

**Sending Country Determinants of International Student Mobility**

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International student mobility has increased fivefold since 1975 and is expected to continue increasing rapidly in the years ahead (See Figure 1). Although this trend has not gone unnoticed (de Wit et al. 2008; Kritz 2006; Verbik and Lasanowski 2007; Vincent-Lancrin 2009), it has received relatively little research attention and many questions regarding its determinants remain unanswered, including where do most international students come from, why do countries differ in their rates of outbound student mobility, and how do development conditions, particularly higher education systems, in students' homelands affect outbound mobility rates. These are important questions to address in order to assess whether students today go abroad to study for the same reasons that students did historically, namely in order to obtain skills and qualifications that they cannot obtain at higher education institutions in their homelands (Harbison and Myers 1964; Thompson and Fogel 1976). To achieve that end, in the early decades of the development era, the 1960s and 1970s, many countries, private foundations, and other agencies sponsored scholarship programs that enabled thousands of students from Asia, the Americas and Africa to study in the United States, Canada or Western Europe. However, most of those programs disappeared in the 1980s because the development community had started to realize that many students were not returning home after completing their studies abroad and, therefore, that investments in training abroad were not improving human capital in developing countries as had been expected. In response, funding agencies shifted their education funding toward efforts to expand elementary and secondary school enrollments based on the premise that investments at those education levels would do more to advance development than ones in higher education.

By the turn of the 21st century, the pendulum had swung back - countries and development agencies were again recognizing that higher education could not be neglected if

developing countries were to compete in an international economy that has become highly globalized and integrally tied to technology fields. Development experts now recognize that they need large cadres of highly skilled engineers, managers, scientists, and other professionals. According to the World Bank (2009, p. xxi): “A wealth of recent research has convincingly established the relationship of the accumulation of physical capital and total factor productivity...to growth.... Because technological change is increasingly skill biased, human capital complements the creation of productive capacity.” However, for a host of reasons, countries at all levels of development continue to differ greatly in their higher education capacity and in the steps they have taken to improve their higher education systems. In order to increase their pool of human capital, some countries are again sponsoring study-abroad scholarship programs for their nationals. Brazil, for instance, launched the Scientific Mobility Scholarship Program in 2011 under which study abroad opportunities will be provided for up to 75,000 Brazilian students who wish to further their training in science, technology, engineering and mathematics (STEM) fields (Monks 2012). Several other countries also sponsor fellowship programs that enable their nationals to study abroad, including Ecuador (Bajak and Solano 2012), Kazakhstan, Kuwait, Malaysia, Saudi Arabia, Thailand and the United Arab Emirates (Adams, Duschang and Weinhold 2008), among others. In addition a number of other public and private agencies have launched scholarship programs for students from developing countries in recent years. To avoid the high non-return rates of the earlier scholarship programs, most of the new ones limit awards to students in STEM fields or sandwich programs. Under the latter, students who are enrolled in study programs in their homelands receive scholarships to go abroad for 1-2 years of specialized training and then return home to complete their degree programs.

It remains unclear, however, whether trends in international student mobility are higher from countries that officially sponsor study abroad programs or whether other development forces have a greater impact on the country outbound mobility rates. As noted above, scholarship funding to permit developing country nationals to study abroad started to dry up by the late 1970s but as Figure 1 shows, student numbers abroad continued to increase during the 1980s and 1990s. Given that those decades were also the period when international migration from developing to industrialized countries started rising in different world regions, it has been argued that students are going abroad to study for the same reasons that labor migrants leave their homelands, namely in search of economic opportunity and higher paying jobs in advanced economies (Rosenzweig 2006, 2008). That thesis is supported by the continued high non-return rates of students as well as by a couple of empirical studies which show that the USA draws larger numbers of students from low-income countries that have large wage gaps with the USA (Lowell and Khadka 2009; Rosenzweig 2006, 2008). However that finding could well be biased given that the studies only looked at student outflows to the USA rather than to several destinations. Although the USA continues to be the world's largest recipient of international students, less than a quarter (21%) of the world's total student stock was enrolled in a study program in the USA in 2008. Moreover, in that year, 29 percent of U.S. students came from just two countries, India and China, and four other countries – South Korea, Japan, Canada, and Taiwan, accounted for an additional 26 percent. Those statistics indicate that there is a great deal of selectivity in the U.S. student flow and that U.S. students are not a random sample of the global pool of mobile students. Studies of the determinants of student flows to the United States could well draw different conclusions than ones that look at the determinants of student outflows to all countries.

This paper addresses the question of what factors underlie international student mobility trends by undertaking a cross-country comparative analysis of the determinants of outbound mobility rates. It does so by drawing on UNESCO data on international students who are enrolled in tertiary study programs outside their homelands.<sup>1</sup> These data are compiled by receiving countries and reported annually to UNESCO.<sup>2</sup> In addition to identifying the sending countries that have the largest numbers of students abroad, the paper calculates rates of outbound student mobility in order to control for the fact that country population size is a major correlate of student numbers abroad. The paper also examines trends in tertiary education enrollments in different world regions since as secondary school completion rates rise, so too does demand for tertiary education. Then the paper takes on the task of accounting for country differentials in outbound student mobility rates by examining the relative importance of a host of development conditions including population size, GDP per capita, international investment, colonial ties, language, human development, and higher education supply and demand. Preliminary analyses carried out thus far indicate that an important factor underlying outbound student mobility has been the rapid growth in demand for tertiary education that has occurred in recent decades and the inability of countries to meet that demand.

