

# International flow of students – An analysis related to China and India

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*Due to globalization, cross-border flow of students for higher studies has been boosted. As a result, major emphasis is on opening up markets for foreign students in several countries. USA is the largest recipient and host country for foreign students. The major flow of students is from developing and newly industrialized countries of Asia; China and India send the maximum number of students abroad for higher studies. It is also observed that China, Taiwan and India are the largest recipients of US science and engineering doctorate degrees. An attempt is made to estimate the number of students going to foreign universities for higher education using a mathematical modelling approach. This analysis shows that China and India may be a big market for flow of students to the US and Europe.*

**Keywords:** Cross-border flow, foreign students, globalization, higher studies.

CROSS-BORDER flow of students and scholars has existed since historical periods; for example, exchange of scholars between India and China was prevalent from the first millennium. Besides, several scholars visited China and India from other parts of the world and vice versa. Recently, the process of globalization has accelerated the flow of students from developing and Sub-Saharan countries to the US and Europe. According to United Nations Educational Scientific and Cultural Organization (UNESCO), students from Sub-Saharan Africa are the most mobile; one out of 16 is studying in an overseas university, while only one out of every 250 students in North America (the US, Canada and Mexico) goes overseas for higher education<sup>1</sup>. The major share of international flow of students is from developing countries, particularly from China and India, due to the push and pull factor<sup>2</sup>. Therefore, the impact of globalization on education has increased the global market for higher education. Foreign education is a growing sector of international economy. Consequently, many countries are trying to open up markets for foreign students by laying emphasis on attracting more foreign students, and maximizing the market potential of foreign study. Flow of students to foreign universities may have economic implications in future, that need appropriate analysis. Since China and India are a source of big market for foreign study, an attempt has been made to analyse the emerging trends of flow of students from those two countries.

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## International flow of students

Flow of students increases competition for resources, students and status. Hence many European and American universities are making policies to attract more foreign students to their campus. Accordingly, thousands of students from developing and African countries are looking towards the US, Europe and Australia for higher studies to get better opportunities, though few students from these regions are coming to Asia. USA, UK, Germany, France, Australia, Japan and China attract the highest number of foreign students (Figure 1).

The US has been a favourite destination for international students, though, of late, its share has been on the decline<sup>3</sup>. However, the US, European Union and Australia host nearly 81% of all foreign students<sup>4,5</sup>. India, China, South Korea, Japan and Canada are the top five countries contributing the largest share of students in enrolment to USA, Australia, UK and Canada (Tables 1 and 2).



**Figure 1.** Global destinations for international students (2004). Source: <http://www.atlas.iienetwork.org/?p=48027>

**Table 1.** Flow of students to USA and Australia

Source country	USA			Source country	Australia		
	2003	2004	Change (%)		2003	2004	Change (%)
India	74,603	79,736	7	China	22,548	30,041	33
China	64,757	61,765	-5	India	12,307	17,870	45
South Korea	51,519	52,484	2	Malaysia	15,448	15,909	3
Japan	45,960	40,835	-11	Hong Kong	10,183	11,000	8
Canada	26,513	27,017	2	Indonesia	11,391	10,587	-7
All	586,323	572,509	-2	All	136,125	151,798	12

Source: <http://aei.dest.gov.au/>**Table 2.** Flow of students to UK and Canada

Source country	UK			Source country	Canada		
	2003	2004	Change (%)		2003	2004	Change (%)
China	35,740	48,175	35	China	10,035	14,575	45
USA	18,940	19,955	5	USA	6690	7295	9
India	12,775	14,675	15	France	5500	6040	10
Malaysia	11,970	11,860	-1	India	1905	2565	35
Hong Kong	10,280	10,660	4	S. Korea	1675	1925	15
Non-EU	191,865	214,190	12				
EU	113,530	111,570	-2				
All (inc EU)	305,395	325,760	7	All	59,960	70,035	17

Source: <http://aei.dest.gov.au/>

It is evident from Tables 1 and 2 that the global education market over the last few years has registered phenomenal growth, which may contribute significantly to the economy of the host country. According to IDP Education Australia, flow of international students contributed over US\$ 11 billion to the US economy and over AUD\$ 4.2 billion to the Australian economy in the year 2000. As a result, these economic factors have added to the competition in global education<sup>6</sup> by attracting foreign students. According to an estimate<sup>2</sup>, more than two million students are enrolled for higher education outside their home countries and this number might double by 2015 and double again by 2025. To attract more foreign students host countries, including the US, UK, and Australia, are reviewing and revising their national policies to ensure continued increase of foreign students to their institutions. Some Asian countries like China and India are also trying to attract overseas students.

### Flow of students from China and India

China and India are the major sources of foreign students to overseas countries and they have been contributing significantly, in particular, to US research, which is supporting the US for global competitiveness. Science and engineering are the choice subjects of students from China and India to study abroad for doctorate degree. A disci-

pline-wise distribution of students who obtained US doctorate degrees during 1983–2003 and the flow of students from China and India are given in Tables 3 and 4 respectively.

Simultaneously, the flow of students and scholars into China and India has also begun. Foreigners began joining Chinese universities for education in the late seventies and the number is growing steadily. It is estimated that approximately 140,000 international students had enrolled for higher studies in China by 2005. South Korea is the largest source of foreign students to China, contributing 39.3%. The leading source countries of foreign students to China are listed in Table 5.

