

## Employment and Career Pattern of U.S.-trained Ph.D.'s in Korea

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The United States has been attracting foreign students for decades. The number of foreign students enrolled in the U.S. higher education institution has been increasing steadily for the last five decades (see Figure 1). The apparent trend of internationalization of higher education encourage more students seek studying abroad, and the U.S. because of its quality, size and diversity of higher education system has been attracting more and more foreign students. Although the 9-11 attack and the consequent tightening immigration procedures tarnished the attractiveness of U.S. somewhat, U.S. is still the largest destination of foreign students.

According to the data provided by the U.S. Institute of International Education (IIE), there were 564,766 students enrolled in higher education institutions in the U.S. in the 2005-06 academic year (IIE 2006). There are 58,847 Korean students in the same year, representing 10.5% of all foreign students. Korea ranks the third among the countries with most students in the U.S. following India with 76,503 students and China with 62,582 students. Considering the fact that both China and India have much bigger population sizes, Korea sends the most students (in relative terms) to the U.S. in the world. Among them, 46% are registered in undergraduate programs, 41% are registered in graduate programs, and the rests are in non-degree programs. In addition to the students enrolled in the regular programs, there are about 10,000 Korean students studying in intensive English programs in the U.S. Currently, Korea sends the largest number of students to the U.S. to the intensive English language training in the world, followed by Japan. In addition to the students, there are about

80,000 Korean visiting scholars in American Universities.

In addition to students, there are substantial number of scholars working in colleges, universities, and research institutions in the U.S. 2004 KAUPA (Korean American University Professors Association) Directory lists about 1,500 faculty members working in North America, and the majority of them are in the U.S. As the number of Korean (including second, third, and fourth generation Korean Americans) are rising rapidly recently, and substantial number is expected to be missing, one would guess the current figure would be about much higher. Many of these scholars have their Ph.D.'s (and other final academic degrees) in the U.S. Higher education has been used as a stepping stone for international migration. Many of such migration may not have been planned. That is to say, many such students may not explicitly plan to settle in the U.S. after their advanced degrees. However, the fact that the U.S. law favors highly educated and highly skilled workers as potential migrants and that the demand for professional jobs is high in the U.S., make the transition from graduate students to immigrants relatively easy.

Studying in the United States has a long tradition for Koreans. During the period of early modernization in the late nineteenth century, Koreans started to go abroad for the purpose of studying advanced subjects that were not available in Korea. Since then, it can be conceptually divided into five sub-periods: 1890-1910 (Chosun Dynasty period), 1910-1945 (Japanese colonialism), 1945-1960 (American influence), 1960-1990 (brain drain and brain gain), and the period after 1990 (mass internationalization).

During the period between 1890 and 1910 when Chosun Dynasty tried to cope with the encroachment of the powerful nations of the period, particularly Japan, the flow to the U.S. was minimal because of the obvious difficulty to travel long distance between the nations. Most foreign cultural and intellectual influence was through the students studied either in Japan and China. Only a handful of Koreans went to the U.S., and most of them did because of the personal safety (e.g., some tried revolt against the Japanese) in Korea. When Japan annexed Korea in 1910, there were few dozens of Koreans in the U.S. at a given time until 1940s. The number is far smaller than the number of students studying in Japan. However, their philosophy and the attitude toward Japanese colonialism, Korean nationalism, and pre-nation building were very different from those in Japan. The victory of the U.S. over Japan in the Pacific War gave the Korean scholars and leaders who were trained in the U.S. (including the first President Rhee Syngman who was educated in the U.S. including the Ph.D. from Princeton) a great deal of leverage, and they often served as the conduit of the American policy toward the occupied land. During the period of 1945 and 1960, the

number of Korean students increased very rapidly because of the American Occupation (1945–1948) and the Korean War (1950–1953). Most of the students who went to the U.S. during this period were either the children of wealthy Koreans who seek advanced education or orphans who were sponsored by American missionaries or soldiers. The majority of them were for undergraduate degrees. Later in Rhee’s administration, the government sponsored study abroad programs with the support U.S. government (including the East–West Center) and non–government charitable agencies such as Ford Foundation. However, a majority of those talents ended up staying in the U.S. for their career, as the pay and the working conditions between the U.S. and Korea were very substantial. Although the absolute number of Korean students was small, the share of Korean students among all foreign students in the U.S. was relatively high in the 1950s (see Figure 2).