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<sup>1</sup> Tertiary education includes all types of post-secondary education, including education provided by universities, technical institutes, teaching colleges, vocational schools and other programs that lead to the award of academic diplomas, degrees, or certificates. Higher education, in contrast, refers to post-secondary education provided by colleges and universities. Countries differ in how they structure their post-secondary education systems. While technical training is offered at higher education institutions in some countries, in others it is offered by technical institutes. UNESCO, which is the main source of comparative data on international student mobility, collects data on country tertiary education programs but does not identify the type of institution where the program is offered.

<sup>2</sup> Data reliability is potentially an issue given how the data are collected and thus several checks will be done on the data before undertaking the final analysis.

## **Trends in International Student Mobility**

Drawing on UNESCO data on international student mobility, Figure 2 ranks the top 26 countries that had the largest numbers of students abroad in 2008 (each country had at least 26,000 students abroad) and shows that Asian and European countries accounted for all but three countries in that listing. Canada, USA and Morocco were the only non-Asian and European countries among the top 25 and no Latin American, Caribbean or Central America country made the top sender group. Morocco was the only African country on the list.<sup>3</sup> China alone had 451,156 students abroad or 16% of the total number of students in 2008. In addition, China had twice as many students abroad as India, the second largest sender, although both countries have populations of comparable size. Most countries, however, had relatively few students abroad. For the 186 countries that had data available for both periods the average number abroad was just under 14,000 students and the median was just under 5,000. Figure 2 also shows another interesting pattern, namely that several of the top senders had fewer students abroad in 2008 than they did in 2003. Japan, France, Morocco, Turkey, Italy, and Greece, for instance, had 12,000 fewer students abroad in 2008 while China, India, South Korea, Vietnam, Kazakhstan, Germany and Uzbekistan each had 18,000 or more students abroad in 2008 than they did in 2003. It is also the case that some countries that were not among the top senders in 2008 had increases in their international student numbers that exceeded those of the top 25 senders (not shown). Figure 3 lists the 25 countries that had the largest percentage increases in student numbers abroad from 2003 to 2008. Recognizing that percentage change figures can be large when starting from a small base (that is the case for several countries in the listing), the increases for some countries

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<sup>3</sup> The Moroccan number is probably inflated because most of its students go to France, which counts children of immigrants as international students even though they may have lived there for several years.

(e.g. Belarus, Uzbekistan, Vietnam, Tajikistan, Saudi Arabia, Mongolia, Kazakhstan, Qatar, Armenia, Ukraine, Ecuador, and Bahrain) may have occurred because scholarship programs were launched in recent years that targeted those countries.<sup>4</sup>

It is generally thought that most international students come from developing countries but Figure 4 indicates that most of them were from the world's two developed regions, the USA/Canada and Europe in 2003 and 2008. However, student numbers grew most rapidly in that period in Asia (by 32%) but hardly at all in Europe. Some Eastern European countries (Belarus, Slovakia, Moldova, Ukraine, and Armenia) experienced large increases in numbers of students abroad (see Figures 2 and 3) but, with the exception of Germany and France, most Western European countries had declining numbers abroad or only small increases. The USA and Canada also sent more students abroad in 2008 than they did in 2003 but their rate of change was modest, just 17%. Elsewhere in the developing world, Middle Eastern countries had the largest number of students abroad, followed by Latin America and sub-Saharan Africa. While numbers grew in the latter, by 24% and 20%, respectively, student numbers from Asia grew by 32%.

Given that countries differ greatly in their population sizes as well as in their tertiary enrollments, it is important not only to look at international student numbers, but also at more refined measures. One standardized measure is the tertiary outbound mobility ratio (TOMR), which specifies the percentage of each country's total tertiary students who are enrolled in study programs. While student numbers abroad tell us where students come from, the TOMR measures the relative importance of outbound mobility in the training of tertiary students. For the 177 countries with populations over a million, 17% of enrolled students, on average, were abroad.

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<sup>4</sup> The USA, for instance, launched a program in the 1990s that provides scholarships to permit Eurasians and C. Asians to study for up to one academic year in the USA.

That percentage however ranged from less than one percent of enrolled students in Cuba, the United States, the Philippines, Egypt, Brazil, Argentina, Germany and Russia, to a high of 39% in Swaziland. Figure 5 shows the ranking for the 30 countries that had the highest percentages of tertiary students enrolled abroad in 2008. Several countries in that listing have relatively small populations, which tend to send more students abroad, but there are also many countries in the top 30 that have relatively large populations, including Morocco (31.6m), Uzbekistan (17.2m), Cameroon (19.1m), Malawi (14.8m), Niger (14.7m), Zambia (12.6m), and Zimbabwe (12.5m). While Figure 4 shows that sub-Saharan Africa (SSA) had the smallest number of tertiary students abroad, Figure 6 shows that among enrolled tertiary students, SSA had the highest percentages abroad, 20% in 2003 and 14% in 2008. This apparent anomaly occurs because SSA has fewer tertiary students than other world regions but sends a very high share of those who are enrolled to Western Europe and to other countries in the region. Latin American countries, in contrast, are the least likely to have tertiary students abroad (1.3%) but the USA and Canada also send few students abroad (1.8% in 2008). The statistics in Figures 5 and 6 underscore the importance of looking not only at numbers abroad but also at study abroad rates and the levels of tertiary enrollment that occur in different world regions.

