

PART III
INFRASTRUCTURE

CONTENTS

PART III	1
INFRASTRUCTURE	1
6. EDUCATION AND GROWTH OF SERVICES	7
I. SOUTH ASIAN SERVICE GROWTH AND EDUCATION	7
A. INTRODUCTION	7
B. EDUCATION AND GROWTH.....	9
II. THE STATE OF HIGHER EDUCATION IN SOUTH ASIA	11
A. GLOBAL TRENDS IN EDUCATION AND TRAINING.....	11
B. HIGHER EDUCATION IN SOUTH ASIAN COUNTRIES	15
C. THE DEMAND FOR HIGHER EDUCATION IN SOUTH ASIA	16
D. THE SUPPLY OF HIGHER EDUCATION	18
III. THE SITUATION OF HIGHER EDUCATION IN THE FIVE LARGEST SOUTH ASIAN COUNTRIES	19
A. BANGLADESH	19
B. INDIA	20
C. NEPAL.....	21
D. PAKISTAN	21
E. SRI LANKA	21
F. COMMON CHALLENGES, DIFFERING APPROACHES	22
IV. TACKLING THE CHALLENGES: THE EXAMPLE OF THE ICT SECTOR IN INDIA .	24
V. THE POTENTIAL OF DISTANCE EDUCATION IN SOUTH ASIA	28
A. THE POTENTIAL.....	28
B. THE SITUATION IN SOUTH ASIAN COUNTRIES.....	28
C. LESSONS AND IMPLICATIONS FROM SOUTH ASIAN EXPERIENCE.....	29
VI. TRADE IN EDUCATIONAL SERVICES IN SOUTH ASIA	29
A. STUDENTS FROM SOUTH ASIAN COUNTRIES STUDYING ABROAD.....	29
B. THE GATS AS IT APPLIES TO TRADE IN EDUCATIONAL SERVICES	30
C. THE SITUATION OF THE FIVE LARGEST SOUTH ASIAN COUNTRIES	31
VII. CONCLUSIONS AND POLICY RECOMMENDATIONS FOR HIGHER EDUCATION .	34
A. SUMMARY AND CONCLUSIONS ON HIGHER EDUCATION IN SOUTH ASIA	34
B. THE OPPORTUNITIES FOR REGIONAL COLLABORATION IN HIGHER EDUCATION	36
VIII. EDUCATION AND THE DEVELOPMENT STRATEGIES OF INDIA AND CHINA	38
A. EDUCATION IN INDIA AND CHINA.....	38
B. EDUCATION AND THE DEVELOPMENT STRATEGIES OF INDIA AND CHINA	40
IX. THE BROADER CHALLENGE OF POPULATION, EDUCATION, AND GROWTH IN SOUTH ASIA	43
A. POPULATION EDUCATION AND GROWTH	43
B. POPULATION EDUCATION PYRAMIDS.....	45
C. MOVING FORWARD.....	46
ANNEX A. A.T. KEARNEY LOCATION INDEX	49

REFERENCES	51
7. SOUTH ASIAN TELECOMMUNICATIONS DEVELOPMENT AND THE ROLE OF REGIONAL COOPERATION	55
A. INTRODUCTION	55
B. OVERVIEW OF THE SOUTH ASIAN TELECOMMUNICATIONS MARKET	57
C. COUNTRY-LEVEL MARKET ANALYSIS	61
D. THE ROLE OF COOPERATION	70
E. REGIONAL TELECOMMUNICATIONS COOPERATION: POTENTIAL BENEFITS AND BARRIERS	70
F. EVIDENCE FROM OTHER COOPERATIVE VENTURES	71
G. EXISTING AVENUES OF COOPERATION: BILATERAL AGREEMENTS, SAARC, AND SASEC	72
H. SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION: LOTS OF TALK, LITTLE PROGRESS	73
I. SOUTH ASIA SUBREGIONAL ECONOMIC COOPERATION	75
J. CONCLUSION	78
REFERENCES	79
8. AIR TRANSPORT LIBERALIZATION IN SOUTH ASIA: IMPACTS ON AIRLINE PERFORMANCE, LOGISTICS PERFORMANCE, INTERNATIONAL TRAFFIC FLOWS AND TOURISM	83
A. INTRODUCTION	83
B. AIR TRANSPORT ACTIVITY	84
C. CIVIL AVIATION POLICY REVIEW	87
D. IMPACT OF THE POLICY	101
E. REFORM PATHS AND IMPACTS	104
F. REGIONAL GROUPINGS	104
G. PRINCIPLES AND COMPLEMENTARY MEASURES	107
H. CONCLUSION	109
ANNEX A: TRAFFIC AND AIRCRAFT MOVEMENTS IN MAJOR SOUTH ASIAN AIRPORTS	110
ANNEX B: AIR INDIA AND INDIAN AIRLINES	113
ANNEX C: ONLINE FARES (LOWEST ECONOMY CLASS) FROM MAJOR SOUTH ASIAN CITIES TO EUROPE, NORTH AMERICA, THE MIDDLE EAST, SOUTHEAST ASIA AND EAST ASIA ON 29/30 SEPTEMBER 2008	117
ANNEX D: ECONOMETRIC RESULTS ON TRAFFIC FLOWS	119

TABLES

TABLE 6.1: RISING TERTIARY ENROLLMENT RATES WORLD REGIONS AND SELECTED COUNTRIES 1986 TO 2006	12
TABLE 6.2: PUBLIC EDUCATION SPENDING AS A SHARE OF GDP (PERCENT)	13
TABLE 6.3: BASIC POPULATION AND EDUCATION STATISTICS* (2006 EXCEPT AS NOTED)	15
TABLE 6.4: TOTAL TERTIARY STUDENTS ENROLLED (IN THOUSANDS) AND FEMALE AND PRIVATE PERCENTAGES (2006)	17
TABLE 6.5: EXPENDITURE ON EDUCATION SELECTED REGIONS AND COUNTRIES*	19
TABLE 6.6: INTERNATIONAL FLOW OF MOBILE STUDENTS AT TERTIARY LEVEL 2006	30
TABLE 6.7: SUMMARY OF COMMITMENTS FOR EACH MODE, BY COUNTRY	32
TABLE 6.8: EDUCATION COMPARISON: CHINA AND INDIA	39
TABLE 6.9: BASIC POPULATION INDICATORS WORLD REGIONS AND SELECTED COUNTRIES 2006-2015	44
TABLE 7.1: BASIC ECONOMIC AND TELEPHONE INDICATORS BY COUNTRY, 2007	57
TABLE 7.2: URBANIZATION AND TELEPHONE/COMPUTER OWNERSHIP 2006	58
TABLE 7.3: BASIC INTERNET AND BROADBAND INDICATORS BY COUNTRY, 2007	59
TABLE 7.4: INFRASTRUCTURE BARRIERS IN SOUTH ASIA, 2005	59
TABLE 7.5: LEVEL OF TELECOMMUNICATIONS COMPETITION IN SOUTH ASIA	61
TABLE 7.6: KEY AGREEMENTS FROM MOST RECENT SAARC SUMMITS	77
TABLE 7.7: INTRA-SOUTH ASIA TRADE	78

TABLE 8.1: PASSENGER AND CARGO MOVEMENTS FOR INDIA, PAKISTAN AND SRI LANKA.....	84
TABLE 8.2: INTERNATIONAL TOURIST ARRIVALS	85
TABLE 8.3: DISTRIBUTION OF NON-STOP FLIGHTS FROM MAJOR AIRPORTS IN SOUTH ASIA.....	85
TABLE 8.4: COUNTRY AVIATION POLICY SUMMARIES	88

FIGURES

FIGURE 6.1: AVERAGE ANNUAL PERCENTAGE CHANGE IN AVERAGE WAGES BY TYPE OF SKILLS, 2003–06.....	18
FIGURE 6.2: POPULATION STRUCTURE AND ENROLLMENT RATES SELECTED COUNTRIES 2005	48
FIGURE 7.3: TELEPHONE SUBSCRIBER PER 100 INHABITANTS (WITH GDP PER CAPITA): 1999-2007.....	60
FIGURE 8.4: RESTRICTIVENESS INDICES FOR THE DOMESTIC MARKET IN PERIODS AROUND 2000 AND 2006	100
FIGURE 8.5: RESTRICTIVENESS INDICES FOR THE INTERNATIONAL MARKET IN PERIODS AROUND 2000 AND 2006.....	100
FIGURE 8.6: INDEX SCORES FACED BY FOREIGN FIRMS AND DOMESTIC FIRMS	101
FIGURE 8.7: LPI AND AIR TRANSPORT RESTRICTIVENESS INDEX VALUES IN DOMESTIC MARKETS	102
FIGURE 8.8: LPI AND AIR TRANSPORT RESTRICTIVENESS INDEX VALUES IN INTERNATIONAL MARKETS	103
FIGURE 8.9: AVERAGE GROWTH RATE (GEOMETRIC) OF INTERNATIONAL ARRIVALS (2000–2006) AND INTERNATIONAL MARKET RESTRICTIVENESS INDEX VALUES	103

BOXES

BOX 6.1: ICT-ENABLED SERVICE EXPORTS FROM INDIA	8
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6. EDUCATION AND GROWTH OF SERVICES

Carl J. Dahlman

I. SOUTH ASIAN SERVICE GROWTH AND EDUCATION

A. INTRODUCTION

6.1 Services have been the main source of growth in South Asia over the last 25 years.¹ This has been particularly marked in the case of India, which has had the highest rate of growth in South Asia, and spectacular growth of exports of information-enabled services based on a critical mass of highly educated workers. The average level of education of workers in the service sector in South Asian countries is higher than in industry or agriculture.² In addition, the fastest growing services have also been the most education intensive.³ This has led some to believe that there is new development model based on high skill service growth.

6.2 In the global economy, services now account for nearly 70 percent of gross domestic product (GDP)⁴ and that share generally rises with the level of GDP. Commercial service exports also have been growing faster than GDP. They have increased to nearly 19 percent of total merchandise and commercial service exports, and are growing faster than goods exports.⁵ The rapid rise in service exports is due to increasing liberalization of trade and advancements in information technology. Rapid improvements in information and telecommunications technologies (ICTs) are making it increasingly possible to trade any service that can be digitized and that does not require face to face contact.

6.3 As a result of these developments there has been what can be described as two unbundlings.⁶ The first has been the unbundling of production of physical goods to the lowest production platforms world wide. This has led to the outsourcing of manufacturing to many developing countries through global production and distribution chains. Components are produced in many different countries, sometimes assembled in yet other countries, and integrated into global distribution chains.⁷ The second has been the unbundling of tasks made possible by the rapid advances in ICTs. Any task that can

¹ See Ghani (2009), Chapter 1 of this volume.

² The average years of education in services, compared to industry, ranged from 10 percent higher in Sri Lanka to 52-53 percent higher in India and Pakistan (Bosworth and Martens (2009), Table 7).

³ See Bosworth and Maertens (2009), tables in Annex B which has details on the average level of educational attainment of workers in different service categories. .

⁴ Although it is 75 percent/76 percent for the UK and the US and a high of 91 percent for Hong Kong,

⁵ WDR 2008 with trade data for 2006.