Since 1960, a new dimension of the American influence started. Up until then, the U.S. influence was mainly through political and diplomatic channel. When the Park Administration (1961–89) set the goal of economic development as the primary national goal, it made a strategic choice of recruiting the U.S. trained engineers and economists in order to jump start the nation’s technology and implement economic development plans. As the number of such talents was small and the difference between the pay and working conditions between Korea and the U.S. was very large, the government, universities, and private firms paid very high salary (relative to the local average) in order to attract them. Such positive market signal for the U.S. educated professionals and rising income in Korea created a bonanza of going to the U.S. for the purpose of studying. Starting 1980, the number of Korean students started to increase very rapidly, and the majority of those students were graduate students pursuing Ph.D. degrees (see Figure 2 and Figure 5).

The model of brain drain/brain gain works like the following. With enough market signal and economic feasibility, many bright young people leave Korea to study in the U.S. Many of them end up staying in the U.S. because of its superior working condition and quality of life (brain drain). If Korea provided high enough incentives, some of these talents decided to come back to Korea (brain gain). The high incentives of the returnee created strong incentives for more young people to go to the U.S. As long as the incentive existed, the process of brain drain/brain gain continues. The proportion of U.S.–trained Ph.D. returning to Korea after the completion jumped from about one third in the 1960s and 1970s to two thirds in the 1980s and early 1990s. However, the process was not sustainable or stable (Kim 2004). As more talents were produced, and the demand for such talents did not grow as fast, the labor market outcome deteriorates.

At the same time, the number of Ph.D. generated in Korea started to increase steadily. In the early 1980s, the number of Ph.D.s awarded at Korean universities was less than 300, which was smaller than the number of Ph.D.s awarded in the U.S. However, the Ph.D.s awarded in Korea continuously increase, while Ph.D.s awarded in the U.S. stabilized around 1,500 since 1990 (see Figure 6)

The cumulative process of brain drain/brain gain changed dramatically as Korea's economy became more advanced and the labor market for the highly skilled workers became more globalized. Since the early 1990s, the number of students going outside of Korea has been increasing steadily, while the U.S. remained the major destination. The relative importance of undergraduate education over graduate increased. More workers and students go the U.S. for intensive language training, and more Korean scholars visited U.S. universities (Figure 3 and Figure 4). Younger students (including primary and secondary students) are moving to the U.S. in a larger scale. At the same time, the norm of lifetime employment and the length-of-tenure-based pay system has been seriously challenged after the 1997-98 financial crisis. Since the crisis, many firms started to restructure and changed to merit-based pay scale. The tightening labor market for Ph.D.'s in Korea and more demanding job performance by their employers made more new Ph.D.s seek their employment (at least in their early career) in the U.S. Consequently, the proportion of new Ph.D.s who intend to stay in the U.S. has been increasing since 1997. While the trend is similar, the proportion is typically higher for science and engineering Ph.D.s than other disciplines (see Figure 7).

All these changes happened during a relatively short time period. There are still some people who came back to Korea in the late 1970s active in the labor market. Korean employers typically have mandatory retirement, and the age of retirement varies from employer to employer. Typically, the mandatory retirement age for private firms is between 53 to 58, 60 for government-sponsored research institutes, and 65 for universities. The risk of losing jobs and early retirement made many Ph.D.s strongly favor universities over other employment, and government-sponsored research institutes over private sector. According to Lee et al. (2007), out of 372 job transfers who moved out of industry during the period between 1994 and 2006, 47% moved to higher education institutions and 8.3% to research institutions, and the remainder to other private firms. Among 400 transfers out of higher education institutions, 81% moved to other higher education institutions, 12% to research institutes, and only 7% to private firms. Among 233 transfers out of research institutes, 73% moved to higher education institutions, 16.7% to research institutions, and only 9.4% to private firms. According to the same survey, Ph.D.s working in the field of Science and Engineering,

68.3% of those workers received their degrees outside of Korea. Among the foreign Ph.D.s, 64% are from the United States. The same Survey also includes question to the 1,661 establishments including firms, government-sponsored research institutes, and universities.