### **Regional Trends in Higher Education**

In addition to rapid growth in international student mobility, recent decades have witnessed unprecedented growth in population and development. Rapid population growth in developing countries has created youthful age structures and as those young people age, demand for education increases at all levels. Governments and international assistance agencies have responded by investing heavily in primary education and secondary education and today, except

for parts of the Sahel, some rural areas, and some patriarchal societies that do not educate girls, most children complete primary education. Secondary school completion rates have also risen rapidly and as secondary completion rates rise, so too does demand for post-secondary education and the pool of eligible tertiary students. Much of the growth in secondary and tertiary education has occurred, in turn, in urban areas where parents and children have ready access to information and communication channels that drive home the point that education is critical in a world where advanced technology drives economic growth and is needed to obtain good paying jobs in the wage economy.

There are, however, considerable differences across world regions in education growth trends (see Figure 7). Whereas in 1970 North America and Europe had the largest number of tertiary students (13.6 million), by 2000 the East Asia and Pacific region had surpassed them due to its exponential growth in student numbers. From 1970 to 2009, the number of tertiary students grew by 1,254 percent in East Asia and the Pacific but only by 160 percent in North America and Europe. Sub-Saharan Africa had an even larger growth in student numbers (2,309 percent) but because it had a very small starting base in 1970, only 196,000 tertiary students, its student numbers in 2009 remained low compared to other regions. Student numbers also grew rapidly in Arab States (1,510 percent) and Latin America and the Caribbean (1,139 percent). Figure 2 shows that although there were already sharp regional differentials in student numbers in 1970, those differentials became larger by 2009 due to how regions responded to growing tertiary demand. Countries in the East Asia and Pacific regions clearly did the most to accommodate tertiary demand while countries in Central Asia, sub-Saharan Africa and Arab states had the poorest responses.

Gross enrollment ratios (GER) at the tertiary level also grew rapidly in all world regions from 1970 to 2009 and are expected to continue increasing as developing countries strive to improve their human capital and as students seek job credentials that will give them an edge in the competitive modern economy. The GER is a ratio of the number of students enrolled in tertiary institutions in each country relative to the number of students of tertiary age in each country's population. Students enrolled abroad are not included in the numerator nor is the denominator limited to students who have completed secondary schooling and thus who are eligible to apply to a tertiary program. Figure 8 shows that GER's are highest in North America and Europe but also high in Central and Eastern Europe. It also shows that while GER's have risen in most regions since 1970, the gap between the most economically advanced region (North America and Europe) and developing regions was even greater in 2009 than it was in 1970. Whereas in 1970, all world regions except North America and Europe had GERs below 10%, in 2009 sub-Saharan Africa was the only region still in that category even though its ratio grew by 500 percent from 1970 to 2009. Again, Africa's low starting base of one percent in 1970 accounted for why its GER remained below low in spite of having made significant gains. Latin America's GER also grew by 500 percent but because it had a higher starting base (6%), its enrollment ratio rose to 37 percent in 2009. Indeed, by 1980, Latin America had moved ahead of other developing regions in enrollments and it has steadily increased its lead since then. Although GERs in East Asia and the Pacific almost doubled from 1970 to 2009, that region was still outranked in 2009 by three regions - North America and Europe, Central and Eastern Europe and Latin America. The trends for other regions with lower GERs in Figure 2 suggest that there was some slowing down in enrollments after 2005 but not too much should be made of that

pattern given that it is only for a four-year period and it is not uncommon for countries to revise their data in subsequent years.<sup>5</sup>

These statistics indicate that tertiary education demand is rising fastest in regions that can least afford the financial investments required to build the institutions and human capital necessary to bring their GERs up to the levels of North America and Europe. According to the UNESCO Institute for Statistics, one-half of total global public education spending in 2004 occurred in North America and Western Europe although less than 10 percent of the world's children and young people lived in that region (UNESCO Institute for Statistics 2007, p. 11). It also reported that the entire sub-Saharan Africa region spent less on education than either France or the United Kingdom did in 2004, and that inequalities in public spending on education are highly correlated with global wealth disparities. Based on a comparison of the percentage of gross domestic product (GDP) expended on education by world regions, UNESCO found that while 4.3 percent of global GDP was expended on education, including all levels, developing regions spent less than that and only North America and Western Europe spent significantly more – the latter's expenditure rate was 5.6 percent of GDP.

Improving tertiary education capacity, however, takes more than money and requires years to develop. To expand capacity and build top quality tertiary programs requires facilities, laboratories, and libraries and, above all else, professors with advanced graduate degrees who are in very short supply in many developing countries. However, developing countries have found it difficult to increase their pool of professors because many nationals who go abroad for graduate

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<sup>5</sup> UNESCO asks countries to report their enrollment statistics annually but many do not comply or only do so 3-4 years later. Therefore, in order to issue annual statistics, UNESCO extrapolates country data based on the assumption that trends have remained stable.

studies do not return home following completion of their studies. Human capital shortages are particularly acute in science, technology, engineering and management (STEM) fields that lead innovation and development efforts. Professors working in STEM fields not only require years of advanced training at home or abroad but also laboratories for carrying out basic and applied research and ready access to international research materials and scholarly networks.

### **International Student Mobility and Other Global Trends**

Growth in international student numbers may also be connected to globalization forces that stimulate and facilitate cross-border mobility in trade and people. Today an estimated 3.1 percent of the world's population or 214 million people live outside their country of birth (Henning 2012). Additional but unknown numbers of the world's population have lived outside their homelands for some part of their life. The growing prevalence of international migration and mobility means that more people are exposed to information and networks that enable them to learn about educational opportunities in other countries and gain access to scholarships and people who can facilitate study abroad. As domestic demand has plateaued in developed countries due to population stabilization and high gross tertiary enrollments, universities in North America and Western Europe have looked for opportunities to market their services abroad. As such, many universities in North America, Western Europe and other world regions now recruit international students aggressively in order to raise revenue for their costly programs (Clark and Sedgwick 2005; Knight 2008; Marginson and van der Wende 2009). International students are attractive because they usually pay full education costs. While poverty continues to be a major problem on the development agenda, trickledown economics has expanded the numbers of

middle and upper income families in developing countries who can afford to send their children abroad to study.