⁶ See Baldwin (2006) for more details on the concept of the two unbundlings.

⁷ See Gill and Kharas (2007) for a good analysis of how East Asia has become a key player in these global production in distribution chains.

be codified and digitized can in principle be outsourced not only to another firm, but to a firm anywhere in the world that can be connected through information technology. This has led to a rapid increase in offshoring of services.⁸

6.4 South Asia's share in global goods exports in 2006, at 1.30 percent, is only slightly more than half its share of global GDP at 2.37 percent. In a sense, South Asia has not yet taken full advantage of the unbundling of physical production as China has in East Asia. China's share of global goods exports in 2006 was 8.02 percent, or about 50 percent higher than its share of global GDP of 5.49 percent. On the other hand, South Asia is participating actively in the unbundling of tasks, and has developed a comparative advantage in the export of commercial services. South Asia's share of world commercial service exports is 2.91 percent and 62.3 percent consists of information-enabled services.⁹ However, this is not yet a widespread phenomenon in South Asia, as 93 percent of South Asia's commercial service exports are from India, and 73.7 percent of India's exports are information-enabled services.¹⁰ The virtuous circle of higher education leading to the growth of high value information-enabled service exports feeding back to faster growth and more investment in higher education shows the potential that the populous South Asian region has in higher education based growth [see Box 6.1].

Box 6.0.1: ICT-Enabled Service Exports from India

The rise of ICT-enabled services from India has been covered in detail in many other studies. (See Pack and Saggi (2006), Gordon and Gupta (2006) and Dossani (in this volume). The focus here is on the link to tertiary education. Many elements played a role in the rise of India in this sector. To a large extent India was able to get into this business thanks to earlier investments in had made in high quality engineering education, particularly through the Indian Institutes of Technology (IITs) and to their English language ability. Indian engineers were already doing some off-shoring work when the Y2K crisis hit at the end of 1999. That boost in demand to help fix the Y2K problem in computer and program software was a great boost to Indian ICT exports. Another key factor was the diaspora of Indian engineers and managers in companies in Silicon Valley and other places that got their companies to source, first software services, and latter more general business from India. A large part of these services are being done by Indian engineers working for subsidiaries of US and other foreign companies in India. These companies have set up affiliates in India to take advantage of the lower cost of high-skilled labor. Thus the success of this sector is mostly due to the high quality engineering and management graduates in India. However the rapid rise in demand for skilled engineers and other higher education graduates led to rapidly rising wage rates because of supply and regulatory constraints. Many thought this would be a major problem for the continued growth of the IT-enabled industry and for high value service-based growth. However the private IT sector was able to address these constraints. This has created a virtuous circle through which the rise in demand for high level human resources has led to an increase supply. This excellent example of how the private sector can solve some of the supply problems will be developed in Section IV.

6.5 The contrast between India and China regarding the relative share of services versus merchandise products also extends to their economic structures. South Asian countries have a higher service sector share of GDP than would be expected at their level of development. This is particularly so for India whose share of GDP in 2006 at 55 percent is 6 percentage points above the norm for a country at its level of GDP per capita.

⁸ See Blinder (2007) for the argument that ICT-enabled services constitute a "third industrial revolution".

⁹ The category in World Bank (2008a) is actually computer, information, communications, and other commercial services.

¹⁰ World Bank (2008a).

The share of the service sector in China's GDP, at 40 percent, is 10 percent lower than expected at its level of GDP per capita. On the other hand, the share of manufacturing in India, at 16 percent, is just slightly above what would be expected at its level of development; while China's, at 33 percent, is 19 percentage points above what would be expected at its level of development.¹¹ This raises the question of what accounts for the difference in the development patterns of these two countries, as well as the sustainability of India's (and South Asia's) service-led growth.

6.6 This chapter focuses on the role of education in South Asia's service growth. There is a paradox in that South Asia (primarily India) has a comparative advantage in the export of high-skilled services, although its average educational level is low. On the other hand, China has a comparative advantage in the export of manufactured products although it has a higher educational level than South Asia.

6.7 First we focus on the role of higher education in South Asia's service growth. Higher education contributes to growth as an input into other economic activities. In the case of South Asia, higher education has been very important in the success of IT-enabled exports from India. Section II outlines nine global trends in higher education and relates them to the situation in South Asia, while Section III examines in more detail the situation of higher education in the five largest South Asian countries--Bangladesh, India, Pakistan, Nepal, and Sri Lanka. The role of the ICT industry in overcoming the supply and quality constraints in engineering education that threatened to choke its growth in India is discussed in Section IV. Section V explores distance education in South Asia, while Section VI outlines the state of trade in education services. Section VII summarizes the findings regarding higher education and makes some observations regarding fruitful areas for collaboration among South Asian countries in higher education.

6.8 Section VIII returns to the broader issue of the role of education in South Asia's service growth. It compares education in India with China, then examines the role of education in the different economic and export structures in the two countries, and draws some implications. Section IX looks broadly at the challenge of education for South Asia. It notes the importance of seeing higher education in the context of the population and education pyramid in the countries. It focuses on the need to improve education in order to leverage the advantage of South Asia's rapidly growing population, and identifies issues that warrant further attention.

B. EDUCATION AND GROWTH

6.9 There has been a large literature on the relationship between education (especially higher education) and growth. Better educated workers are generally more productive and may also raise the productivity of co-workers (see Hanushek and Woessmann 2007). Higher stocks of human capital facilitate investments in physical capital and enhance the development and diffusion of new technologies and raise output per worker (OECD 2005b) Studies indicate that an increase of one year of education raises the growth rate of

¹¹ Ghani, (Chapter 1 in this report, Table 1.2).

GDP by around one percentage point. Rising labor productivity accounted for at least half of GDP per capita growth in OECD countries from 1990 to 2000 (OECD 2005b). In addition, some evidence exists that training increases economic growth, by improving productivity in individual enterprises, and by positive externality endowments to the economy in general.

6.10 Studies for most OECD countries show a strong positive relationship between educational attainment and average earnings. Tertiary graduates earn more than upper and post secondary graduates. The earning differentials between tertiary graduates and upper secondary graduates are more pronounced than those between upper secondary and lower secondary or below, “suggesting that in many countries upper secondary forms a break point beyond which additional education attracts a particularly high premium” (OECD 2005b, p. 118). Variations across countries reflect the supply of persons with the different levels of education, the needs of the economies, the minimum wage legislation, and the power of unions. Internal rates of return to investments in education also generally show that investments in education are attractive.¹²

6.11 Looking beyond the OECD at global experience, Psacharopoulos and Patrinos (2004) have estimated the average social rate of return to education is 10.8 percent, while the average return to primary education is 18.9 percent. However the returns to higher education range from 9.7 percent to 17 percent depending on the specific conditions of the country in question and the degree of high skill shortages. In the last 15 years the returns to higher education have increased almost 2 percentage points, while those to secondary education have decreased by 2.0 percentage points (Psacharopoulos 2006). Also, the returns to higher education are generally higher than the returns to physical investment.

6.12 Higher skills and more education are very complementary to technological advance.¹³ As a result, education and skills are becoming more important in international competitiveness. People need education and new skills to use new technologies. To produce new knowledge, they need more specialized tertiary education. More educated people tend to adopt new technologies faster. MNCs make their location decisions partly based on the education and skills of the local workforces. Because of the acceleration in the creation and dissemination of knowledge, there is a need for people to learn a diverse range of new skills.¹⁴ Thus, countries need to invest more on education and developing

¹² Studies on OECD countries have differentiated between private, fiscal, and social rates of return. There is great variation across countries in the extent to which education is public or private, and in the marginal tax rates (the Nordic countries tend to provide more free public education, but they also generally have higher marginal tax rates). The private and social rates of return are generally higher than the risk-free real interest rate, indicating that investments in education are worthwhile. But returns on human capital accumulation are not risk free, as indicated by the wide dispersion of earnings among the better educated. So, some individuals contemplating investments in education may need a compensating risk premium, which may require policy intervention to alleviate the constraints (OECD 2005b).

¹³ See for example De Ferranti et al. (2002).

¹⁴ This has given rise to what Peter Drucker termed the “knowledge worker”. The knowledge worker is not just the PhD with very narrow and advanced education. S/he is the technician and the graduate of the junior college.

new skills. Despite very rapid increases in the supply of higher education in most countries of the world, the gap between the earnings of college graduates relative to that of persons who only finish secondary school has not narrowed. This is because higher order skills are necessary to make effective use of new technologies.

6.13 Tertiary education is increasingly critical for economic competitiveness and growth, especially as rapid advances in knowledge, technology and skills are becoming the key drivers for development. Evidence shows that the link between higher education and economic growth strengthens as the rate of technology change increases. Tertiary education has four key roles. First, and most well known, is training cadres of managers and other professionals who occupy positions of leadership and provide the high level knowledge base in the economy. Second, is expanding the local knowledge base by accessing foreign knowledge as well as by domestic research and development in universities.¹⁵ Third, is the dissemination of knowledge beyond education by interactions between firms and organizations and the rest of society through consultancy and advisory services, as well as national and regional development projects.¹⁶ Fourth, is the maintenance of knowledge (the intergenerational storage and transmission of knowledge).¹⁷

6.14 In this chapter, we focus on the first function. However, the other three functions are also very important for growth and competitiveness in our increasingly knowledge-based world. Further analysis of tertiary education with respect to the other functions should be undertaken as South Asia also needs to improve its performance in those areas.

II. THE STATE OF HIGHER EDUCATION IN SOUTH ASIA

A. GLOBAL TRENDS IN EDUCATION AND TRAINING¹⁸

6.15 There are nine global trends that should be considered when developing higher education strategies.

- ***Higher enrollment rates, especially in higher education.*** Enrollments, especially in higher education, increased across all regions of the world except South Asia (Table 6.1). South Asian countries doubled their enrollment rates between 1990 and 2000, but have not been able to increase them since then. China's higher education enrollment rates, on the other hand, increased by a factor of 11 times.

¹⁵ Universities in South Asian countries do very little R&D compared to universities in developed countries. For the case of India see Dutz (2007).

¹⁶ The tertiary education system in South Asia is also weak in this dimension compared to systems in developed countries because it tend to be very disengaged from the rest of the economy and society.

¹⁷ See OECD (2008) for a global review of these four roles of tertiary education.

¹⁸ The total global education and training market, at about \$2.3 trillion, is growing rapidly. In total spending about a third of the market is in the US, only 15 percent in developing countries. In numbers, the large majority of persons studying or receiving training is in developing countries. In 2002, the total number of students in primary and secondary education worldwide was 1.2 billion, the total in higher education in 2002 was 100 million. In 2005 it was 137 million, with China responsible for more than 70 percent of the increase.

By 2005 it had more students at the tertiary level than the US, which until then had the largest number. In addition, 40 percent of them are in engineering, math and science so China is developing a very strong human capital base for its knowledge economy. In South Asia, students enrolled in engineering, math and science is much lower.