Among the Koreans who received their Ph.D.s abroad, the U.S. is the biggest contributor. According to the data provided by the Korean Research Foundation, 52.8% of the foreign Ph.D.s who registered their degree during the period of 2000 and August, 2007 at the KRF received their degrees in the U.S. Following the U.S., the proportion of Japanese Ph.D.'s accounts for 17.7%, followed by Germany (7.1%), U.K. (5.5%), and China (4.6%). (Dong-A Daily, October 24, 2007) Since the data is based on self-reporting, and ignores the fact that the tendency of many U.S. Ph.D. don't return to Korea immediately after their degree, the U.S. proportion is likely to be higher.

Currently, U.S. Ph.D.'s dominate the professorial positions in Korean universities. The pattern is more striking in top rank universities. In Seoul National University, 886 out of 1,683 professors with Ph.D.s (52.6%) received their Ph.D.'s in the U.S. Some disciplines have much higher proportions than others. In general, humanities, law, medicine, and nursing have lower proportions of U.S. Ph.D.s than management, social sciences, natural sciences, and engineering. Almost 90% of business school faculty members have U.S. Ph.D.s. In social sciences, the proportion is 78.8%, in natural sciences, 77.6%, in engineering 76.8%, and in biological and life sciences, 76.8%. (Chosun Daily, October 18, 2007) The other two premier science and engineering universities in Korea, Korea Advanced Institute of Science and Technology (KAIST) and Pohang School of Technology (POSTECH) also have very high proportion of U.S. Ph.D.'s. In KAIST, 84 out of 101 science professors and 170 out of 239 engineering professors received their Ph.D.s in the U.S. In POSTECH, 73 out of 81 science professors and 99 out of 120 engineering professors received their Ph.D.s in the U.S. (KCUE, 2004)

In the second-tier universities, the proportion of U.S.-trained Ph.D.s is smaller. In Hanyang University, a private university, whose overall ranking in Korea is around 5 or 6, 23 out of 56 professors in sciences and 114 out of 283 engineering are U.S. Ph.D.s. At Kyunghee University, another private university, whose overall ranking is around 10, 23 out of 53 in science and 60 out of 90 engineering professors are from the U.S. At Kyungbook University, a national university in Daegu (a major provincial city), 53 out of 103 science and 46 out of 165 engineering professors received their Ph.D.s from major U.S. universities.

Recently, there has been increasing interest in the labor market situations of the

highly skilled workers, particularly science and engineering Ph.D.s. Several organizations such as Korea Research Foundation, Ministry of Science and Technology, and Korea Council of University Education maintain database of those people. Also, Who's Who database in major media corporation contain basic demographic information about those people. However, these data are usually incomplete, inaccurate, and often outdated. Moreover, the owners of the database are reluctant to release the data to researchers because of the privacy concern. New attempts have been made to collect more systematic information regarding their education, job characteristics, and labor market outcomes by using sample study (e.g., KRIVET and MOST). While these data are not comprehensive and ad hoc, these data can be analyzed for limited research purpose.

