,481.327 | | | |
| | | (0.000) | | | |
| Additional master degree | 9.900 | 10.056* | 10.117 | 14.190 | 8.559 |
| | (26.401) | (5.875) | (26.223) | (52.630) | (29.846) |
| Ph.D. tier 2 | 40.794 | 39.747*** | 54.672 | -9.447 | 62.306* |
| | (27.714) | (3.918) | (33.736) | (43.091) | (34.843) |
| Ph.D. tier 3 | 75.729** | 65.588*** | 75.438** | 15.751 | 87.680* |
| | (32.889) | (5.715) | (32.750) | (50.665) | (46.929) |
| Ph.D. tier 4 | 250.914*** | 253.526*** | 250.431*** | 208.535*** | 269.271*** |
| | (42.007) | (4.589) | (41.877) | (65.236) | (55.830) |
| Size | 2.455 | 2.638*** | 2.435 | 0.540 | 3.441 |
| | (2.010) | (0.348) | (1.997) | (3.600) | (2.226) |
| Teaching awards | 3.765 | 5.800** | 3.356 | 22.357 | 5.065 |
| | (16.394) | (2.607) | (16.549) | (52.313) | (17.729) |
| top4j | -160.698*** | -133.473*** | -159.989*** | 71.660 | -194.401*** |
| | (32.006) | (7.817) | (31.384) | (155.175) | (26.263) |
| top4rr | 1,563.154 | 1,442.473 | 1,566.313 | 1,345.840 | 1,489.679 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| top5-50j | 34.417 | 26.836*** | 35.495 | 39.317 | 36.717 |
| | (47.903) | (5.259) | (48.400) | (120.671) | (50.958) |
| top5-50rr | -151.065*** | -132.030*** | -150.473*** | -60.773 | -145.740*** |
| | (48.772) | (6.079) | (49.235) | (122.268) | (51.746) |
| Topadvisor | -2.018 | -23.209*** | -2.194 | -62.631 | 9.253 |
| | (52.242) | (4.010) | (52.237) | (70.939) | (69.489) |
| Female*Program Tier Dummy | N | N | Y | N | N |
| Constant | 152.001*** | 142.442*** | 149.650*** | 219.857*** | 121.569** |
| | (48.601) | (6.826) | (49.993) | (73.417) | (54.851) |
| Observations | 511 | 511 | 511 | 175 | 336 |
| Pseudo R-squared | 0.0236 | 0.0304 | 0.0237 | 0.0272 | 0.0338 |

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

**Appendix Table A.1 List of Economics Programs in the Sample**

| Tier 1 | Tier 2 |
|---|---|
| Chicago | Columbia |
| Chicago (Bus) | Michigan |
| Harvard | NYU |
| Harvard (Bus) | NYU (Bus) |
| MIT | Northwestern |
| Princeton | Northwestern (Bus) |
| Stanford | Pennsylvania |
| Stanford Bus. | UC San Diego |
| UC Berkeley | UCLA |
| | Wisconsin |
| | Yale |

| Tier 3 | Tier 4 |
|---|---|
| Boston | Arizona |
| Brown | Arizona State |
| Cal IT | Boston College |
| Carnegie Mellon | Colorado |
| Cornell | Florida |
| Duke | Georgetown |
| John Hopkins | Illinois |
| Maryland | Indiana |
| Minnesota | Iowa |
| Ohio State | Michigan State |
| Penn State | Pittsburgh |
| Rochester | Purdue |
| Texas | Rice |
| UC Davis | Rutgers |
| Virginia | Texas A&M |
| | UC Irvine |
| | UC Santa Barbara |
| | UNC |
| | USC |
| | Vanderbilt |
| | WU- St Louis |
| | Washington |

Source: *US News* 2005 ranking

Appendix Table A.2. Distribution of Country Origin, Female, and Placement by Country/Region

