Migration of Talent:
Foreign Students
and Graduate Economics in the US

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Working Paper No. 84

February 1993

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I would like to thank David Colander, Ron Ehrenberg, Duncan Foley, Hirschel Kasper, Dimitri Papadimitriou and especially Andre Burgstaller for helpful discussions and comments.

I would like to acknowledge the financial support of the Jerome Levy Economics Institute's Resident Scholar Fellowship Program in the development in this research.

I. Introduction

Were Joseph Schumpeter to walk into a graduate economics theory class at Harvard today, he would be struck by two dramatic differences with when he last taught the class in the 1950s. First, the subject matter: The emphasis on mathematical techniques. Second, the composition of the students in the class: Nearly half of the students in the class are foreign students.

The most recent examination of U.S. graduate economics education by the Committee on Graduate Education in Economics (COGEE) studies the first issue - the emphasis on mathematical technique and the resulting change in course content- in considerable depth (Krueger (1991) and Hansen (1991)).

Not so with the second issue. This issue can be approached in two ways. First, examining the decline in American students' demand for graduate study in economics. Second, studying the increase in foreign students' demand (and supply) for U.S. graduate economics education. The COGEE report concentrates on the former (Kasper, et. al. (1991)); but wholly neglects the latter.

It is the purpose of this paper to address this shortcoming in the COGEE reports: I shall study the reasons for the presence and increase in the supply of foreign students in graduate economics programs in the U.S. The questions posed and addressed are as follows. Why are there so many foreigners in U.S. economics Ph.D programs? What is the reason for the change in the proportion of foreign students over time? What effect has this had on American graduate (and undergraduate) economics education?

The standard explanation for the presence of foreign students in American economics Ph.D programs goes as follows. The U.S. is said to hold a comparative advantage in graduate economics education. Thus, students from all over the world come to the U.S. for the relatively higher quality education; and return home after securing Ph.Ds.

This explanation does not stand up to closer scrutiny. The foreign student population is not representative of the educated population of the world: Most of foreign students are from a few Asian countries: India, South Korea, Peoples Republic of China (PRC) and Taiwan; very few are from either other low income countries or

from the other countries of the industrialised world (Germany, Britain, and Japan). Further, many of the foreign born Ph.Ds remain in this country. Finally, this explanation fails to account for the dramatic increase in the numbers (and proportions) of foreign born Ph.Ds in economics in the post World War II era.

This paper offers an alternative explanation: The economics Ph.D program is viewed by Asians as the optimal route to migrate to the U.S. Section 2 sets forth the static argument. I argue that there are strong economic incentives for Asians to wish to migrate to the U.S. However, American immigration regulations severely restrict the movement of unskilled or skilled labor into this country; getting work permission with even an American professional degree (an MBA or law degree) is difficult. However, it is quite easy to secure work permission as a university faculty member, for which, however, an American Ph.D is essential. The only way, therefore, for foreigners to legally migrate to the U.S. is to obtain a Ph.D and to subsequently secure an academic job. In addition, the declining numbers of top American students applying to graduate economics programs made U.S. universities particularly receptive to high quality foreigners.

Section 3 addresses the following question: What caused the substantial increase in foreign, especially Asian, students since the 1950s? I argue that the reasons lie in the simultaneous growth both in the demand for, and the supply of Asian students. The prestige of Asian institutions within the country was (and is) a function of the fraction of its graduates admitted into American Ph.D programs; at the same time American institutions assess the quality of the Asian institutions on the basis of its graduates' perfomance in the States. Outstanding perfomance by the few Asian students admitted in the 1950s sent positive signals to American universities about the quality of those Asian institutions in screening and training top talent at the undergraduate level; more students from those Asian institutions were admitted in the following years. This, in turn, raised the prestige of those Asian baccalaureate institutions, which intensified the competition for entry into those institutions, helping those institutions to even better sort out the talent.

Section 4 demonstrates that the 'foreign student phenomenon' could provide the solution to the 'time-to-degree' question. The final section contains some policy issues.

In the discussion to follow, I shall lump the top four source countries (PRC, Taiwan, India and South Korea) together and refer to them as the South: For the purposes of the argument in this paper the similarities far outweigh the differences between the countries.

II. The Static Story

A. Autarchy

Begin by assuming that individuals differ in the amount of talent (alternatively intelligence/productivity) they possess: there is a distribution of talent, given at birth and unchangeable, amongst the individuals in the country.