- ***Increasing demand for higher education graduates.*** The knowledge economy increasingly demands high skill levels, increasing the demand for tertiary graduates. The 1970s trend of declining rewards to higher education and falling rates of return to schooling reversed in the United States and other developed economies in the 1980s and 1990s. The gap in wages between educated and less educated workers widened significantly during the 1980s. They have also been widening in South Asian countries as seen below.

Table 6.1: Rising Tertiary Enrollment Rates World Regions and Selected Countries 1986 to 2006

	1980	1990	2000	2006
EAP	4	5	14	20
China	2	3	13	22
ECA	31	34	48	51
LAC	14	17	23	30
MNA	11	12	..	24
SA	5	5	10	9
Bangladesh	3	4	6	6
India	5	6	11	11
Nepal	3	5	5	6
Pakistan	..	3	..	5
Sri Lanka	3	5	..	..
SSA	1	3	..	5
High Income	36	47	61	67
World	13	16	24	24

Source: World Bank (2008a, 2004, 2002).

- ***Increasing private provision of education and training.*** Public education and training systems have not been able to respond to increasing demand for formal education and training. The share of tertiary spending from private sources has risen in many countries. Overall, the share of funds from private sources for tertiary education was 22 percent in 2002 (OECD 2005b), reflecting higher student tuitions in public tertiary institutions and the greater number of and enrollments in private tertiary institutions. Due to limited public resources for education and training, the Chinese government started charging tuition for students in public universities. These tuitions now cover 30 to 40 percent of the cost of public tertiary education. In addition, more than four million students are enrolled in private tertiary institutions (Dahlman, Zeng and Wang 2007). While there are no fully comparable statistics, the trend of increasing private provision is also occurring in South Asia (see country specific discussions in Section III and Table 6.4).

Table 6.2: Public education spending as a share of GDP (percent)

	1980	2006
Low Income	3.2	na
India	3.0	3.8
Lower Middle Income	4.0	4.1
China	2.5	Na
Upper Middle Income	4.0	4.1
Mexico	4.7	5.4
High Income	5.6	5.4
United States	6.7	5.6
World (median)	3.9	4.6

Source: World Bank (2008a and WDI 2000).

- **Increasing competition in provision of education and training.** New entrants in the provision of education and training have emerged, including publishers, the education and training arms of manufacturing or producing firms, and new information and communications based providers, many from abroad. This trend is echoed in South Asia.
- **Internationalization of higher education and training.** International student enrollments are increasing, particularly in higher education. In 1975 there were 0.6 million tertiary level students studying outside their home countries. By 2006, the figure stood at 2.8 million students (UNESCO 2008). China accounts for 15.2 percent of the tertiary students studying outside their home country, followed by India (5.1 percent) the Republic of Korea (3.7 percent), Germany (2.5 percent), and Japan (2.2 percent).¹⁹ There also are more faculty and student exchanges. Internationalization has also increased the number of institutional relationships and alliances across countries, many of them leading to commercial initiatives by public and private providers-- setting up schools, university campuses, and training facilities in foreign countries-- and providing education and training through distance learning technologies, including the Internet. The European Union has been developing a credit transfer system for both university and vocational education degrees (The Bologna Process). There are also efforts to develop international qualifications, quality assurance and certification systems to provide greater information on the skills required for different jobs, greater portability of qualifications, as well as greater consumer protection from low quality provision and qualifications. South Asian countries will have to develop a good strategy and enter international agreements to take advantage of the internationalization of higher education.
- **Older students in higher education.** In the more developed countries there is a marked trend toward older students in higher education. In 2004, in the US more than 5.9 million (39 percent) of higher education students were above the age of

¹⁹ The largest host countries are the US (584,814) the UK (330,078), Germany (259,797), France (247,510), and Australia (207,264). Australia and the UK are making education a major export business, with net tertiary (domestic students studying abroad minus foreign studies studying in country) accounting for 19.0 percent and 13.0 percent of their total tertiary enrollments, respectively.

24, this is projected to reach 6.9 million in 2012. In Canada 30 percent of undergraduates were over 25 years old. In Australia, New Zealand, Denmark, and Sweden more than 20 percent of first-year university students were over 27 in 2000 (Perkinson 2005). Many are getting work experience before returning to higher education, others return to obtain or upgrade specialized skills needed to improve their job prospects or productivity. The knowledge economy increases demands for adults of all ages to keep up with rapidly changing new technologies, adding to already expanding demand for higher education. Although the data on this for South Asia is incomplete, it appears to be following the same global trend.

- ***More participation of workers in continuing education.*** Most workers require supplementary skills to remain competitive in their current jobs. This makes continuing education indispensable in maintaining professional qualifications and employability in an ever-changing job market. In Denmark, Finland, Sweden, and Switzerland around half the labor force participated in some form of nonformal, job-related continuing education and training within the 12 months before a 2003 survey, this figure rises to more than two-thirds if informal training is added. Training is more common in large firms, the public sector, and services. It is also more usual for full-time workers, increasing in line with initial level of qualifications (OECD 2005b). In South Asia as a region there is much lower prevalence of firm-based training. However, some of the leading firms, particularly those in the skill-intensive ICT industry conduct extensive internal training programs. In firms such as Infosys and Wipro in India, at any given time up to one-third of workers are taking some type of training to maintain skill levels.
- ***More use of information and communications technologies (ICTs) in formal and continuing education.*** In some countries the move toward distance learning technologies was initiated by governments to reduce costs and extend coverage to masses of students. This is the case for the Radio and TV University in China, the UK Open University, and Indira Gandhi National Open University (IGNOU) in India. As ICTs become accessible and affordable, more countries are taking advantage of these new technologies to deliver education and training efficiently and flexibly.²⁰ This trend is also occurring in South Asian countries.
- ***Growing need for training in ICT skills.*** ICT skills are becoming core skills, along with reading, writing and arithmetic. The use of computers at an early age helps students to learn ICT skills, which can then be used in the education process. Significant “learning effects” occur with experience using ICTs, and productivity gains increase with training. Developing countries need to build these skills into its formal educational curriculum at all levels. They also have to expand the provision of these skills for persons who have already left the formal educational system. In South Asia a very dynamic market exists in this area, as the success of the ICT-enabled service industry has spawned the creation of an

²⁰ In the United States there were 1.9 million higher education distance students in 2003, 2.6 million in 2004, about 40 percent of them fully online (Perkinson 2005). Some estimate that the online-e-learning sector will become a global \$150 billion+ industry by 2025.

active ICT training market. One of the best known examples is NIIT. NIIT created in 1981 to provide training for the IT industry in India. Now a global corporation with operations in 40 countries, it has been contracted by several provincial governments in India to provide ICT training to high school students (Dahlman and Utz 2005).

B. HIGHER EDUCATION IN SOUTH ASIAN COUNTRIES

6.16 South Asian economies are very diverse, ranging in size from Bhutan and the Maldives with populations of less than one million; to the small economies of Nepal and Sri Lanka with populations between 20 and 30 million; to the large economies of Bangladesh and Pakistan with populations of about 160 million, to the giant of India, with a population of 1.1 billion. This chapter provides some detail on all but the two smallest. Even within the remaining five there are wide differences on many aspects. In per capita income—they range from a low of \$320 in Nepal, to high of \$1,310 in Sri Lanka. This variance is paralleled in the average number of years in education which ranges from 2.43 years in Nepal to 6.87 years in Sri Lanka. They also differ in other education indicators including literacy, primary enrollment rates and completion; and secondary and tertiary enrollment rates (Table 6.3).

Table 6.3: Basic Population and Education Statistics* (2006 except as noted)

	Bangladesh	India	Nepal	Pakistan	Sri Lanka
Gross National Income/capita	450	820	320	800	1,310
Population (millions)	156	1110	28	159	20
Av. Pop. Growth rate 1900-2006	2.0	1.7	2.3	2.4	1.0
Av. Pop Growth rate 2006-2015	1.6	1.2	1.7	2.1	0.3
Literacy Male/Female	54/41	73/48	63/35	64/35	92/89
Primary Net Enrollment Rate	89	90	79	66	97
Primary Cohort Survival Rate(% of children in 1st grade that reach 5 th) Male/Female 2005	63/67	73/73	75/83	68/72	../..
% last year primary enrollment entering secondary Male/Female 2005	86/92	87/83	79/74	69/75	../..
Secondary Gross ER	44	54	43	30	87
Tertiary Gross ER	6	11	6	5	..
Average Yrs Educational Attainment of Adults (2000)	2.58	5.06	2.43	3.88	6.87

Source: World Bank (2008a and 2008b).

6.17 Besides having a generally low position on all average educational indicators, South Asia has a poor relative position in tertiary enrollment rates with a weighted average of 10 percent; and a large dispersion from just 5 percent (Pakistan), to a high of 11 percent (India) versus 20 percent for East Asia (where China is currently 22 percent). Given its much larger population and higher enrollment rates, total enrollments in India are 12.9 million. These are 12 times those of the second largest; Bangladesh, with 1.1 million; followed by Pakistan, with 0.9 million (Table 6.4). Globally, India has the third largest highest tertiary education enrollments in the world; after China, with 23.4 million; and the US with 17.5 million. The South Asia region, with 14 million higher education students, has the critical mass to have a world class higher education system as is developed below.

C. THE DEMAND FOR HIGHER EDUCATION IN SOUTH ASIA

6.18 Since higher education is widely seen as means to better job, in South Asia, as in the rest of the world, there has been an explosion of demand. Excess demand for education can be seen from three factors. The first is the rapid proliferation of private higher education institutions in all the countries, but is most evident in India. In Bangladesh 47 percent of the students are in private higher education institution, in Pakistan just 8 percent (Table 6.4).²¹

6.19 A second indicator is that many students who do not get into higher education in their native countries opt to study abroad. They represent anywhere from 1 percent to 6 percent of the tertiary students in the home country (see Section VI and Table 6.8).

6.20 A third indicator of the strong demand for education in the region can be seen from the rates of return to education.²² For the three countries for which there is time series data, the returns to education have increased over time, particularly for higher secondary and tertiary education. The rates of return are especially high for females at the middle, secondary, and higher secondary levels. The returns also tend to be higher for India and Pakistan (which are countries with faster and more continuous economic growth), than for Sri Lanka where growth has been more variable. The returns to males are the highest in India with rates of 15 percent. These higher returns clearly indicate that the demand for educated and skilled workers has been increasing faster than the supply. This is consistent with evidence from other countries.

6.21 In addition, there are differences in the return to education by sector. Riboud, Savchenko and Tan (2007) find that in India the rates of return to secondary education first increased but then fell for all but utilities and construction, which was the highest throughout. For tertiary education the rates of return increased for all sectors over the 20 year period, despite a dip in 1999. Business services had the highest returns among all the sectors. By 2004, the last year covered, they increased had from 12 percent in 1989 to 18 percent, consistent with the well publicized growth in demand for ICT-enabled services.

²¹ Percentages from private institutions are from UNESCO (2007). More detailed country information follows below.

²² Riboud, Savchenko, and Tan (2007) calculate the rates of return to education based on wage equations derived from household surveys in the respective countries.