**Future Paper directions:**

The analytic part of the paper remains incomplete but will involve the use of regression analysis to look at the relative importance of education supply and demand in sending countries along with other factors for international student mobility. The principal analytic variable is the tertiary gross enrollment ratio (TGER), which is measured as the percentage of the tertiary-age cohort enrolled in tertiary studies and is used as a measure of home tertiary supply. Tertiary education demand, on the other hand, is measured by the secondary gross enrollment ratio (SGER), which is measured as the percentage of the secondary-age cohort enrolled in secondary studies.

Although ideally one would measure demand by the secondary completion rate and consider other factors that assess the “quality” of available education, those measures are not readily available for a large number of countries. The TGER and SGER have also been used in previous studies (Kritz 2011; Lee and Tan 1984; Lowell and Khadka 2009). The study expectation is that tertiary supply will have a negative effect on student outflows but tertiary demand will have a positive effect.

Population size and GDP per capita, purchasing power adjusted, are also expected to be important correlates of outbound student mobility. Population size tends to have a curvilinear relationship to student outflows (Kritz 2011) – both larger countries and very small countries send more students abroad. A dummy variable set to one for countries under one million is used to control for that status. Positive relationships are expected for both the population size and small country measures. A positive relationship is also expected between GDP per capita and

student outflows. Another dummy variable is used to evaluate whether student outflows are higher in developing countries and is expected to be negatively related to student outflows. The developing country measure is set to zero for countries in Europe, North America (Canada and USA), Australia, Japan, and New Zealand. Although it could be argued that some Eastern European and Asian countries now have development indicators comparable to those in the developed category, the classification used conforms to usual geographic divisions of developed versus developing. I plan to explore, however, whether alternative specifications would make a difference. Given that the models include a measure of GDP per capita, other development differences are picked up by that measure. Logs are used for all continuous measures in order to correct for skewness in the data.

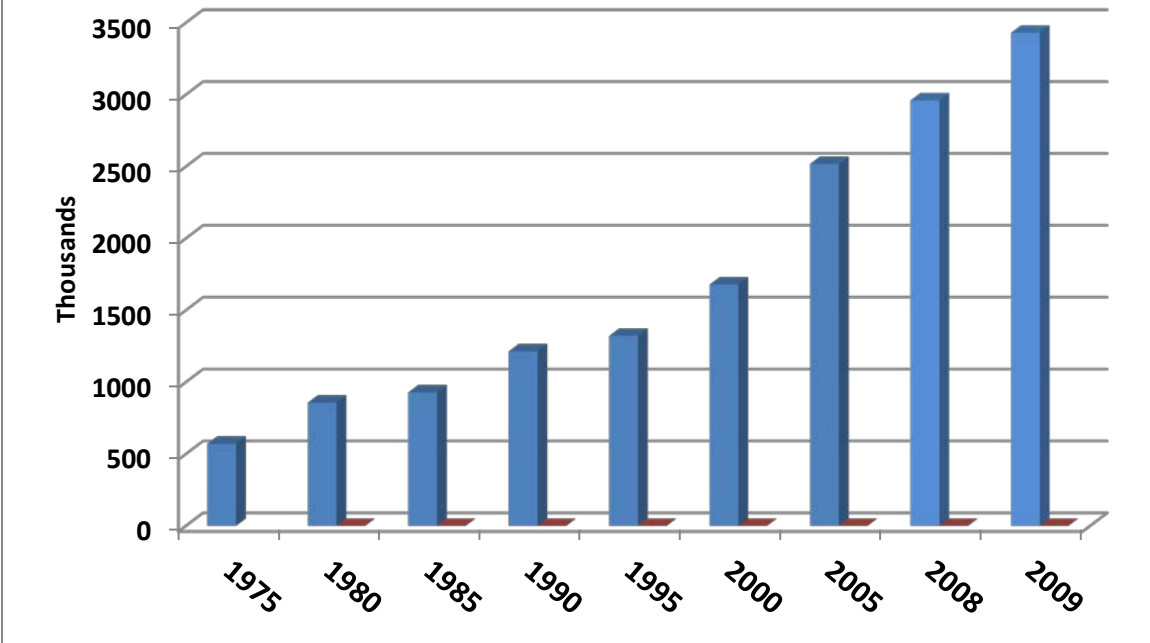
A number of other structural conditions will also be evaluated in the models. Colonial ties, for instance, may continue to give students in former French and British colonies opportunities to study abroad. While that could be the case too for Spanish-speaking Latin American countries, the distance between Spain and its former colonies is greater than that between the UK and France and their former colonies. Distance is known to be a factor that deters international migration. I will also explore whether international assistance and foreign direct investment have an effect on student mobility. Country human development indexes will be evaluated in the regression models to capture the importance of social dimensions. In addition to exploring the importance of other factors, some modeling issues remain to be worked out, including whether findings based on fixed effect models differ from random effects models and whether change models produce different findings from cross-sectional ones.