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Figure 1

Total Number of Foreign Student in the U.S. Higher Education

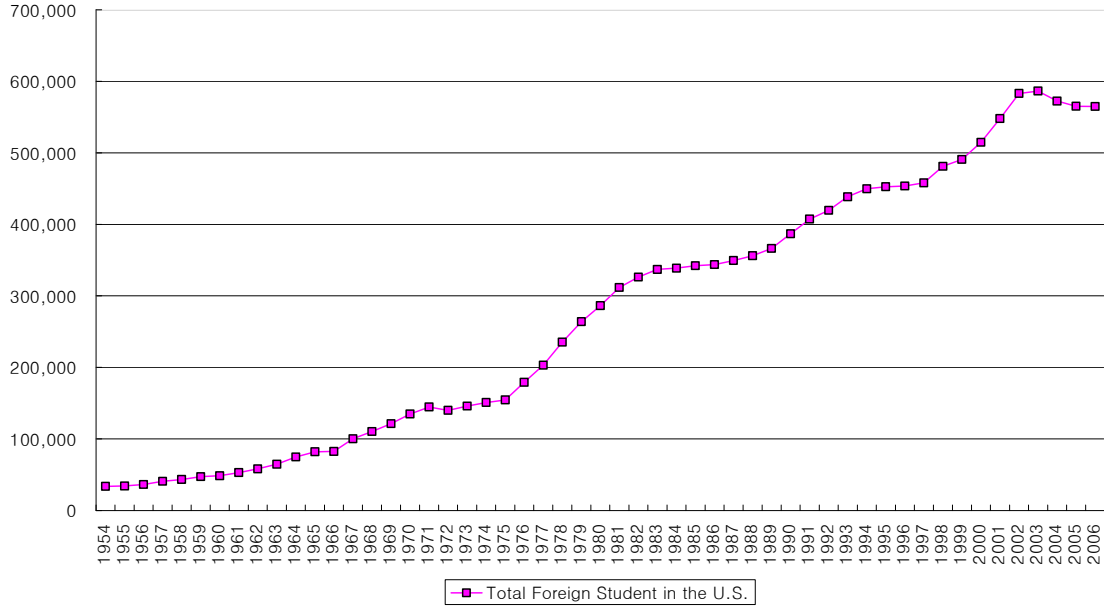


Figure 2

Korean Students in U.S. Higher Education

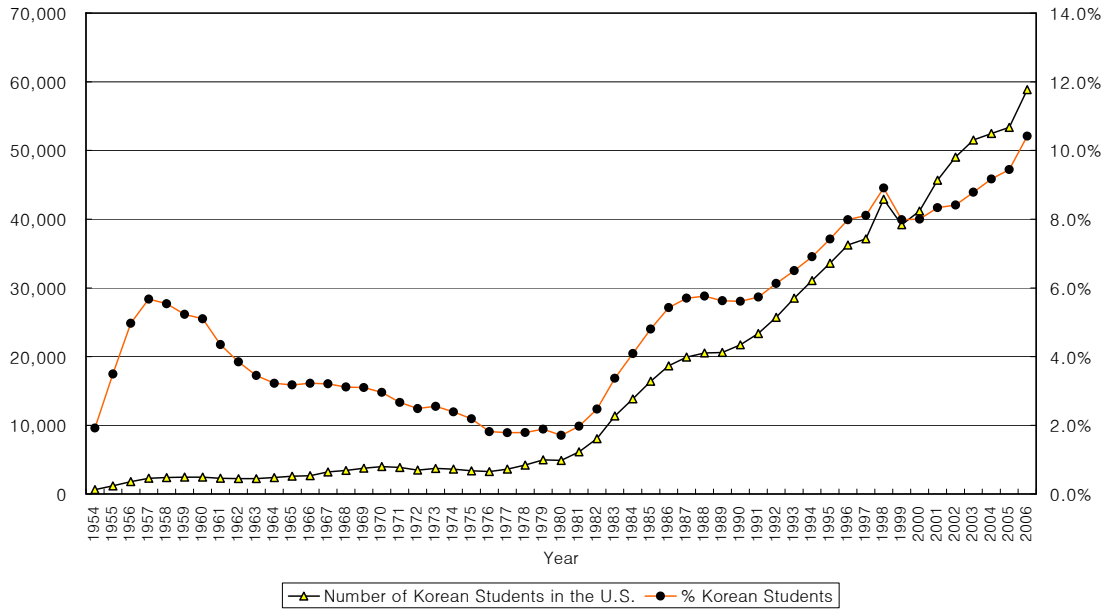


Figure 3

Number of Korean Students in Intensive English Programs in the U.S.