Table 6.4: Total Tertiary Students Enrolled (in thousands) and Female and Private Percentages (2006)

	Total Enrollment	% Female	% Private
World	143,889	50	...
Arab States	7,038	49	...
Central and Eastern Europe	20,125	55	...
Russian Fed.	9,167	57	12
Central Asia	1,974	52	...
Ukraine	2,819	54	...
East Asia and Pacific	43,777	47	...
China	23,361	47	...
Indonesia	3,657	..	...
Japan	4,085	46	80
Republic of Korea	3,204	37	80
Thailand	2,504	54	17
Latin America and Caribbean	16,247	54	...
Brazil	4,572	56	72
North America and Western Europe	33,752	56	...
USA	17,487	57	26
South and West Asia*	17,253	41	...
Afghanistan	28	20	...
Bangladesh	1,054	35	49
Bhutan	4	33	...
India	12,853	40	...
Iran	2,829	52	52
Nepal	147	28	...
Pakistan	955	45	33
Sri Lanka	...	...	...
Sub Saharan Africa	3,723	40	...

* UNESCO groups Iran in this regional aggregate.

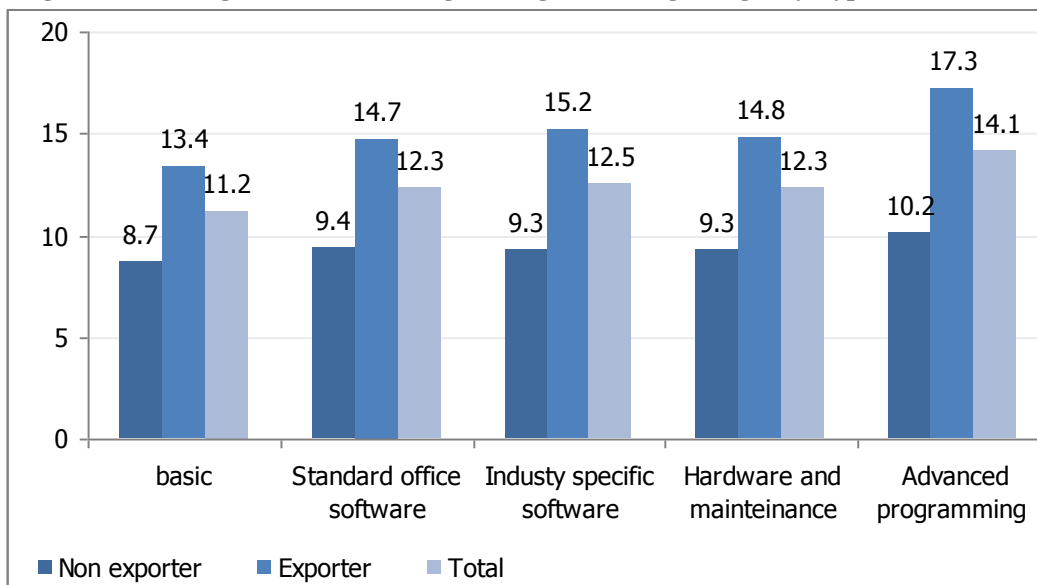
Source: UNESCO (2008, Table 8); De Ferranti et al. (2003)

6.22 In Pakistan, rates of return to secondary education were highest for business services and manufacturing rising throughout the period. The returns to public administration fell throughout the period, and were the lowest among all the sectors by 2004. The returns to utilities and construction and whole and retail trade rose, but only slightly. However, for higher education, the returns to utilities and construction and public administration rose to become the two highest categories. Those for business services and manufacturing fell. This may have been related to the greater variability in Pakistan's growth rate.

6.23 In Sri Lanka, for secondary education there was a dramatic fall in the returns to business services and public administration since the mid-period. The other three did not change much, although returns to manufacturing did dip in the mid period. For higher education there was not that much variability in the returns. Also there was not much difference in the returns, except for public administration which were much lower.

6.24 Noticeably only India shows rising returns to business services in tertiary education and these are higher than for the other sectors, suggesting that this was linked to the rapid demand for ITES-enabled services. This is consistent with a micro data indicator of excess demand for ICT skills in India from the World Bank Investment Climate surveys (Figure 6.1). It shows that average wages have been rising faster for higher levels skills, and that the increase is larger for firms that export (and presumably have to perform to higher quality standards) than for firms that do not export.

Figure 6.1: Average Annual Percentage Change in Average Wages by Type of Skills, 2003–06



Source: India ICA report based on : Software/ITES ICS 2006.

6.25 It is also noteworthy that the level of education tends to be higher for the services sector. Bosworth and Maertens (Chapter 2 in this report) found that the average educational attainment increases in South Asian countries from agriculture to industry to services. Higher rates for industry than agriculture are expected, but the higher levels for services is somewhat surprising, traditional service employment is low skill employment. However, the high-skilled part of services, such as business services and finance, showed the fastest growth. In India and Pakistan the average years of education in services was more than 50 percent higher than that in industry. In Nepal and Sri Lanka the average years in services were just 10 percent higher than in industry.

D. THE SUPPLY OF HIGHER EDUCATION

6.26 There has been an expansion in the supply of public tertiary education in South Asia, however, it has not kept pace with demand. Supply has been constrained by the generally weak fiscal position of the countries as well as by regulatory barriers and biases against private sector supply. South Asia has the lowest share of public expenditure on public education, less than half the average share in the world as a whole, and just 40 percent of the share spent by high income countries (Table 6.5). India has the highest share of public expenditure on public education among the South Asia region, but it is still almost one percentage points below the global average.

6.27 Another constraint on the growth of public higher education is the fact that tertiary education costs more per student than secondary and primary education. This is the case globally, but it is particularly so in South Asia (Table 6.5). In 1999, for example, in Nepal the average per pupil cost of higher education was ten times that of secondary education, and in Bangladesh and India it was four times the cost of secondary education. Furthermore, there are many pressing needs on limited government budgets, not only to extend access to basic and secondary education to a larger proportion of the population, but also for many other government services such as preventive health, infrastructure, and other public goods.

Table 6.5: Expenditure on Education Selected Regions and Countries*

	Public Expenditures Per Student as % of GDP/Capita						Public Expenditure on Education
	Primary		Secondary		Tertiary		% GDP
	1991	2006	1999	2006	1999	2006	2006
EAP	7.0	..	32.2	..	3.5
China	11.5	..	90.1	..	
ECA	..	13.6	..	18.2	..	21.8	4.2
LAC	..	11.4	14.8	14.1	37.1	..	4.0
MNA
SA	13.1	..	90.8	..	2.2
Bangladesh	..	7.6	12.4	14.6	46.3	49.4	2.5
India	..	9.2	24.9	27.0	90.8	61.0	3.8
Nepal	13.1	..	141.7	..	..
Pakistan	2.6
Sri-Lanka
SSA	..	11.8	..	..	..	..	4.2
High Income	15.8	19.2	24.3	24.8	32.8	29.0	5.4
World		14.5	..	21.1	..	..	4.6

Note: Regional data are means, not weighed averages.

Source: World Bank (2008a).

III. THE SITUATION OF HIGHER EDUCATION IN THE FIVE LARGEST SOUTH ASIAN COUNTRIES

6.28 The higher education systems have been under pressure in all the countries as they strive to cope with increasing demand. A synopsis of the situation is presented below for each of the five countries, with some additional quantitative information in Table 6.7.²³

A. BANGLADESH

6.29 There are two categories of higher education institutions—degree awarding universities, and colleges affiliated to the National University (NU). The higher education

²³ This section draws heavily on a series of summary tables on the higher education sector of the three countries prepared by the World Bank Education Sector. See World Bank (2008d) for details on enrolment from each country.

sector in Bangladesh has recently undergone an expansion. At independence in 1971 there were only 4 public universities, now there are 29. However, excess demand in the 1990s saw the rapid growth of private universities. Currently there are 54 private universities, mostly around Dhaka and other large cities. There are also 1400 colleges affiliated to the National University which serves about 80 percent of the student body.

6.30 The University Grants Commission (UGC) is responsible for funding public universities and approving private universities. The colleges are controlled by the NU. There is no effective quality assurance mechanism. Each university establishes its own mechanism, but do not provide results for external review. The UGC is supposed to monitor the private universities since it approves their operation. However, most private universities have failed to meet minimum requirements regarding infrastructure, full time faculty, libraries, and other facilities. The government recently developed a National Strategic Plan for Higher Education for the next 20 years which is supported by a World Bank loan.

B. INDIA

6.31 India has the largest and most developed system of higher education in South Asia. There are four types of institutions—Universities (established by an Act of Parliament or of a State Legislature), Deemed Universities (institutions which have been accorded the status of a university with authority to grant their own degree through central government notification), Institutes of National Importance (such as the Indian Institutes of Technology which are institutions awarded that status by an Act of Parliament), and colleges affiliated to universities (which may be aided or not aided by the government or the state and which have to follow the curriculum dictated by the affiliated University). The system has been growing rapidly in the last ten years, particularly private institutions. In 2005/6 enrollment in private and unaided institutions was estimated to be 31 percent of total enrollments.

6.32 The University Grants Commission (UGC) allocates public resources to the universities and colleges (including the so-called “aided” private colleges) and recognizes colleges (which is a prerequisite to receive public funds). Quality assurance is done primarily by the National Assessment and Accreditation Council (NAAC) established by the UGC, although there are other institutions for technical colleges and professional schools. However, this is relatively new and only a small proportion of institutions have been accredited. A burning issue in India is that of equity. As part of an affirmative action program the number of places reserved for the lower castes and scheduled tribes was raised to 50 percent, sparking a widespread public debate. As part of the 11th Development Plan, the federal government announced that it proposes to raise enrollment rates from 10 to 15 percent. This includes creating 30 new Central Universities, 8 new Indian Institutes of Technology, 20 new Indian Institutes of Information Technology, 7 new Indian Institutes of Management, several high grade Medical Institutes, and one degree college in each district in the country.

C. NEPAL

6.33 The first university in Nepal (Tribhuvan University-TU) was established in 1958. In 1971 all community colleges were nationalized and became part of TU. Currently there are 6 universities and 567 colleges. TU has 91 percent of the students. It appears that 9 percent of total enrollments are in private institutions.

6.34 The Ministry of Education and Sports is responsible for the education sector, but the University Grants Commission (which funds and monitors higher education) is under the Ministry of Health. A Quality Assurance and Accreditation Council has been established in the UGC. The government has been preparing a 20 year strategic vision for the higher education sector.

D. PAKISTAN

6.35 There are two types of higher education institutions—the university/degree awarding institutes (DAIs) and the affiliated colleges sector. The UGC has recently been replaced by a Higher Education Commission (HEC) and is responsible for public funding and accrediting degree programs. Although almost half the 120 universities and one-third of the 1135 colleges are private, the education sector is mainly public; 75 percent of university students, and 91 percent of college students are in the public system. (This does not take into account the large number in the distance education program.)

6.36 Although Pakistan’s higher education system was neglected for two decades, in the early 2000s the government increased funding and created the HEC to implement major reform outlined in the 2005 to 2010 Medium-Term Development Framework. This sought to improve, access, quality and governance. Enrollment grew significantly and there were improvements to procedures and greater focus on quality and merit. However, much still remains to be done.