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**Figure 1. Global numbers of international mobile students, 1975-2009**



**Figure 2: Countries with the largest numbers of international mobile students, 2003 and 2008**

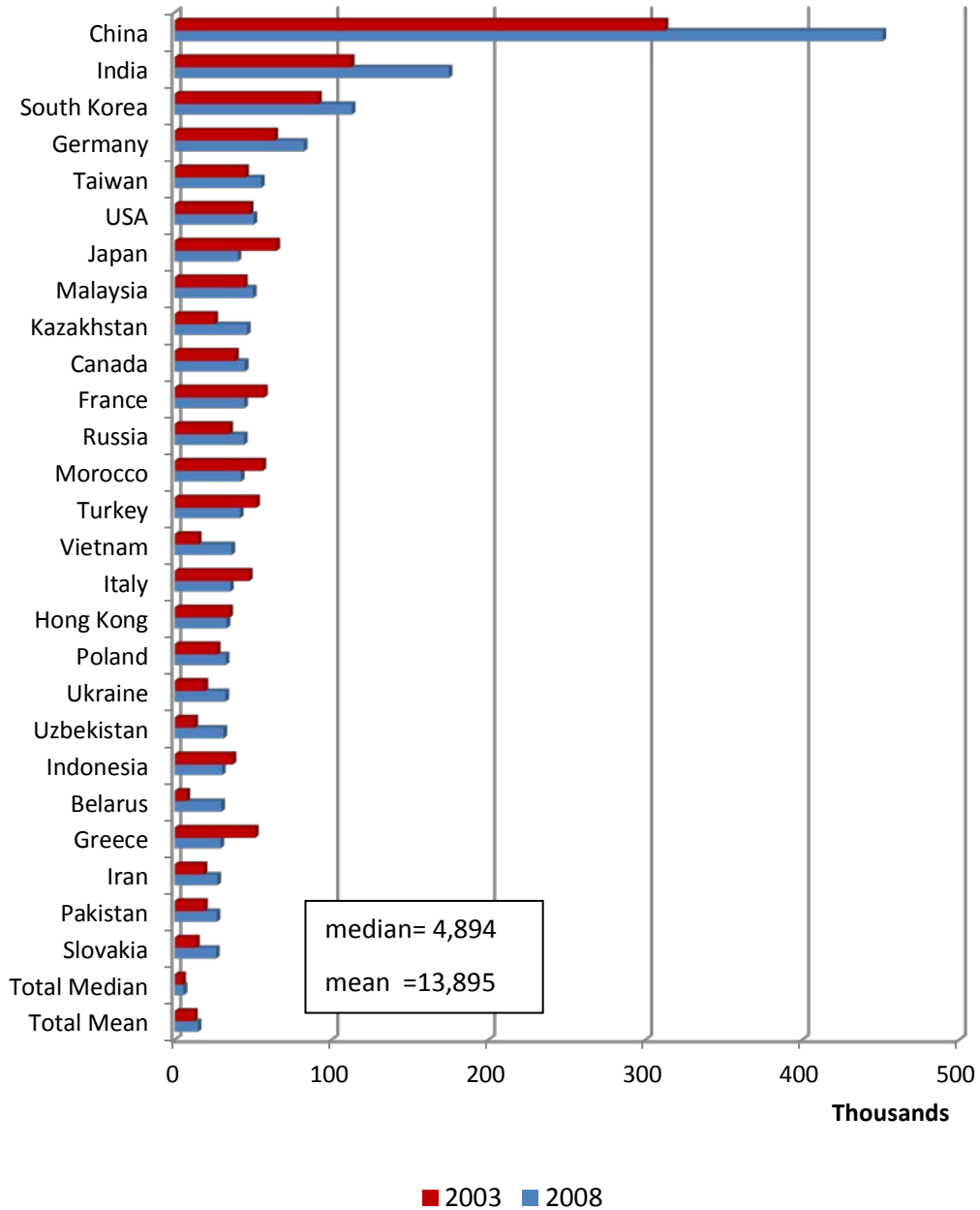


Figure 3. Countries with the largest percentage increases in student numbers abroad, 2003 to 2008