On the other hand, India is lagging behind China in attracting foreign students (around 13,267 in 2005). The major source countries of foreign students to India are given in Table 6.

### Data analysis and results

To analyse future trends of flow of students from China and India to the US and vice versa, data pertaining to flow of students for the period 1995–2005 were analysed by using an exponential growth model. An exponential growth function implies fast growth and is given by:

$$y = ae^{bx},$$

**Table 3.** Asian recipients of US doctorate degrees in various fields

Field	Asia	China	India	Taiwan	South Korea
Science and Engineering	120,698	35,321	17,515	19,711	17,112
Engineering	44,213	10,202	7685	9156	6469
Science	76,485	25,119	9830	10,555	10,643
Agricultural sciences	5142	1148	411	745	670
Biological sciences	19,020	8728	2330	2661	1898
Computer sciences	5169	993	1399	958	674
Earth and atmospheric sciences	2832	1221	236	418	340
Mathematics	5823	2372	570	773	740
Medical/life sciences	3547	678	628	697	353
Physical sciences	18,613	7855	2459	2429	2261
Psychology	1871	254	224	276	288
Social sciences	14,468	1870	1573	1598	3419
Other	21,128	2189	2867	3334	4698
All fields	141,826	37,510	20,382	23,045	21,810

Source: [www.nsf.gov/statistics/seind06/c2/tt02-04.htm](http://www.nsf.gov/statistics/seind06/c2/tt02-04.htm)

**Table 4.** Flow of students from China and India to USA and vice versa

Year	China			India		
	No. of students	Percentage of foreign students in the US	Number of US students to China	No. of students	Percentage of foreign students in the US	Number of US students to India
1994/95	39,403	8.7	1257	33,537	7.4	409
1995/96	39,613	8.7	1396	31,743	7.0	470
1996/97	42,503	7.8	1627	30,641	6.7	601
1997/98	46,958	9.8	2116	33,818	7.0	684
1998/99	51,001	10.4	2278	37,482	7.6	707
1999/00	54,466	10.6	2949	42,337	8.2	811
2000/01	59,939	10.9	2942	54,664	9.9	750
2001/02	63,211	10.8	3911	66,836	11.5	627
2002/03	64,757	11.0	2493	74,603	12.7	692
2003/04	61,765	10.8	4737	79,736	13.9	1,157
2004/05	62,523	11.1	n/a	80,466	14.2	n/a

Source: <http://opendoors.iienetwork.org/>  
n/a, not available.

**Table 5.** Major source countries to China (2005)

Rank	Country	Percentage
1	South Korea	39.30
2	Japan	17.20
3	The United States	7.70
4	Vietnam	3.90
5	Indonesia	3.40
6	Thailand	2.10
7	Russia	2.06
8	Germany	1.97
9	France	1.76
10	Nepal	1.35

Source: <http://www.atlas.iienetwork.org/>

**Table 6.** Major source countries to India (2005)

Rank	Country	Percentage
1	United Arab Emirates	11.30
2	Nepal	10.19
3	Iran	8.44
4	Bangladesh	7.10
5	Oman	4.86
6	Sri Lanka	4.38
7	Mauritius	3.97
8	Saudi Arabia	3.15
9	Kenya	3.15
10	The United States	2.99

Source: <http://www.atlas.iienetwork.org/>

where  $x$ ,  $y$  are variables and  $a$ ,  $b$  represent model parameters which are estimated with SYSTAT<sup>7</sup> using the quasi-Newtonian method. Parameter estimates and projections are listed in Table 7.

The internationalization of education has created a worldwide market for higher education<sup>8</sup>. Thus universi-

ties from different countries are building links with each other to enhance their global reach in the area of higher education. Moreover, foreign students are contributing in ample measure to the host country's economy. According to Open Doors Report (2005)<sup>5</sup>, foreign students contributed \$13.3 billion to the US economy in 2004/05. The

**Table 7.** Projection for flow of students from China and India

Year	China (nos)		India (nos)	
	From China	From the US	From India	From the US
2007	75,391	6214	109,535	1200
2008	79,365	7049	123,230	1296
2009	83,549	7997	138,636	1399
2010	87,954	9072	155,969	1511
2011	92,590	10,291	175,469	1632
2012	97,472	11,675	197,406	1763
2013	102,610	13,244	222,087	1904
2014	108,019	15,025	249,853	2056
2015	113,714	17,044	281,090	2220
a	38,660.406	1205.971	23,684.075	441.684
b	0.051	0.126	0.118	0.077
MSE*	$0.16044 \times 10^{11}$	$373757 \times 10^8$	$16042 \times 10^{11}$	2501355.258

\*MSE, Mean square error.

US, UK and Australia, anticipating huge market for education, are demanding further liberalization of trade in cross-border education through General Agreement on Trade in Services (GATS). Consequently, China and India have accepted the policy of liberalization; therefore, they must be ready to develop technical education in the country with possible economic implications. Further analysis shows that students from India to the US may be doubled (2.8 lakhs) compared to those from China (1.1 lakhs), while China may attract more students from the US than India by the year 2015.

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ACKNOWLEDGEMENTS. I am grateful to the anonymous referee for constructive suggestions and my colleague Dr P. Banerjee for encouragement.