E. SRI LANKA

6.37 There is no reliable information on enrollments in Sri Lanka’s higher education sector, other than for the public sector. There are 17 public universities with about 70,000 students. This gives an enrollment ratio of just 3 percent. However, there is also an open university, 13 post graduate and specialized institutes and an estimated 150,000 “external students” who take exams without attending classes. There are more than 50 private higher education institutions, and their numbers continue to grow. Adding all students in this broader system gives an enrollment rate of about 18 percent and rising. Greatest growth has been in the private system, accounting for nearly 7 percent of total tertiary students (counting distance education and “external students”). Until 2006, higher education was under the Ministry of Education, but in January 2007 a Ministry of Higher Education was created as greater importance was given to the sector

6.38 Higher education in Sri Lanka used to be highly regarded, but it has not maintained this reputation as the system expanded. Student assessment reflected low quality and employers’ assessments were negative. The UGC has initiated stronger steps to improve quality assurance, but this excludes private HEIs. A move towards an

independent accreditation board is being considered. The government launched a 10 year Horizon Development Framework (2006-2016) to create a knowledge economy with higher education as one of the main pillars.

6.39 Besides the weak performance of South Asian countries on formal higher education, the countries in the region do not do compare well in post-school or in-service training by employers. An analysis based on labor force surveys found that the incidence of post-school training was low in South Asia. It was lowest in Pakistan with just 2.4 percent, and highest in Sri Lanka with 12 percent. The returns to post school training were positive and statistically significant, even when controlled for educational attainment and other worker attributes (Riboud, Savchenko and Tan 2007, ch 5). In addition, based on cross country investment climate surveys, it was found that the incidence of in-service training in South Asia is among the lowest in the world, less than half the average for East Asia, Europe and Central Asia, and Latin America and the Caribbean. Since such training is required for technological change and productivity growth, the low incidence of training has negative implications for the competitiveness of the region's countries (Riboud, Savchenko and Tan 2007, ch 6).

F. COMMON CHALLENGES, DIFFERING APPROACHES

6.40 Essentially the same generic issues arise, to different degrees, across all five countries. They are access, quality, relevance, finance and governance. Moreover, they are all related to the increasing demand for higher education across all the countries, which is part of the global trend in education and competitiveness outlined above. In addition, there are strong interrelationships among most of these issues.

6.41 **Access.** As has been seen, all the countries are struggling to deal with the problem of increasing access. The public system has not been able to respond to increasing demand, let alone extend access on an equitable basis. As a result, the private sector has jumped in to respond to unmet demand. While that has helped address part of the problem, it has created other problems, including those of equity and quality. In addition, as was seen in Table 6.1, even with the entry of the private sector, the South Asia region is not increasing tertiary enrollment as fast of other developing areas, particularly East Asia, and especially China.

6.42 **Quality.** Concerns about the quality of higher education stem from three causes. One is that there is great variation in the graduates of both the public and private systems. Most countries have some very good first tier public universities. However, they also have a much larger tier of universities and colleges that produce very poorly prepared students. Similarly, there are some excellent private universities. However, there are also a very large number of diploma mills that have emerged to take advantage of the excess demand. The second cause is that none of the countries have effective systems of quality assurance, either for the public or the private sector. The third is that it is hard to maintain quality when systems go through significant expansions, as is the case in some of the countries. Compounding this problem is a shortage of qualified faculty in all the countries. That arises, in part, because faculties are generally not well compensated. This

is a particularly severe problem for good faculty in high-demand programs, such as information technology and other hot fields. The public universities simply cannot compete with career opportunities in the business world to retain their faculty or to staff expansions. In addition, salaries for faculty even in the private higher education sector are often controlled by the government (as in the case of India) generalizing the problem to the private higher education sector.

6.43 **Relevance** There are various indications of lack of relevance in the output of higher education. In many countries too many tertiary graduates are produced in fields for which there is limited demand, while not enough are produced in areas in higher demand. This is caused by rigidities in the number of places allocated to different disciplines in the public system. Another part of the problem is due to outdated curriculum and pedagogical methods that still rely too much on rote learning rather than creative thinking, problem solving and team work that is needed by the market. A study by the McKinsey Global Institute based on interviews with multinational companies, for example, found that only one quarter of Indian engineering graduates were considered to be qualified to be hired by the companies.²⁴

6.44 **Finance** Much of the problem of access and some of the problems of quality and relevance stem in large part because of limited finance. However, much can, and should, still be done to improve efficiency of public higher education, including the use of distance education and computer based learning. Another strategy is to charge tuitions to help offset public cost of expanding access, as has been done in China. It can be argued that since graduates are likely to get better paying jobs, they should be able to finance it through their higher earning potential. Another solution is to let the private sector grow further to service a larger part of the growing market. However, shifting the financial costs to the students by increasing tuitions in the public system or pushing them off into a private system increases the problem of equity. Increasing the private costs of higher education makes it more difficult for poor and disadvantaged students to access the better job and income opportunities associated with increased education. Therefore, governments will have to focus more on addressing the equity problem through grants and other support schemes for qualified students who cannot afford the increasing cost of higher education. In addition, they will have to do more to develop a student loan market as is being done in India.

6.45 **Governance.** As noted, the formal higher education system in all five countries now has both public and private higher education providers. There are also many more providers of post secondary education and training services including specialized certificates in everything ranging from certain software certification to professional qualification certificates in accounting, legal, financial, or other services. As the system becomes more complex with multiple players and multiple pathways, new and better systems of governance have to be established. The public sector has to improve

²⁴ Farrell et al (2005 p. 96) based on interviews carried out by McKinsey, estimated that on average only 25 percent of the engineering graduates in India were suitable for employment by multinational companies. Problems were language skills, too much emphasis on theory rather than practice, and lack of cultural fit (interpersonal skills as well as attitudes towards teamwork and flexible work).

governance arrangements for the public institutions under its direct control by developing better incentive, monitoring, performance assessment, and accountability both for the internal processes of the education process, as well as for students. However, it also has to help set up systems and processes to improve the performance of the broader post secondary system, including better quality assurance mechanisms as well as better information on career prospects and on the quality of different education providers. Thus its role needs to change from the earlier paradigm where it was the sole provider of higher education, to one where it is just one of the providers in a more complex system with multiple providers and many more pathways to higher education skills and degrees.

6.46 As can be inferred from the quick overview of the situation in the different countries, they have tried different degrees of privatization as well as of liberalization or regulation of their higher education sector and they have had mixed results. The mixed results are due not only to the different approaches, but also to how vigorously and effectively they have implemented them. While there are different ideologies on the role of government and of the market, it is interesting and quite instructive to briefly review the spectacular rise of the IT- enabled service exports from India. We outline what was done by the private sector to overcome many of the challenges enumerated above, and what challenges were compounded by a fairly unresponsive public education sector.

IV. TACKLING THE CHALLENGES: THE EXAMPLE OF THE ICT SECTOR IN INDIA

6.47 The rise of the information technology/ information technology-enabled service (IT/ITES) sector in India is a remarkable example of development. It also illustrates the power of market demand and of a strong private sector in bringing about fundamental reform in the higher educational system. The growth and contribution of the sector to the Indian economy can be traced through various figures. These include its direct contribution to GDP, its export earnings, direct and indirect employment generation, its multiplier effects, and other indirect effects on the rest of the Indian economy.²⁵

6.48 The share of the IT/ITES industry to GDP has risen rapidly from just 1.2 percent in FY 1998 to 5.2 percent in FY 2007. Exports have increased from USD \$1.8 billion to 40 billion over the same period. Direct employment has risen from 190,000 to 2,000,000. Although this was just 0.5 percent of India's labor force, it made the sector the largest employer in the organized private sector in the country.²⁶ NASSCOM states that studies show that for every job created by the IT/ITES industry three to four additional jobs are created in the rest of the economy. These include direct service providers such as

²⁵ This section draws heavily on a recently completed study by NASSCOM with the assistance of the consultancy and accounting firm of Deloitte. It was based on the data base and studies done by NASSCOM and others, a survey of 123 member firms, and direct interviews with firms and government officials. See NASSCOM Deloitte (2008).

²⁶ The Indian labor force is about 400 million, but only 11 percent work in the organized sector (roughly equivalent to the formal sector consisting of firms employing 10 workers or more and paying regular wages). However, roughly two-thirds of workers in the formal sector work for federal, state, or local government, so formal private sector employment is roughly just 3.5 percent of total employment.

catering, transport, housekeeping, security; and spending on housing, infrastructure, food, clothing, entertainment, travel etc. Thus the sector is estimated to provide s indirect employment for another 6.5 million workers (most of which do not require higher education). NASSCOM also estimates that spending USD \$15.83.billion in FY 06 by the IT/ITES sector has an output multiplier of two on domestically sourced goods driven by firm outlays on domestic capital and operating expenditure, and consumption expenditure by its professionals generating an additional output of USD \$15.5 billion through direct and indirect backward linkages with other sectors and induced effects of wages and salaries.²⁷

6.49 Another indirect effect of the rise of the IT/ITES industry includes fuelling the growth of the venture capital and private equity funding industries in India (the IT and ITES sectors accounted for more two-thirds of the deals by 2000) and spurring the growth of first generation entrepreneurs.²⁸ But perhaps the most important indirect contribution of the success of the Indian IT/ITES industry has been to boost the confidence of Indian entrepreneurs and to raise the image of India on global markets. The industry has definitely put India on the global map and led to increased foreign investment by MNCs seeking to benefit both from the skilled higher education graduates that have been the driving factor behind the growth of this sector, plus the now rapidly growing domestic market.

6.50 The main motivation for firms to offshore services internationally is the lower cost of foreign knowledge workers. However, low wages for professionals in the information industry and other business services is not the only element taken into consideration. Firms also give weight to other costs including information infrastructure, the supply of skills and the general business environment. In the 2007 global ranking of the top 50 countries as evaluated by AT Kearney, which includes these four factors, India is rated the most attractive overall. Particularly noteworthy is the high score it receives on people and skills availability.²⁹ (Annex A)

6.51 India's reputation for world quality human capital has attracted much foreign investment into India to capitalize on this valuable resource. Apart from setting up subsidiaries in India to do business process outsourcing (BPO) and information and computer related services, firms have also hired Indian graduates to do research, consulting and investment analysis and other knowledge-intensive services for both their domestic and global operations. In addition, there have been spillover effects and impressive gains in other knowledge-intensive production and service sectors such as pharmaceuticals, biotechnology, auto parts, etc. Thus there has been a more general boom in knowledge-intensive activities in the Indian economy.

²⁷ NASSCOM Deloitte (2008).

²⁸ These included Narayana Murthi who started Infosys with initial capital of USD \$250 in 1981 but by FY 07 had 60,000 employees and turnover of 3.2 bln USD; Shiv Nadar and five other engineers, who launched Hindustan Computers Limited (HCL) in 1976 which launched its first computer in 1982, and is now India's second largest computer and office equipment manufacturer. (Nassom Deloitte 2008).

²⁹ McKinsey has also developed a local cost index which includes cost of labor, vendor landscape, domestic market, risk profile, business environment, and quality of infrastructure, with the weights attached to each varying depending on the nature of the service.