Education serves both to sort/screen the talent and to impart human capital. To simplify the argument, suppose that undergraduate education serves primarily as a screen, through exams and course grades; and that post BA education - professional degrees and Ph.D - imparts 'job-specific' human capital. Professional schools (such as business and law) prepare their students for jobs in banking, law, consulting and so on, while Ph.D programs prepare their graduates to teach undergraduates, professional school students, and Ph.D students. So, these two post BA degrees are distinct and not interchangeable, i.e., a professional degree is a necessary condition to be a banker, and a Ph.D to be a professor. Both programs require a BA as a prerequisite. Assume, further, that the number of places in either of the post BA programs is limited: they can accomodate only a small section of the population. Admission into either program is strictly on merit: the best students among the applicants, as determined by perfomance in the BA program, are admitted.

Assume that individuals choose occupations to maximize their economic returns. Consider, now, the economic returns to the various occupations. The average starting salary for an MBA from a 'top 10' business school is about $60,000 (that for the JD is similar); the average starting salary for a Ph.D from a top economics program as an assistant professor of economics is about $38,000. Furthermore, the rate of increase in income over career span is higher for the MBA than for the Ph.D.

The best talent in the country thus opts for professional degrees; and the second tier talent, i.e., those who fail to get into professional schools, opts for the Ph.D.

B. The South and The Migration of Talent

Consider now a different country, the South. It has the identical distribution of talent, the same basic educational structure, and the same relative returns to the different educational degrees as the U.S. The key difference with the U.S. is as follows: In the South, the level of the return to any degree is lower than that for any degree in the U.S.

As is well known, the striking disparity in per-capita income levels between the South and the U.S. provides considerable economic incentives for Southerners to migrate to the States.

There are, however, two significant barriers to migration. First, to legally immigrate to the United States, one must be 'sponsored' by either a U.S. citizen family member or an American employer. For those without a family in the U.S. the only route to citizenship is the latter- employment based: the U.S. Department of Labor must, on the basis of an American employer's sponsorship, certify that "no American can do or is available for this job". Clearly, the probability of obtaining the alien employment certification is excellent where an employer has difficulty locating a qualified U.S. worker for the position. U.S. Department of Labor regulations provide, in addition, for special handling of labor certification applications for college or university teachers and aliens of exceptional ability in the performing arts: an employer can select the best qualified candidate, regardless of citizenship, for the position (see IN Act 1986 and IN Act 1990).

Second, even assuming that hiring is strictly merit based (i.e., that employers are indifferent to national origin), U.S. employers only consider hiring individuals with the appropriate American degree (since they lack information about the 'quality' of Southern educational institutions and, therefore, of Southern degrees).

However, U.S. graduate academic institutions do consider the educational institutions of some Southern countries as equivalent to their American counterparts. This assessment is obviously limited to

countries which have a strong basic educational system and who have invested in developing strong undergraduate institutions.

Combine the economic incentives to migrate with these two barriers to entry, and the resulting flow of migration from the South is obvious. Top Southern talent, sorted out by Southern undergraduate educational institutions, would wish to get a U.S. Ph.D, and subsequently become professors in the U.S. Since Southern undergraduate institutions are considered equivalent to American ones in screening talent, and since admission into post BA programs (in both countries) is purely on merit, it follows that U.S. Ph.D programs would prefer top Southern talent to the second tier American talent which would also be competing for admission into these programs.

Thus, in the U.S. the graduate programs always get the top talent: American professional programs attract the best U.S. talent and American Ph.D programs attract the best Southern talent. [Not so in the South: it is those who fail to get into U.S. Ph.D programs who opt for Southern professional degrees; and the ones who *failed to get into either* get Southern Ph.Ds[1]!]

The flow of talent sketched above is exacerbated by admitting the existence of high tuition fees, and the strikingly different financial aid policies of U.S. graduate schools. Educational institutions in both countries charge tuition fees for the degrees they offer. These fees are affordable to the residents of the countries: Even if the residents could not actually afford education, they have access to loans or other third party aid (from either the school, the government, or banks). The countries differ from each other in the level of the fees charged: U.S. tuition fees are several times the average annual income of a Southerner. Southerners do not have ready access to loans in the U.S[2].

In the U.S., Ph.D programs offer generous financial aid: In most programs anyone who is admitted is given financial aid. Not so for other American degrees, especially most professional programs in the U.S.: in most professional schools only a small fraction (1-2%) of the entering class is offered scholarships. Thus, Southerners face a liquidity constraint: they simply could not afford to attend any program in the U.S. but the Ph.D.

Note the importance of the various assumptions, and the strong predictions of the theory sketched above. Obviously those with the strongest economic incentives to migrate to the U.S. would be from low income countries. The requirement of an American degree by U.S. employers, combined with American schools' merit-based admissions policies, further limits potential migrants to those coming from countries with a strong basic educational system. Combine these barriers with the relative returns to the various degrees in the U.S., and to U.S. immigration regulations, and it is clear that one would expect high quality talent from low income countries with a good educational structure to dominate U.S. Ph.D programs. As noted earlier, this is precisely the case.