| Nation | Country of Origin | Placement in the Country | Ratio (column C /column D) | Import (column C - column D) | Female | Female/Male Ratio | Stay in the U.S. | Stay Ratio (column I /column C) | Return to Country of Origin | Rturn Ratio (column K /column C) |
|---|---|---|---|---|---|---|---|---|---|---|
| Algeria | 1 | | | | | | 1 | 100% | | |
| Argentina | 11 | | | | | | 10 | 91% | | |
| Australia | 7 | 10 | 1.43 | 3 | 2 | 29% | 4 | 57% | 2 | 29% |
| Austria | 1 | | | | | | 1 | 100% | | |
| Bangladesh | 1 | | | | | | 1 | 100% | | |
| Belgium | 2 | | | | | | 2 | 100% | | |
| Bolivia | 1 | | | | | | 1 | 100% | | |
| Brazil | 9 | 3 | 0.33 | -6 | 4 | 44% | 4 | 44% | 3 | 33% |
| Bulgaria | 6 | | | | 3 | 50% | 2 | 33% | | |
| Canada | 8 | 13 | 1.63 | 5 | 3 | 38% | 5 | 63% | 2 | 25% |
| Chile | 4 | | | | 2 | 50% | 2 | 50% | | |
| China | 70 | 17 | 0.24 | -53 | 43 | 61% | 50 | 71% | 14 | 20% |
| Colombia | 4 | 2 | 0.50 | -2 | 2 | 50% | 1 | 25% | 2 | 50% |
| Copenhagen | | 1 | | | | | | | | |
| Denmark | | 1 | | | | | | | | |
| Ecuador | 1 | | | | | | | | | |
| Egypt | 1 | | | | | | | | | |
| Finnish | 1 | | | | | | | | | |
| France | 3 | 4 | 1.33 | 1 | 1 | 33% | 3 | 100% | | |
| German | 14 | | | | 1 | 7% | 9 | 64% | | |
| Germany | | 5 | | | | | | | | |
| Ghana | 3 | 1 | 0.33 | -2 | 1 | 33% | 2 | 67% | 1 | 33% |
| Greece | 7 | | | | 1 | 14% | 5 | 71% | | |
| Guinea | 1 | | | | | | | | | |
| Hungary | 2 | | | | 1 | 50% | 1 | 50% | | |
| India | 42 | 2 | 0.05 | -40 | 22 | 52% | 31 | 74% | 2 | 5% |
| Iran | 6 | | | | 1 | 17% | 5 | 83% | | |
| Ireland | 4 | | | | | | 4 | 100% | | |
| Israel | 9 | 1 | 0.11 | -8 | | | 8 | 89% | 1 | 11% |
| Italy | 11 | 9 | 0.82 | -2 | 6 | 55% | 5 | 45% | 4 | 36% |
| Japan | 16 | 4 | 0.25 | -12 | 2 | 13% | 7 | 44% | 4 | 25% |
| Korea | 39 | 20 | 0.51 | -19 | 12 | 31% | 15 | 38% | 18 | 46% |
| Kyrgyzstan | 1 | | | | 1 | 100% | 1 | 100% | | |
| Latvia | 1 | | | | | | 1 | 100% | | |
| Lebanon | 1 | | | | | | 1 | 100% | | |
| Luxembourg | | 1 | | | | | | | | |
| Malaysia | 2 | | | | 2 | 100% | 1 | 50% | | |
| Mexico | 10 | 6 | 0.60 | -4 | | | 7 | 70% | 1 | 10% |
| Mongolia | 1 | 1 | 1.00 | 0 | | | | | 1 | 100% |
| Nepal | 1 | | | | | | | | | |
| Netherlands | 1 | 1 | 1.00 | 0 | | | 1 | 100% | | |
| New Zealand | 1 | | | | | | 1 | 100% | | |
| New Zeland | | 1 | | | | | | | | |
| Norway | | 2 | | | | | | | | |
| Pakistan | 2 | | | | 1 | 50% | 2 | 100% | | |
| Peru | 3 | | | | | | 1 | 33% | | |
| Philippines | | 2 | | | | | | | | |
| Poland | 6 | | | | | | 4 | 67% | | |
| Portugal | 4 | 1 | 0.25 | -3 | 1 | 25% | 2 | 50% | | |
| Romania | 6 | | | | 3 | 50% | 4 | 67% | | |
| Russia | 23 | 7 | 0.30 | -16 | 7 | 30% | 10 | 43% | 7 | 30% |
| Singapore | 1 | 5 | 5.00 | 4 | 1 | 100% | 1 | 100% | | |
| Slovenia | 1 | | | | | | | | | |
| South Africa | 1 | | | | 1 | 100% | | | | |
| Spain | 10 | 17 | 1.70 | 7 | 1 | 10% | 5 | 50% | 5 | 50% |
| Sweden | | 1 | | | | | | | | |
| Switzerland | 1 | 1 | 1.00 | 0 | | | | | | |
| Taiwan | 13 | 3 | 0.23 | -10 | 8 | 62% | 6 | 46% | 2 | 15% |
| Thailand | 3 | 1 | 0.33 | -2 | 1 | 33% | 1 | 33% | 1 | 33% |
| Turkey | 18 | 2 | 0.11 | -16 | 6 | 33% | 13 | 72% | 2 | 11% |
| U.K. | 1 | 13 | 13.00 | 12 | | | | | 1 | 100% |
| U.S. | 169 | 400 | 2.37 | 231 | 53 | 31% | 155 | 92% | 153 | 91% |
| Ukraine | 5 | | | | 2 | 40% | 4 | 80% | | |
| United Arab Emurates | | 1 | | | | | | | | |
| Uruguay | 1 | | | | 1 | 100% | | | | |
| Venezuela | 2 | | | | 1 | 0.5 | 1 | 50% | | |
| Vietnam | 4 | | | | 2 | 50% | 3 | 75% | | |