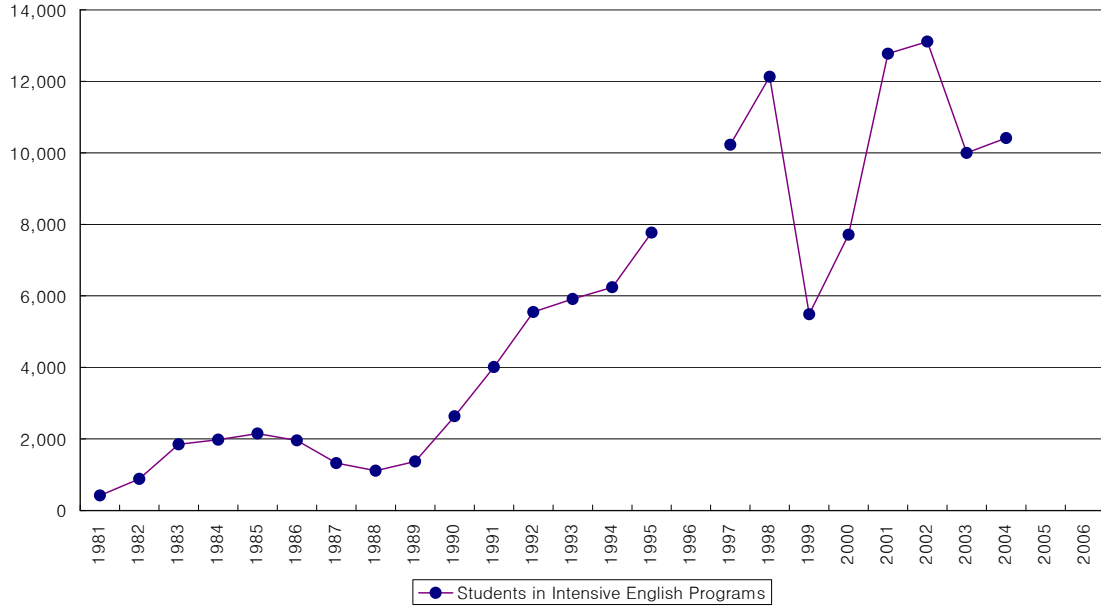


Figure 4

Number of Korean Visiting Scholars in the U.S.

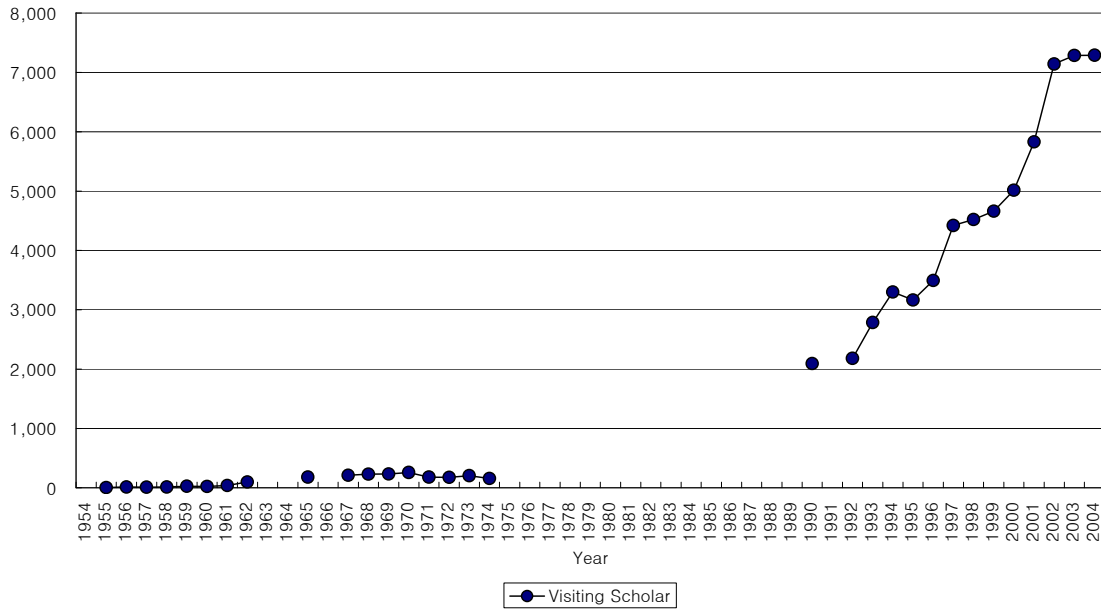




Figure 5  
 Doctoral Degrees awarded to Korean nationals in the U.S.