III. Dynamics Over Time

In the period, immediately after World War II and up through the 1960s, graduate programs in the States had few foreign students. What explains the dramatic difference between the proportions of foreign students in graduate programs then and now? The answer lies in the dynamic process: In the simultaneous growth in both the demand for, and the supply of foreign students.

A. The Demand for Foreign Students by US Universities

For many obvious reasons universities wish to recruit the best talent available into their Ph.D programs. It is, therefore, reasonable to assume that U.S. universities would not 'discriminate' against Southern students per se: a 'high quality' Southern student is just as likely to be admitted into a Ph.D program as is an equally qualified American student.

In the immediate post war period, however, U.S. universities were unable to gauge a Southern student's quality simply because they lacked information about the effectiveness of Southern educational institutions in screening and training talent. For instance, while it is clear that any U.S. admission committee would have recognized the 'quality' of a valedictorian from Harvard; it is equally clear that few, in the 1960s, would have recognized the 'quality' of a valedictorian from Seoul National University in South Korea (an equivalent qualification).

A reasonable method of gauging the credibility of Southern institutions as a screen (and, therefore, of determining the quality of Southern talent) is by initially admitting a few students from the South, and monitoring their subsequent perfomance both in the Ph.D. program and after graduation.

In the 1950s American economics Ph.D programs admitted a few students with undergraduate degrees from Southern institutions, who proved to be exceptional[3]. In the next period (a period might be 4-5 years to allow for sufficient time to assess the students' perfomance), then, U.S. universities admitted a few more Southern students: As long as Southern students did better (on average) than their American classmates, more Southerners would be admitted in the subsequent period. Thus, the number of Southern students entering U.S. Ph.D programs in the 60s was higher than in the decade before, in the 70s even higher than in the 60s, and so on.

B. The Supply of Foreign Students by the South

Over the same period Southern baccalaureate institutions were screening and training top talent.

In the post war era the Southern countries secured independence: India in 1947, Taiwan and China in 1949, and South Korea in 1946. All of these countries emphasised education and began devoting more resources to the establishment of good educational institutions (or the strengthening of existing ones).

Southern high school students' choice of baccalaureate institution depends on the economic returns from graduating from that institution. Since the returns from working in the U.S. as a professor are so much higher than that for any occupation in the South, baccalaureate schools which sent even a small percentage of their graduates to the US became prestigious in the South. This intensified competition to enter these schools; the schools began attracting an even higher fraction of the best talent. This, of course, improved the accuracy of the screen and served even better to funnel talent to the U.S., which in turn resulted in even more students from those schools being admitted into American graduate programs. This, of course, increased the 'prestige' of the schools even more; resulting thereby in even fiercer competition for entry; serving, therefore, to screen the talent even better...

As mentioned earlier, Southern students in US graduate programs tend to be from fourAsian countries - Taiwan, China, India and South Korea. Each of these countries has numerous colleges/universities offering undergraduate economics programs and degrees. Yet, most of the Southern students in American Ph.D programs have been graduates of a very small group of elite undergraduate schools in their home countries - precisely the institutions regarded as the most 'prestigious' in economics in their respective countries. The competition for entry at those baccalaureate institutions, always high, has increased dramatically since the 1950s.

IV. Time - To - Degree

Krueger et. al (1991) and Hansen (1991) point out an interesting 'statistic': economics graduate students take longer to secure a Ph.D now than they did in the past. The amount of time taken for course-work has remained the same, two years. Thus, Krueger and Hansen correctly conclude that the increase in time has been at the dissertation writing phase. The papers comment on the disquieting aspect of this statistic, but are at a loss for an explanation.

The 'foreign student phenomenon' provides an explanation which is in two parts: first, the different motivations of graduate students (whether American or foreign); and second, the different opportunity costs of American as compared to foreign students.

It is well known that graduate students, even those in the same program, vary in their motivation and creativity[4]. Obviously those with a good deal of both are the most likely to complete their dissertations quickly. It is likely, further, that motivation levels do not vary by citizenship, i.e. that an American student is just as likely to be highly motivated as his/her foreign classmate.

However, the opportunity cost of pursuing a Ph.D does vary by citizenship: Americans have a higher opportunity cost than their Southern classmates. U.S. students in a Ph.D program always have (and have had) an alternative: a good full-time job[5]. Foreign students, on the other hand, do not have this alternative. Immigration restrictions do not permit them to get a full time job prior to completing their Ph.Ds. Foreign students may legally reside in the US iff: a) they are full time students or b) they are hired as

university faculty (for which they would need a Ph.D). Furthermore, the economic returns for even the best jobs in the South are much lower than that for almost any job in the States.