6.52 All this demand for knowledge workers has put tremendous pressure on supply. In addition, the poor quality of the bulk of the graduates of the higher education system soon became obvious. Companies that hire offshore talent, tend to follow each other so there is often clustering in particular locations. This can create excess demand and local wage inflation. Farrell et al. (2005, p. 99) estimates that salaries of engineers in hot cities in India could have doubled between 2005 and 2008.

6.53 Overall, the supply of high quality education has become a major preoccupation for the ITES industry. The 2005 NASSCOM McKenzie Study identified a shortage of qualified talent for the IT/ITES industry of 500,000 by 2010. Since the educational sector was not able to respond to the massive need, individual firms developed their own training programs. The top software companies, Infosys, Wipro, TCS, HCL Technologies, and Satyam were said to be spending USD \$430 million in 2007/2008 to train 100,000 engineers hired during this period. For most companies 80 percent of the hires are entry level and 80 percent of the budget is spent on these new entrants.³⁰

6.54 The industry association, NASSCOM also set up various initiatives targeting three levels of talent requirements.³¹ For the *entry level* it launched NASSCOM's Assessment of Competence in 2006 as an industry standard assessment and certification program to test the skills and capabilities of entry level manpower. It is working with universities and colleges to help align their curriculum with the needs of the ITES-BPO sector. It aims to reduce hiring costs, improve efficiency, enlarge the candidate pool and reduce escalating costs.

6.55 For the *middle level* it launched NAC-Tech, a similar testing and accreditation program for evaluating students seeking jobs in the technology engineering industries. It aims to help both students and higher education institutions understand the skills required by the industry. With the Ministry of Human Resources and Development, it also launched in 2007 a "Finishing Schools for Engineering Students Program" to raise the skills of graduates to the needs of the industry. The curriculum reinforces some basic engineering skills and provides industry specific knowledge and skills, soft skill, and management and employment skills. The program provides feedback on the ability of students in rational analytical thinking capabilities in a problem solving environment and includes the NAC-Tech test. It has also launched an IT Workforce Development Program aimed at improving the interaction between the industry and academia. It includes workshops on the needs of the industry, faculty training workshops and sabbaticals, a 12-24 month mentorship program with specific colleges and institutions to close the gaps in teaching methods and improve educational quality. It also works with formal academic bodies such as the Ministry of Human Resource Development (MHRD), the All India

³⁰ NASSCOM 2008. Some firms have also developed specific programs with institutes of higher education. The include: "Fellowship Program" from Infosys at top institutes for PhD work in computer sciences, management, law and accounting; "Campus Connect" program, also from Infosys, focused on aligning the needs of engineering colleges, faculty, and students with the needs of the industry; and the "Sarvodaya Program" of TCS with departments of Education and Science and Technology in various universities to help students upgrade technology and programming skills, enhance communication and presentation skills and many others.

³¹ This section is based on NASSCOM (2008).

Commission on Technical Education (AICTE), and the University Grants Commission (UGC) to improve and standardize curriculum and pedagogy. Finally it promotes research and white papers in key areas such as curriculum requirements and skill sets needed by the industry.

6.56 For the **top level** it is working with the MHRD to develop highly specialized professionals in “on the horizon” technologies that are not yet mainstream. This includes sectors ranging from banking, remote sensing, water, agriculture, energy, transportation, environment, geosphere, natural sciences, nanotechnology, health care, networks and mobile computing, image processing, cyber security, etc. The objectives include not only research, but the creation of competent professionals, and the incubation of new companies and clusters. This involves collaboration on the establishment of five new Institutes of Information Technology (IITS) based on the public-private partnership model by the end of 2008, with in MHZ’s plan to have 20 IITs during the current plan period.

6.57 This shows the tremendous impact that this strong and growing sector is having on the higher education system. Although there are limits to what can be done by the market, and there is surely an important role for government, it shows how the private sector has been able to improve the quality of engineering education by:

- Developing a *de facto* certification exam to test the competence of graduates;
- Working directly with universities to reform and update the curriculum;
- Training faculty in new technologies and pedagogies;
- Putting new entrants through a rigorous boot camp to improve standards.

6.58 While other industries have not been subjected to such strong shortages of quality students, and while the technology base in those industries may not be changing as fast, the case of the Indian ICT industry does illustrate the need to reform and update antiquated and dysfunctional systems. It also illustrates how these standards, pushed by industry are becoming *de facto* standards. Since students want to get jobs in this industry they are paying attention to how well the graduates of different programs do on these accreditations tests and using that to select where to study. At the same time universities and training institutions are taking note of the search for quality by students and are aiming to improve their quality of their programs. Furthermore, the government has responded to the demands of the market and the value that can be contributed by quality education by expanding the number of Indian Institutes of Technology, Indian Institutes of Management, Indian Institutes of Information Technology and other high quality higher education institutions.

V. THE POTENTIAL OF DISTANCE EDUCATION IN SOUTH ASIA³²

A. THE POTENTIAL

6.59 Given the large demand for tertiary education as well as the constraints on public budgets there is enormous potential for open and distance learning (ODL) education programs.³³ These programs have been given a strong boost from the rapid advances and falling costs of information and communication technologies. Their advantage of using ODL centers on the potential to provide a cost effective delivery of tertiary education, as well as life long learning opportunities to many different categories of students.

B. THE SITUATION IN SOUTH ASIAN COUNTRIES

6.60 There already are large, well established ODL programs in South Asian countries. India has the largest system. It includes nine tertiary institutions, dominated by the Indira Gandhi National Open University (IGNOU). Moreover India's Tenth Five Year Plan (2002-2007) aimed to expand ODL to reach 40 percent of all tertiary level students in ODL by 2007.³⁴ Pakistan has the Allama Iqbal Open University (AIOU) which is Asia's oldest single mode ODL tertiary institution. Sri Lanka has the Open University of Sri Lanka (OUSL). Bangladesh Open University (BOU) emerged from the National Institute for Education Media and Technology (NIEMT) which in turn has resulted from the fusion of a correspondence school and a school of broadcasting.

6.61 There is very incomplete information on the actual enrollments and graduates in these systems. In Bangladesh the BOU had more than 200,000 students in 2001 in program ranging from high school to certificate and tertiary degree programs. In India, by 1995 there were more than 200,000 in tertiary ODL programs (UNESCO 2007). In Pakistan AIOU accounted for 7.8 percent of the bachelor degrees, 1.7 percent of the masters, 13.8 percent of the M.Phils, and 0.4 percent of the PhD of the public sector graduates between 1996 and 2001. In Sri Lanka, data for 1999 indicated that while OUSL's share of graduates at the undergraduate level was very low, they accounted for 31 percent of the postgraduate degrees in the arts and 32 percent of those in management. (Raza 2008)

6.62 There is also little analysis of their cost effectiveness. In part this is because there is little information on completion rates since students enrolled in these programs typically have a longer period of time to complete than in conventional institutions. In addition, in many systems that have fixed completion dates, students are allowed to re-enroll.

³² This section is based on Raza (2008) for some of the specifics for South Asia, Perraton (2000), and UNESCO (2007) for the more general discussion of the benefits and lessons of ODL and OECD (2008d) for some of the future directions.

³³ Distance education is defined as "an educational process in which a significant proportion of the teaching is conducted by someone removed in space or time from the learner" Open learning is defined as "an organized educational activity based on the use of teaching material, in which constraints on study are minimized either in terms of access, or of time and space, pace, method of study, or any combination of these" (Perraton 2000, p.12).

³⁴ This includes converting conventional institutions to dual mode institutions. By 2001 at least 64 traditional face to face institutions had converted to dual mode institutions.

C. LESSONS AND IMPLICATIONS FROM SOUTH ASIAN EXPERIENCE

6.63 Raza (2008) analyzes ODL in various South Asian countries, and provides some interesting findings with important policy implications. The pass rates (percentage of students who sit for an examination who actually pass) are roughly equal to those of students at conventional tertiary institutions. However, the completion rates (percentage of students that complete a program compared to the intake over a period of time) are lower. This is primarily because a large number of students who register do not attend any course, and many drop out after attending some classes. However, completion rates vary greatly across ODL institutions, types of programs, and specific subject matter. The data for South Asia is consistent with that in other parts of the world (Perraton 2000). Completion rates are better for short term certificate programs and for postgraduate programs, and they are lower for bachelor and diploma levels. Moreover, they are lower for technical subjects (such as engineering or accounting) than for non-technical subjects (such as liberal arts). The study also found that per students costs for those who completed programs at IGNOU and AIOU were not lower than those at conventional tertiary institutions in India and Pakistan, respectively if they were based on comparisons of completion rates per student.

6.64 The lack of cost savings was attributed to wastage resulting from high drop out rates (around 70 percent) from the ODL programs. These comparisons did not explicitly take into account the possible saving in opportunity costs for ODL students who may be working while taking the ODL courses versus students at conventional tertiary institutions who may tend to be full time. However, the study does suggest that ODL programs may not be as cost effective as many had expected.

6.65 While the study used data from 1996 to 2002, and there have been subsequent improvement in ICT delivery and the pedagogy, organization, and management of ODL systems, it does provide some relevant implications. One is that more complete data has to be collected on the relative performance of ODL programs versus conventional tertiary education programs. This should include more attention to direct and indirect costs and outcomes (for example what is the benefit for students who participate in some ODL but do not complete the program, how does the market evaluate the graduates of ODL versus conventional programs, and is there any difference in their relative performance over time?) A second is that it is important to tailor and focus ODL programs and subject areas where experience has shown that it tends to be more successful. A third is that more has to be done to reduce the very high wastage rates of ODL programs, and to concentrate on successful completion rather than simply on expanding enrollments.³⁵

VI. TRADE IN EDUCATIONAL SERVICES IN SOUTH ASIA

A. STUDENTS FROM SOUTH ASIAN COUNTRIES STUDYING ABROAD

6.66 Table 6.6 shows the number of South Asian students studying outside their home country at the tertiary level. The highest ratio of students studying abroad to tertiary

³⁵ For lessons of the experience in distance education from OECD countries see OECD (2005a).

students in their own country are in Afghanistan (10.8 percent) and Nepal (5.3 percent), followed by Pakistan (3.3 percent). The large percentage outside Afghanistan is due to domestic instability. The high percentage in Nepal and Pakistan may reflect more limited options in those two countries, and domestic constraints on the quality as well as the supply.

Table 6.6: International Flow of Mobile Students at Tertiary Level 2006

	Total Students Studying Abroad	As % of Tertiary Students in Country	Students From Abroad in Country	Net Flow of Students (inbound-outbound)	Net Flow as % of Tertiary Students in Country
Afghanistan	2,993	10.8	...	...	...
Bangladesh	16,687	2.8	939	...	...
Bhutan	626	...	...	...	...
India	139,459	1.1	7,589	-119,340	-0.9
Iran	19,720	0.9	2,092	...	...
Maldives	1,216	...	...-	...	...
Nepal	10,572	5.3	...	...	...
Pakistan	23,795	3.3	...	...	...
Sri Lanka	11,266	...	..-

Source: UNESCO (2008, Table 10).