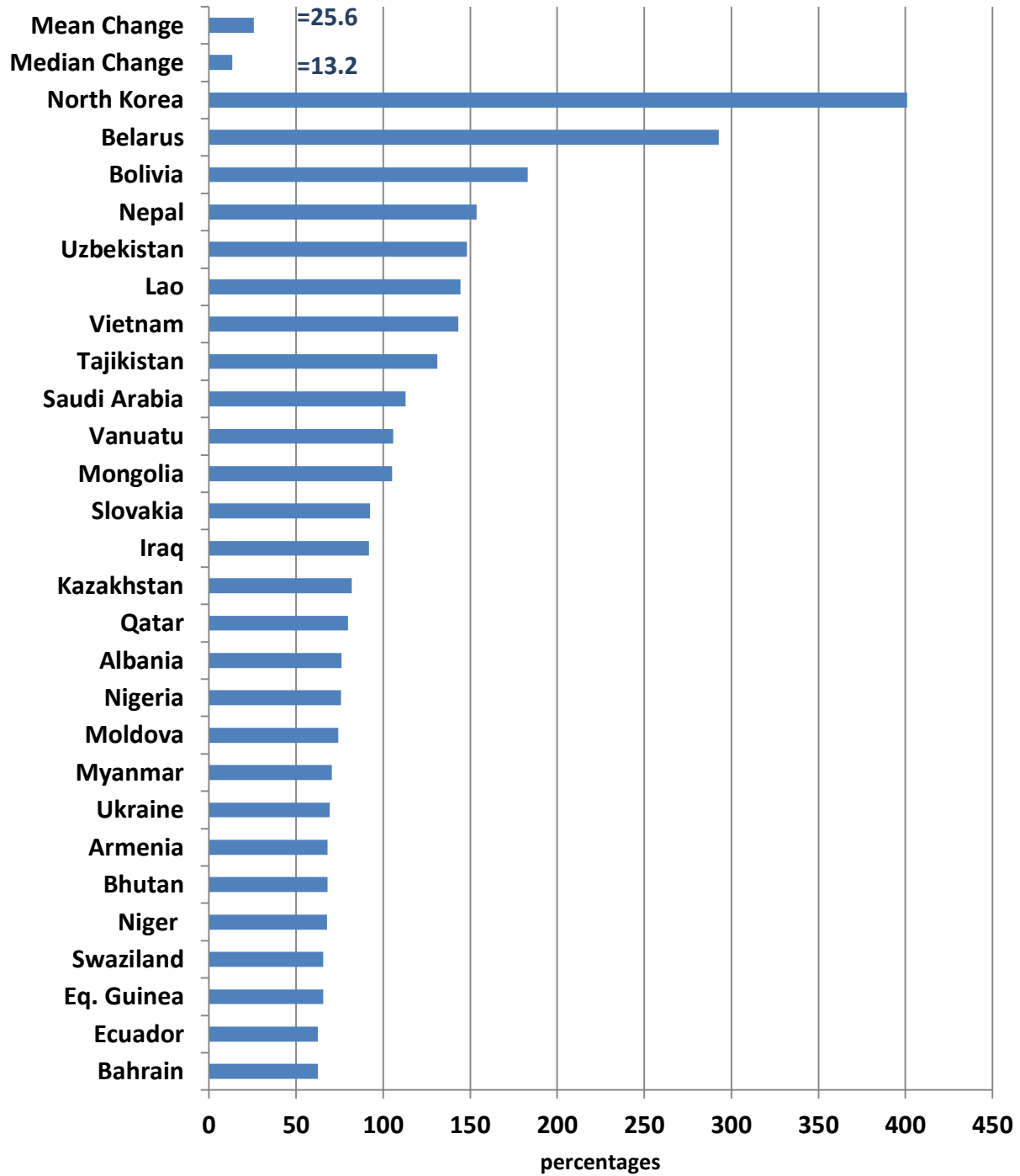


Figure 4. Numbers of and Change in Student Numbers Abroad by Geographic region, 2003 and 2008

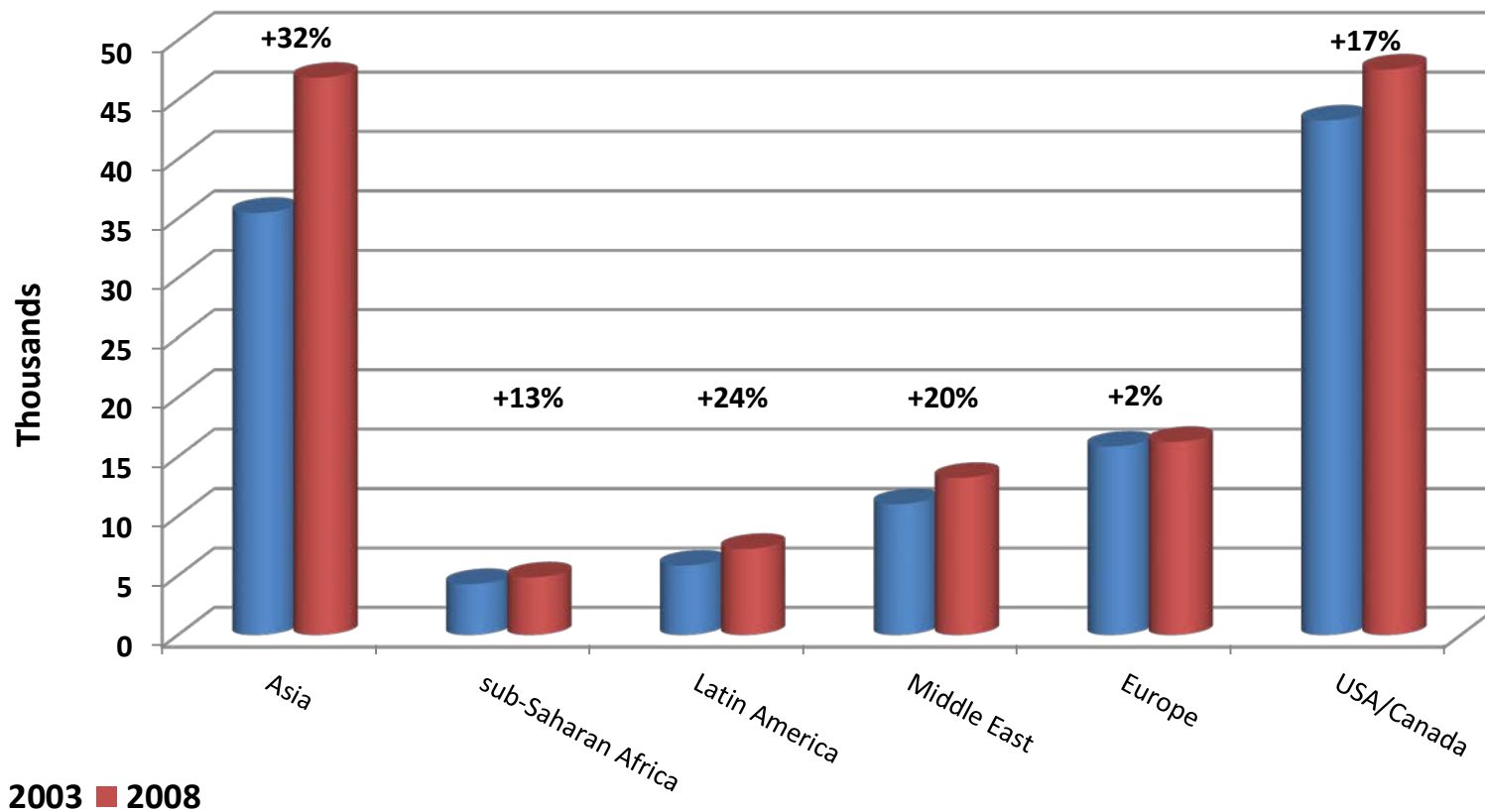


Figure 5: Countries with the largest percentage of tertiary students enrolled abroad, 2008