Combine the two and the 'answer' to the 'lengthier-time-to completion' puzzle is apparent. In the era when Americans comprised the majority of the Ph.D. entering class-the 40s and 50s and 60s- there was a natural selection[6]: those students who felt they could not complete their dissertations, dropped out (i.e. got jobs); the ones who remained were highly motivated, thereby completing their dissertations quickly.

Consider, now, the post 1975 era, when foreigners begin to comprise a substantial proportion of the entering class. Since, their opportunity costs are substantially lower (they cannot drop out and legally secure a full time job in the U.S.), many of the relatively less motivated foreign students who would otherwise have dropped out (as their like-motivated American classmates do) continue in the Ph.D program. Naturally, then, the time of completion for these students is longer; which, if the number of such students is significant, would undoubtedly have a noticeable effect on calculating the average time to completion of the Ph.D economics degree.

Immigration restrictions provide yet another reason for foreign students to remain in the Ph.D program longer than necessary. Visa regulations require students to leave the country upon completion of the Ph.D degree unless they have a job. Thus, foreign students who do not have a job offer will delay defending their thesis, in order to remain in the U.S. until they do get such an offer.

V. Conclusions

The 'foreign student phenomenon' gives rise to several issues.

Consider, first, the distinct contributions of the foreign born Ph.Ds in the United States. Due to the relative ease of securing a 'green card' in academia, foreign born Ph.D.s are more likely to pursue careers in academia than U.S. born Ph.Ds who have other options. Thus, in recent years a substantial fraction of the addition to the U.S. human capital stock are the foreign born Ph.D.s.

Second, the design of undergraduate curricula. View the undergraduate colleges as responsive to the demands of its students and it is clear that American and Southern undergraduate curricula must differ significantly.

Since the most popular postgraduate path for American liberal arts college economics majors is business or law school, the optimal strategy for these colleges is to offer a curriculum that does, indeed, cater to this demand: To offer an economics program that provides appropriate preparation for an MBA or JD. This means a program which gives students a general (rather than highly specialised) economics grounding, drawing out 'real world applications' in courses, and requiring seminars in which oral presentations and written papers are important. A solid grounding in mathematics is just not necessary.

However, for baccalaureate institutions in the South, the most popular postgraduate path is a US Ph.D. These institutions may, therefore, be developing an undergraduate curriculum which focuses more on appropriate preparation for a US Ph.D program (such as: i) strong preparation in mathematics, ii) offering final year courses that are at the level of a first year Ph.D course). Note that if this is, indeed, the case then Southern students entering U.S. Ph.D programs in economics would be even better prepared than their U.S. born counterparts.

Finally, there are some tricky issues of foreign aid that need to be identified and sorted out. U.S. universities, in particular many Ph.D programs, receive considerable funding from the US government, and, thus, ultimately from US taxpayers. Thus, giving financial aid to foreign students in a Ph.D program could be viewed as a form of foreign aid. In fact, a recent bill (H.R. 4595) in Congress views financial aid to foreign graduate students as just that- foreign aid- and wishes to stop funding of foreign students.

However, since most of the foreign students who receive the financial aid remain in the States, becoming part of the vital stock of human capital in the United States, then the financial aid awarded them should, therefore, be regarded as an investment in an asset.

On the other hand, the foreigners' undergraduate education in their home countries is heavily subsidised by their home governments. If these students were to return after their graduate

education in the U.S. this subsidy could be regarded as investment in human capital. However, as pointed out earlier, most migrate to the U.S. Since the home governments are not compensated for their educational subsidies, there is, therefore, reverse foreign aid taking place.

Footnotes

1. There are, of course, many distinguished Southern-born economists (see fn.3 for some examples). Note, however, that while most received their undergraduate degrees from their home countries; most, if not all, received graduate degrees from American or English universities. Furthermore, very few of these distinguished economists reside or work in the South.

2. Banks do not wish to lend to foreigners because the probability of getting their money back is lower: foreigners' job prospects are uncertain due to the immigration restrictions mentioned earlier.

3. These students included Carlos Diaz Alejandro, Jagdish Bhagwati, Guillermo Calvo, Meghnad Desai, Ronald Findlay, T.N. Srinivasan, V.K. Ramaswami, Amartya Sen, Miguel Sidrauski, Hirofumi Uzawa, Henry Wan.

4. As is well known, grades and test scores- standard criteria for admission - do not accurately measure creativity/motivation, i.e., the ability to do original research.

5. These jobs include working for the private sector (e.g.: research departments of banks), international organizations like the World Bank and IMF, the U.S. government, and not-for-profit institutions.

6. Note that this period also coincided with a 'boom' economy: jobs were readily available. It is likely that the less motivated American students would have remained in the program if they could not get good jobs.

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