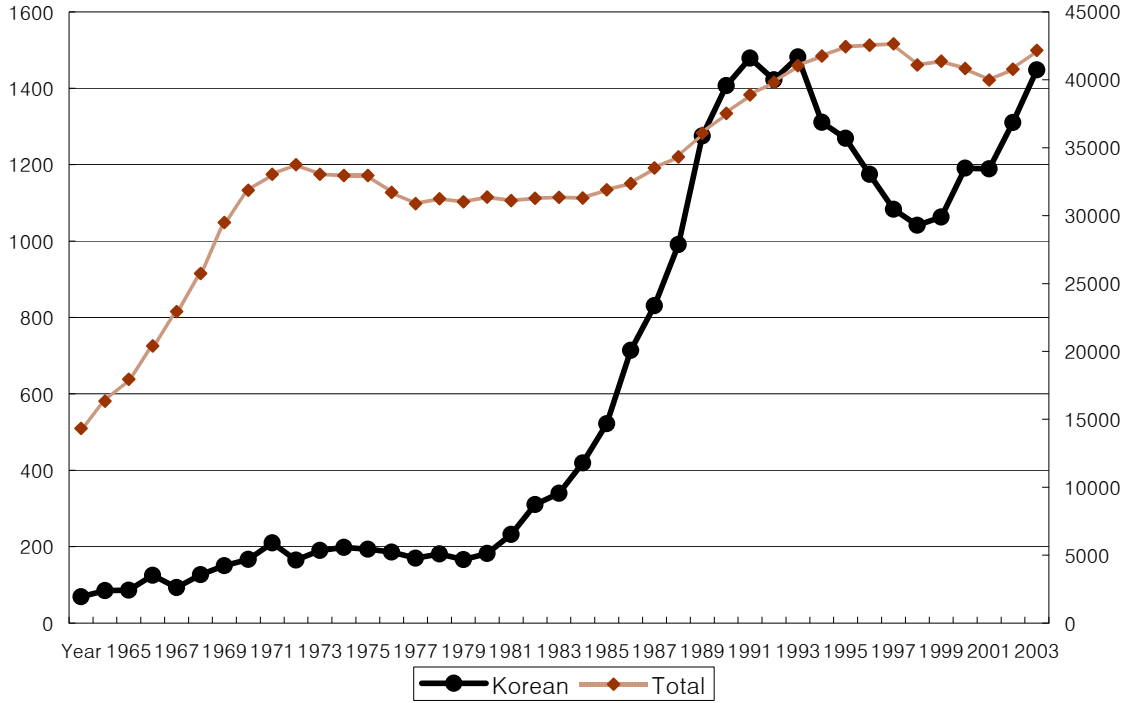


Figure 6

Number of S&E Ph.D.s Awarded to Koreans

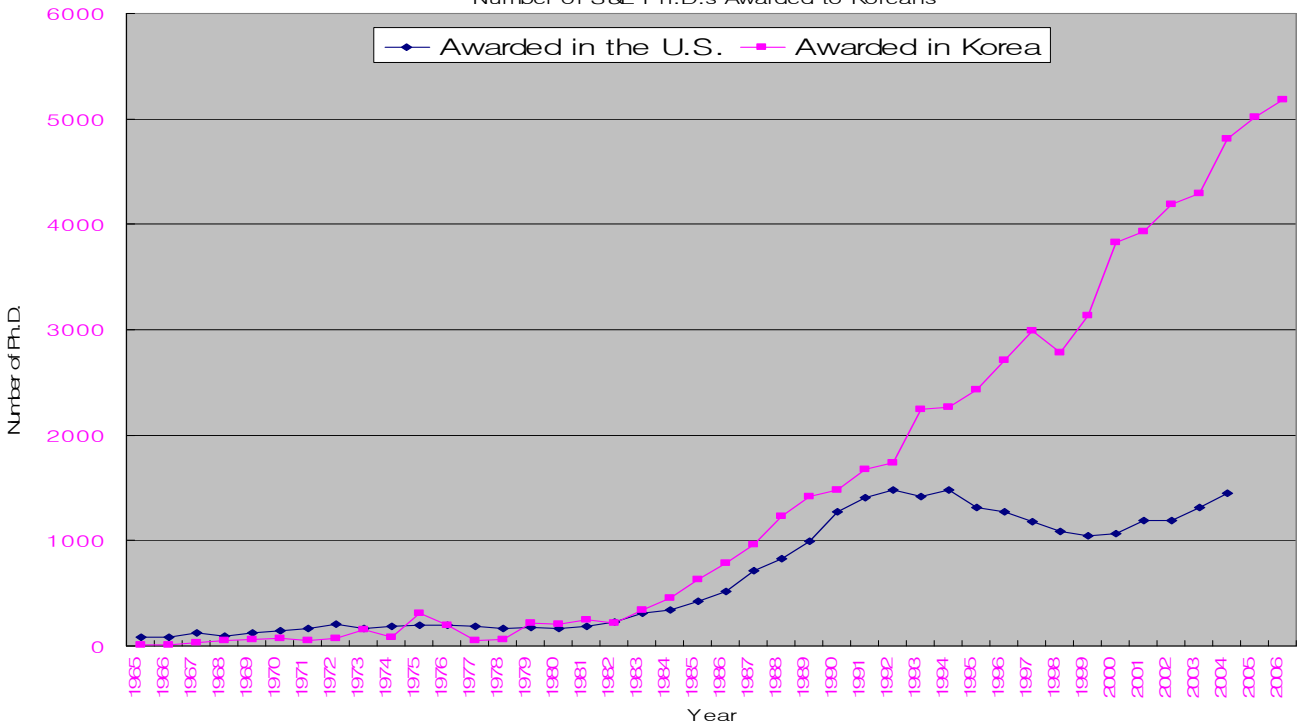
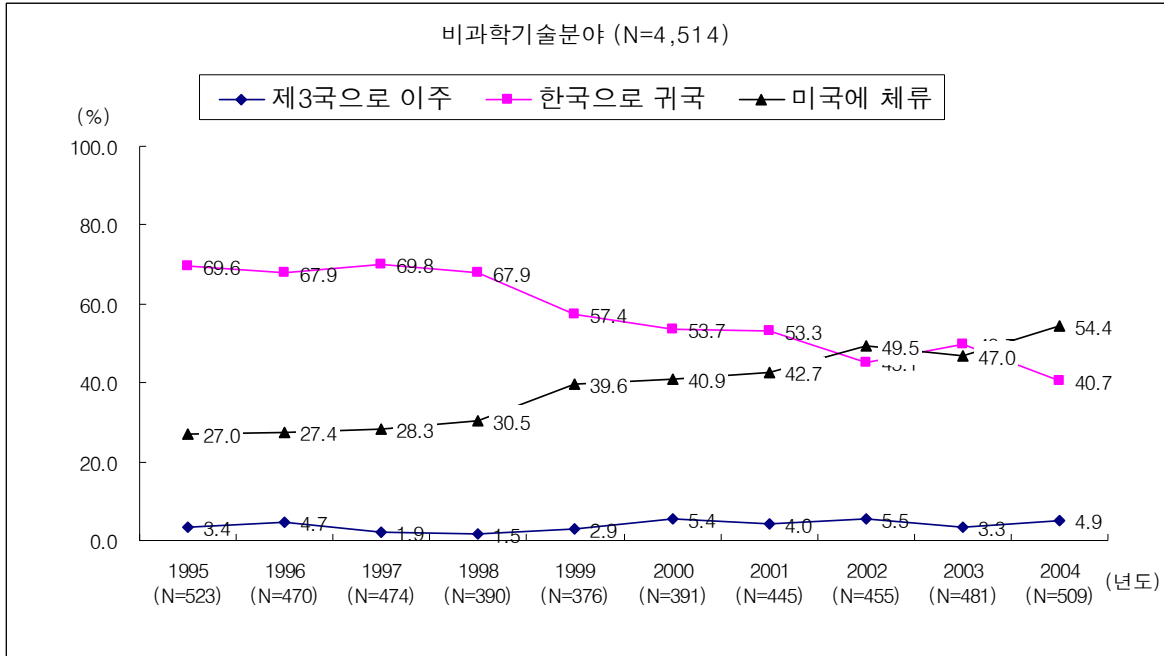


Figure 7 Intention to stay in the U.S. (black triangle) vs. return to Korea (pink square)

Source: Jin et. al (based on NSF, SED)



Non Science and Engineering

Science and Engineering