B. THE GATS AS IT APPLIES TO TRADE IN EDUCATIONAL SERVICES

6.67 The General Agreement on Trade in Services (GATS) classifies trade in services into four types.³⁶ The bulk of the trade takes place through direct consumption abroad (mode 2). Restrictions include immigration requirements in the host country, foreign currency controls and, difficulties having degrees recognized in the home country. Therefore agreements regarding standards for degree conversion/recognition would be helpful. On a more ambitious note, agreements on licensing and accreditation would also help. However, there has been an increase in cross-border education services (mode 1) facilitated by developments in information technologies and internet infrastructure. The main barriers here include the quality of the service, and the lack of recognition of the degree by the host country.

6.68 There are three common forms of commercial presence (mode 3): franchises, joint programs (where students may spend time in the foreign country for part of the studies), and full local presence. Franchises and joint programs tend to be more common than full local presence. Barriers to commercial presence include: inability to be recognized as a degree/certificate granting institution in the host country, limits on direct foreign investment (including specific caps on foreign ownership percentage), nationality

³⁶ Mode 1 is cross-border supply of educational services using distance technologies. Mode 2 is students going abroad for study. Mode 3 is commercial presence of the foreign education provider in the country through the establishment of a foreign affiliate. Mode 4 is movement of teachers temporarily to the country of the consumer to provide the service.

requirements, restrictions on recruiting foreign teachers, and unequal competition from government subsidies to local institutions.

6.69 Barriers to presence of natural persons (mode 4) include immigration requirements, nationality restrictions, and recognition of credentials.

C. THE SITUATION OF THE FIVE LARGEST SOUTH ASIAN COUNTRIES

Bangladesh

6.70 Bangladesh has not undertaken any commitments under the WTO, but it has opened its education system to trade in services. Major destinations for education abroad are the US, Canada, the UK and India. Bangladesh attracts students from Nepal, Bhutan, India, and some African countries.

6.71 Bangladesh already has relationships regarding education with Bhutan, India and Nepal. It would appear that Bangladesh would benefit from opening trade in educational services. Bangladeshi students studying abroad at the tertiary level are 1.7 percent of total tertiary students in Bangladesh. It is likely that by opening up more to trade in educational services more students would study in Bangladesh and save the country some foreign exchange and strengthen Bangladesh's higher education sector.

India

6.72 India did not undertake commitments under the Uruguay Round or during its initial offer. However, it has a revised offer which includes commitments in higher education. Because of the strong excess demand for education services in India and constraints on public supply, there has been significant interest from foreign providers.

6.73 Students have also been recruited from India by foreign institutions to study abroad. The number of foreign providers offering programs in India increased from 27 to 144 from 2000 to 2004, although one-third were not universities, and an equal number of their Indian collaborators were not part of the higher education system either (ADB 2008, p. 166.)

6.74 Although even 100 percent entry by foreign higher education providers is permitted, in practice it is very difficult for foreign providers to enter because of India's vast and complex regulatory system for higher education. For example, the All India Council for Technical Education (AICTE) which oversees engineering and management education requires that besides being accredited in their home country, their degrees must be the same; and there are no provisions for conversion to the nomenclature approved by the University Grants Commission. In addition, the UGC, the AICTE and other statutory councils prescribe minimum standards on infrastructure, faculty, and duration of program, eligibility criteria and fees. Furthermore, the institutions are also subject to additional regulations at the level of the state they operate in.

Table 6.7: Summary of Commitments for Each Mode, by Country

	Trade in Educational Services Mode 1	Students Studying Abroad Mode 2	Foreign Institutions in Country Mode 3	Foreign Teachers in Country Mode 4
Bangladesh	No formal commitments	No formal commitments	No formal commitments	No formal commitments
57 India	India requires service providers to follow same regulations as domestic providers	No formal restrictions	No maximum foreign equity cap, but lots of regulations constrain commercial presence. Fees subject to approval by domestic authority. Institutions that have prior investments need permission from the FIPB to open additional universities. Regulation of higher education institutions at Federal and State levels and by more than one body	Unbound, however with respect to national treatment which is quite liberal across other service areas, educational services are not included. This may negatively impact teachers from other Asian countries.
Nepal	No national commitment to provide foreign exchange to pay foreigners for cross-border services.	No formal limitations	Maximum foreign equity at 51%, but being raised to 80% in 2009. Foreign investment and reinvestment of earnings require permission. Incentives and subsidies available only to wholly Nepal owned enterprises	Unbound and refers to horizontal section where there is no special provision for education. Therefore movement of teachers and related professionals seems to be closed.
Pakistan			Maximum foreign equity limited to 60%. High minimum land and endowment requirements imposed on private institutions to set up a campus.	Liberal entry of professionals, and others having skills to supply education, but is limited to imparting training.
Sri Lanka	No sectoral commitments	No sectoral commitments	No sectoral commitments. However 100% foreign equity allowed on a case by case basis in consultation with relevant state agencies was agreed to earlier during Uruguay Round	No sectoral commitments

Source: Based on ADB UNCTAD (2008)

Pakistan

6.75 Pakistan did not make commitments under the Uruguay Round, but its initial offer includes education services and is relatively open as compared to other South Asian countries. Pakistan has offered full commitments in modes 1-3. Mode 4 is unbound, but refers to horizontal commitments where it is quite open to entry of professionals. The main restrictions are: foreign equity cap of 60 percent for commercial presences, no sectoral mode 4 commitments, no national treatment with regards to subsidies.

6.76 Because of excess demand and limited supply of higher education there has been an expansion of private higher education institutions in Pakistan. However higher education in Pakistan lags behind that of some other countries in the region. As a result, as noted in Table 6.8 it has a higher proportion of students studying outside the country. Therefore it would probably do well to open up to more foreign direct investment in education, as that may provide more quality higher education at a lower cost than having students go abroad for very expensive foreign education.

Nepal

6.77 Nepal undertook commitments with no limitations on modes 1 and 2 in market access. However, mode 3 has a maximum foreign ownership of 51 percent (to be raised to 80 percent by April 2008 when it completes five years of joining the WTO.)

6.78 Nepal has the lowest enrollment rates at the tertiary level among the five major South Asian countries. It also has a problem of brain drain in tertiary education. There is a mismatch between the skills provided by the existing system and the needs of the market. This is particularly so for the IT market which suffers shortages even though there are various specialized foreign training institutes such as NIIT, STG, SSi, Pentasoft, and APTECH in the IT sector, in addition to training provided by the formal higher education system. Various Indian higher education institutions already operate in Nepal. A leading example is a medical college run by the Manipal College of Medical Sciences which is ranked as the best college in Nepal. Currently students from Nepal studying abroad are 5.3 percent of the total number of students studying in Nepal. Nepal would benefit from opening up more on its trade in education services, particularly with respect to greater foreign ownership limits, and immigration of teachers as it will benefit from having more capacity in the sector to improve economies of scale and probably also save foreign exchange.

Sri Lanka

6.79 Sri Lanka has not undertaken any sectoral commitments in education services, but it did allow up to 100 percent foreign ownership under the Uruguay Round. Private tertiary education has been very contentious in Sri Lanka and the government is the only provider of accredited tertiary education. Although there are ambiguous rules regarding private tertiary education, several private degree granting institutions have been established, especially in tertiary programs in accounting, management and IT. Many of these are in collaboration with foreign institutions. By some estimates less than 15 percent of the eligible students are admitted to public universities.

6.80 As a result, students who can afford it study abroad, especially in the US, the UK and Australia. India is also appealing to Sri Lankan students because of lower costs and proximity. However, many Sri Lankan students who earn degrees in India face problems getting them recognized by the Sri Lankan authorities, and often have to pass Sri Lankan certification exams. It would make sense for India and Sri Lanka to develop mutual recognition agreements, given the already existing level of interaction. In addition, Sri Lanka would benefit from greater trade in higher education services, given limited domestic supply.

VII. CONCLUSIONS AND POLICY RECOMMENDATIONS FOR HIGHER EDUCATION

A. SUMMARY AND CONCLUSIONS ON HIGHER EDUCATION IN SOUTH ASIA

6.81 Global competition is becoming more demanding and obtaining a tertiary education is becoming more critical for job seekers to compete successfully. Populations of South Asia are growing and demand for higher education is rising rapidly. Other countries are moving ahead dramatically (particularly China—see Section VIII). There is ample evidence that higher education is important for economic growth. In the case of India, in particular, it is clear that the critical mass of skilled English speaking engineers was a crucial factor in the development and growth of the information technology-enabled services. These have been leading sectors in the rapid growth of the modern service sector in India as well as other South Asian countries. Higher education also has been very important in the rapid growth of other modern high skilled service sectors in India and other South Asian countries. These include financial services, real estate, and education services.

6.82 However, in spite of the success in the growth of modern high skilled services in South Asian countries, they lag behind the rest of the world in the expansion of higher education. In addition, it is clear that there has been a constraint in the supply of quality higher education. This can be seen from the rapid expansion of private higher education sector, the sizable number of South Asian students who pay large sums to study abroad, the still high and even rising returns to higher education in most South Asian countries, and the rapidly rising salaries of graduates from the best engineering schools.

6.83 There are many problems in the higher education sector in South Asian countries.³⁷ The challenges of the higher education system across the five countries are very similar—access, quality, relevance, financing, and governance. The countries have taken somewhat different approaches to dealing with these challenges. This has included different degrees of regulation and privatization. They have had mixed results across the five countries not only because they have come from different perspectives, but also of differences in degree and capacity for implementation.

³⁷ See Kapur and Crowley (2008) for a general discussion of some of the problems of higher education in developing countries.

6.84 Some of the key issues requiring special attention include:³⁸

- Higher education has a long gestation process. It is the apex of a pyramid that has typically been 18 years in the making. While it is possible to implement some reforms that will improve higher education in the short run it is also important to begin to reform the whole education pyramid (Section IX).
- Countries need to invest both in expanding higher education as well as in expanding access to, and quality of, basic education. This requires careful thinking through of the rationale for public investments in education. The critical role of government is to invest in education as a public good. This includes most of basic education, maybe some of secondary education, and just a portion of tertiary education. Many areas of higher education – namely the professional schools can be delivered by private providers.
- South Asian governments should consider charging higher tuitions for elite public higher education institutions such as at the Indian Institutes of Technology and Indian Institutes of Management. The graduates of these institutes receive very large wage premia and would be able to afford tuitions that cover most of their costs. China was able to rapidly expand its public higher education system by charging tuition that cover 40 percent of costs. Government should focus instead on financing research universities and areas of higher education that have a public good content, and typically will not be financed by the private sector or pay high wage premia. Government can support them directly, or indirectly through competitive grants that private universities also can compete for.
- More also has to be done to improve the effectiveness in the allocation and effective use of public education budgets as well as to find more cost effective ways of delivering education, including more efficient distance education, blended learning, IT-based instruction, short duration professional courses, etc
- Governments also have to develop alternative funding mechanisms, including developing more effective student loan systems. In addition as more of higher education is provided privately for a fee and as tuitions are raised in public institutions, the Government will have to do more to address the equity problem in access to higher education. This involves grants to needy but qualified students. It may also involve affirmative action. The higher education system is typically the means through which inequality is perpetuated. While affirmative action efforts can offer excluded groups an opportunity to get an education that can improve their earning potential, overly ambitious affirmative action goals may undermine quality of higher education if the target groups are not up to standard. Therefore it is important to open access to quality education to disadvantaged groups from the earlier stages in the education pyramid—going all the way to down to primary education. This is a complex area especially given excess demand for education and limited supply. Governments can mitigate some immediate trade-offs by enlarging the number of places in higher education, as is

³⁸ For some excellent analysis the key issues in reforming Indian higher education see Kapur and Metha (2007).

being done in India, but they also have to create enrichment programs to improve the qualifications of the affirmative action candidates so they may succeed in higher education.