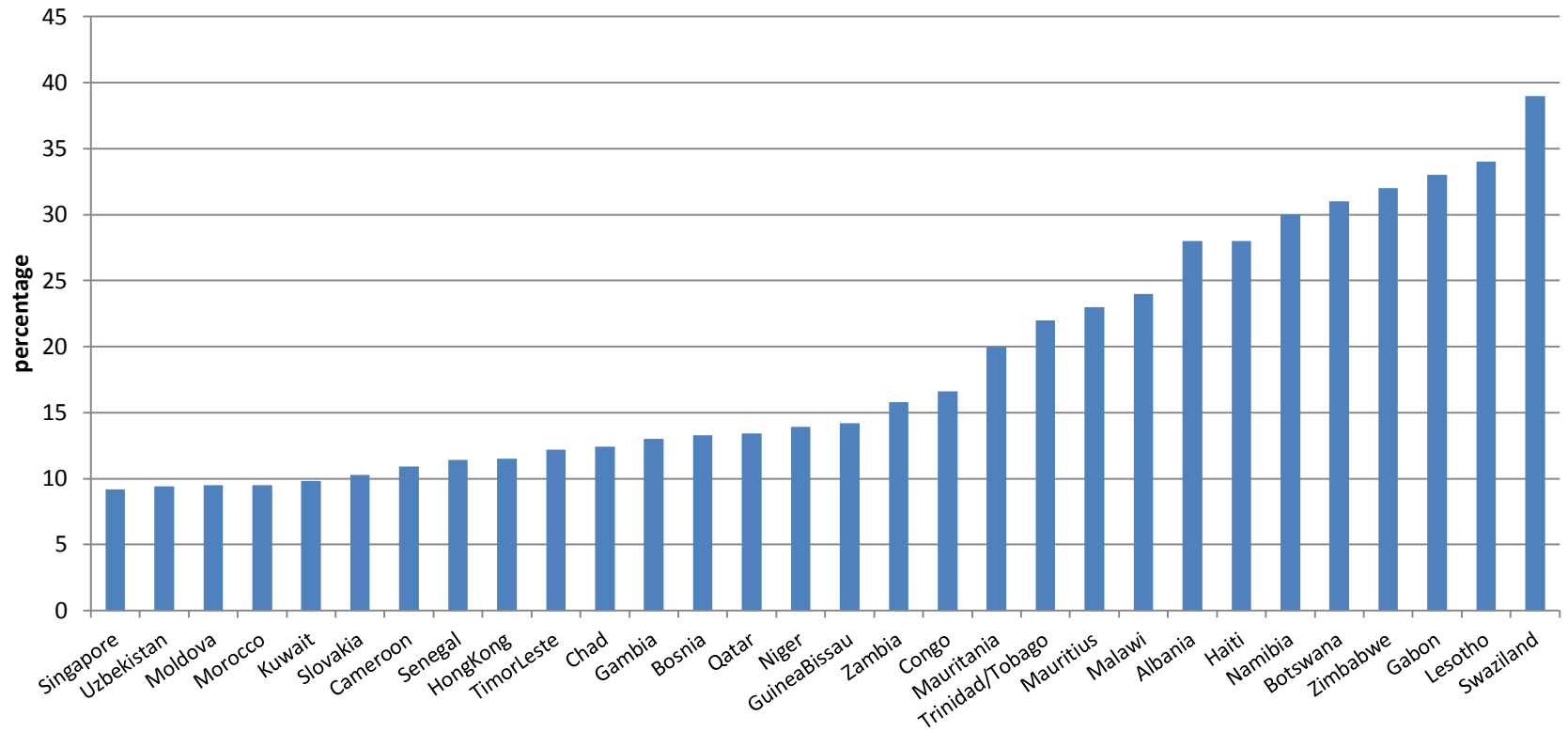
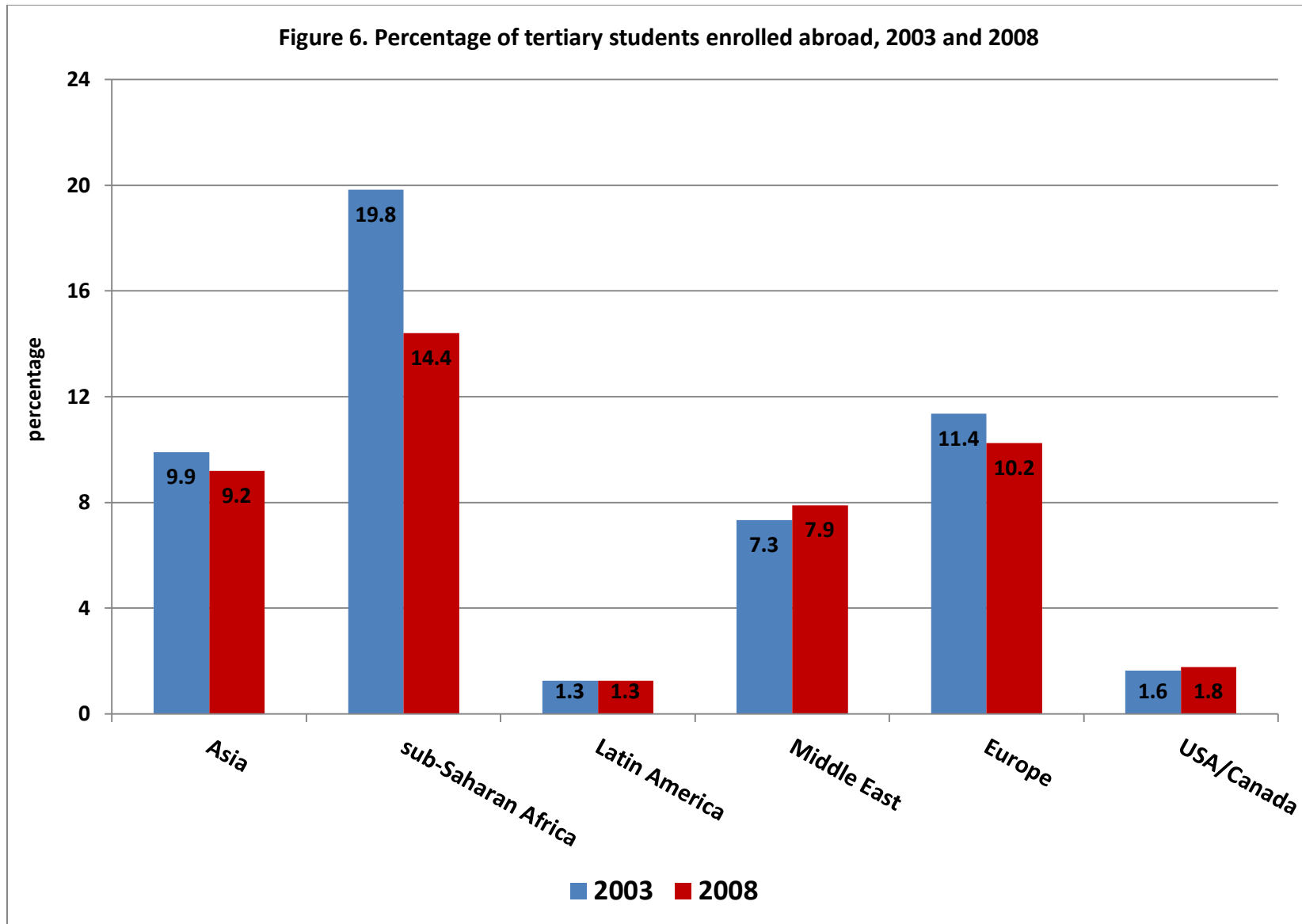
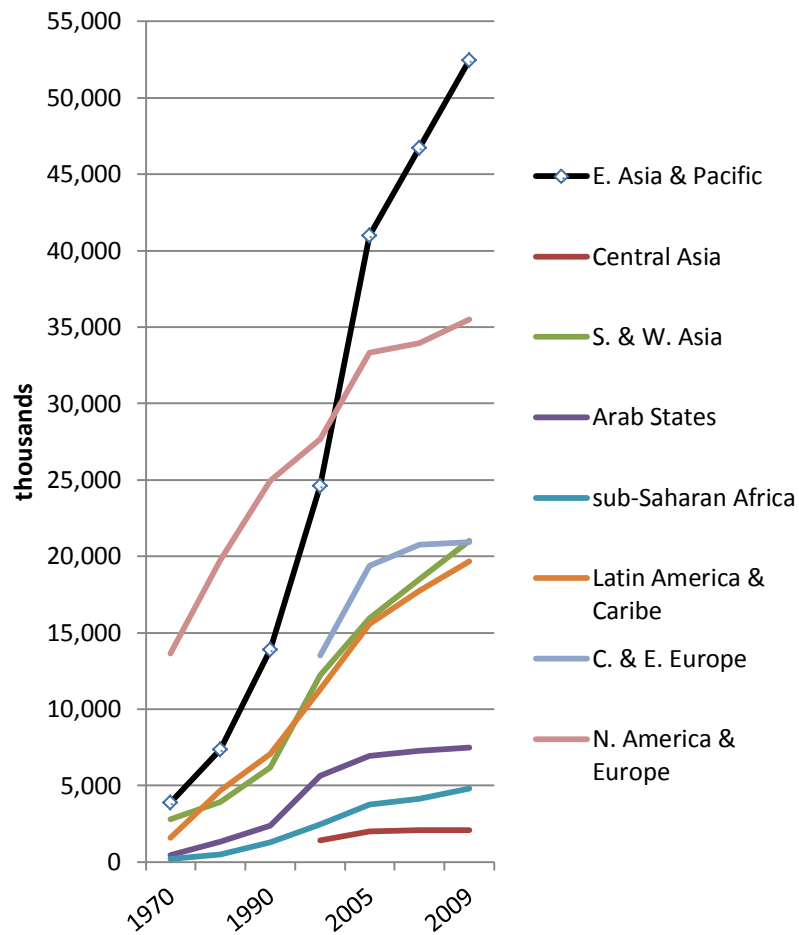


Figure 6. Percentage of tertiary students enrolled abroad, 2003 and 2008



**Figure 7: Absolute Tertiary Enrollment by World Region, 1970 to 2009**



**Figure 8: Tertiary Gross Enrollment Ratios, 1970 to 2009**