6.85 Growth of the Indian ICT industry has driven demand for quality higher education. Many education providers have entered the market to fill the growing needs of this skill-intensive sector. The industry has been able to overcome some of the challenges that stifle the supply of high quality higher education, including governance and regulatory constraints on the system. While this may not be easily generalizable to other sectors, it does show that the constraints can be broken when the private sector takes a strong initiative, and works directly with higher education institutions as well as with government.

6.86 South Asia pioneered distance education and virtually all countries have some element of distance education. This technology has the potential to significantly reduce the costs of delivering tertiary education services to many students. However, the review of distance education initiatives indicated that there are still many problems with the effective implementation of the technology. More work needs to be done to harness the potential of this mode of education delivery.³⁹

6.87 South Asian countries are participating to different degrees in trade in educational services. The most developed is the GATS mode 2 whereby South Asian students go abroad for study. Some of this foreign study is to other countries in the region, particularly India. However, most of this movement of students is to the UK, Australia, the US and other European countries, which implies high foreign exchange costs. There is scope for greater liberalization in mode 3 (foreign presence), mode 4 (foreign teachers), and mode 1 (international distance education). This could be more cost effective ways of meeting the shortage of domestic supply of quality higher education. Also greater use of modes 3 and 4 could increase economies of scale and specialization to strengthen higher education in South Asian countries as competitive sectors in their own right. This could also strengthen the prospects for South Asian countries themselves to be larger exporters of educational services, not only for trade among themselves, but to also to countries outside the region.

B. THE OPPORTUNITIES FOR REGIONAL COLLABORATION IN HIGHER EDUCATION

6.88 The rationale for a regional approach is based on two elements. The first element is that the issues South Asia confronts on education are very similar. There are large economies of scale in developing common frameworks and in applying them over the larger population of the South Asian region. South Asian countries are faced with a more complex international environment and the increased importance of, and demand for, quality higher education. Thus there is scope for intra-regional cooperation in many areas. There is scope to share general experiences on how they are dealing with the challenges, what is working, and how things can be improved. At a more specific level there is scope for cooperation on issues such as: standards, accreditation, and certification; curriculum development, distance education delivery platforms, and the

³⁹ See OECD (2005a) for more on the experience of developed countries.

political economy of the reform process. There is also scope for developing joint programs where the region can build economies of scale by working across national boundaries.

6.89 Regional cooperation is already happening in the ITES service area. Some of the large foreign and regional companies and international universities are already working across national borders. Joint programs exist to train new students as well as to upgrade the skills persons already employed in this sector. However, there should be scope for more formal collaboration across national boundaries by the public higher education sector.

6.90 Opening up more to mode 3 (trade in services) would help to relieve the domestic supply constraint and may provide a lower cost and way of addressing the demand. Since a lack of qualified teachers is another important constraint, allowing greater movement of teachers (mode 4) would help to relieve that supply constraint. Upgrading teacher training would also help. India is the already a major provider of educational services to the South Asia region through all four modes. Currently India gets thousands of students from Bangladesh, Nepal, and Sri Lanka. They get some concessions at Indian public institutions. There also is great potential for more trade in education services through mode 1, facilitated by the internet. This will require regional cooperation on accreditations and recognition of degrees.

6.91 The second element of the rationale for regional cooperation rests on the shared history and culture of many South Asian countries. There is a common legacy of British heritage; the English language and in the structure and key institutions in South Asian higher education systems. This gives them a common ground which facilitates interaction. There is much greater commonality across the South Asian countries than with the world as a whole. It makes sense for regulatory bodies, such as the UGC and various accrediting agencies, to work with their counterparts in the countries in the region to develop some common standards in curricula, licensing, accreditation, recognition of qualifications, and monitoring both profit, and non profit institutions.

6.92 However, in spite of the common British heritage in higher education, there is one important caveat. South Asian countries must decide whether that heritage is helping or hindering them compared to what is happening in the rest of the world. They also have to take into account how they should relate to standards being set up by the rest of the world. One place to start is to see how the British system itself has been going through important transformations to improve the efficiency, relevance and competitiveness of British higher education with respect to the rest of the world.⁴⁰ The second is to decide which system or what combination of higher education systems and standards they want to align themselves with. In the important area of engineering education there are two systems. One is the US system. The other is the evolving European Community system. There are also economies of scale and scope in studying the advantages and disadvantages of these systems for their own specific situations, and how they should be factored into their own accreditation and certification standards.

⁴⁰ Note for example, that there has been significant reform of the British higher educational system including making state financed colleges and universities more responsive to the needs of the productive sector, as well as significantly increasing tuition fees in order to improve their quality and competitiveness.

6.93 On a more ambitious note and looking more towards a period when there is greater regional integration in trade, South Asia may also want to look at the model of what the European Community has been doing in to integrate higher education. This is the Bologna Process which aims to establish a European Higher Education Area by 2010. The Bologna Process uses four objectives to create a convergent system of education. This includes: a common framework of recognizable degrees; a two cycle—undergraduate and graduate—system in all participating countries; a European credit transfer system to recognize course credits and learning experiences in other member countries; and a system of common quality assurance, including an overarching framework of qualifications. While this is not to suggest that South Asia needs to do the same, it would be worthwhile to explore avenues for collaboration, including perhaps some collaboration with the EU system itself. In the short run, there is also scope for more international cooperation on phasing in international standards in professional areas such as engineering, medicine, nursing, and accounting.

VIII. EDUCATION AND THE DEVELOPMENT STRATEGIES OF INDIA AND CHINA

6.94 There is an education paradox in the comparison of the export structure of India and China. India has developed a comparative advantage in the high-skilled service sector exports, while China has developed a comparative advantage in manufacture service exports, even though India has a lower general education attainment than China. There is the notion that India's rapid growth based on services shows there is an alternative development model based on skipping from agriculture to services rather than the traditional development model from agriculture to industry, and eventually to services. There is also the concern of whether services can be the engine of growth for South Asia.

6.95 Although this is a topic that requires more extensive analysis, this section attempts to provide some insights into this discussion by first comparing education in India and China. It will then summarize some of the critical elements of the broader development strategy of these two countries which may help to explain the different structures. It also has some implications for future development strategies in South Asia.

A. EDUCATION IN INDIA AND CHINA

6.96 This section first compares literacy, primary and secondary education. It then compares secondary and higher education enrollment rates and stocks, and makes concluding comments on life long learning.

6.97 *Literacy and Primary Education* As a very poor developing country even just 25 years ago, China had very low average levels of education, although it already had a literacy rate that was more than 60 percent higher than India's (see Table 6.10 for all the comparative education figures). Over the last 25 years it has made massive investments in basic education and now has a literacy rate nearly as high as developed economies. India

still has very low literacy rates. Illiteracy is 52 percent among women and 27 percent among men. Its basic education system is still very poor with tens of millions of primary school children out of school.

6.98 **Secondary education** China also invested earlier in secondary education. By 1980 secondary enrollment rates were already 50 percent higher than in India. Although India increased secondary enrollment rates over the last 25 years, China has also increased its enrollment rates and has maintained its 50 percent lead over India. China's edge in secondary education has been very important in preparing its large labor force for a massive expansion of the industrial sector. It has also been one of the attractions for labor intensive, export oriented foreign investment.

Table 6.8: Education Comparison: China and India

	China	India
Literacy rate, population 15 & above		
1980	67.1	41.0
1990	78.3	49.3
1995	80.8	53.3
2006	90.9	61.0
Av. Ed. Attainment of Adult Pop. (2000)	6.35	5.06
Gross Primary Enrollment Rate		
1980	113	83
2006	111	115
Secondary Education Enrollment Rate		
1980	46	30
2006	76	54
Higher Education Enrollment Rate		
1980	2	5
2006	22	11
Total stock of persons with higher education (2005 in millions)	70.3	52.6
Scientist and engineers in R&D		
1995	531,997	145,115
2006	926,252	117,528
Skilled labor	<i>Well developed</i> training market inside and outside firms	<i>Very under developed</i> Very poorly developed training market

Sources: Stock of persons with higher education, OECD (2008); Scientists and Engineers in R&D, World Bank (2008b); Others: WDI, various years.

6.99 **Tertiary education** China has undertaken a massive expansion of its tertiary education system starting in the late 1990s to make up for the havoc reeked on the educational system after the Cultural Revolution (1965 to 1975). In 1980 China had less than half the tertiary enrollment rates of India. By 2005, its enrollment rate reached 22 percent. Starting in the 1950s, India set up seven Indian Institutes of Technology and later several Indian Institutes of Management, which produced a critical mass of well educated English speaking professionals who have been instrumental in India's emergence in software and ICT-enabled services. India has expanded tertiary enrollment rates, but it has not done so as fast as China. Although India enrollment rates were more than twice those of China's in 1980, in 2006 they were just half of China's. Also, the quality of higher education is poor with the exception of those mentioned above (which

produce less than 7,000 graduates a year), the Indian Institutes of Science and some of the regional engineering colleges. The low quality of tertiary education and the regulatory constraints on expanding high quality institutions appeared to be a road block to India's continued rapid growth in knowledge-intensive services. However, as noted in Section IV, the ICT industry in India took the initiative in addressing this concern and it appears that the higher education system is responding at least with respect to quality IT education. The challenge is to what extent these reforms can be expanded to the higher education system more broadly.

6.100 Because of China's rapid ramp up of higher education, the stock of persons with higher education in is 70 million, compared to 53 million in India.⁴¹ In addition, China has nearly one million scientist and engineers involved in R&D, which is almost eight times the number in India. In 2006, China spent 1.4 percent of GDP on R&D vs. 0.85 percent in India. In purchasing power parity terms, this amounts to \$ 82 billion dollars in China versus \$23 billion in India. In addition, Indian universities only perform 4.4 percent of this R&D vs. 10.0 percent in China (and 14.4 percent in the US).⁴² Thus, India is falling behind China because of its weaker education system in general and its tertiary education system in particular.

B. EDUCATION AND THE DEVELOPMENT STRATEGIES OF INDIA AND CHINA

6.101 There are four factors that help to explain the different economic and trade structure of India and China- trade, FDI, infrastructure, and education and language.

6.102 **Trade Policy** Arguably the most important has been trade policy. China started trade liberalization in the late 1980s, about a decade earlier than India. Learning from the success of its Asian neighbor such as Hong Kong, Korea, Singapore and Taiwan it opted for labor- intensive manufactured exports.⁴³ This started with four export processing zones across from Hong Kong and Taiwan. These were successful at generating foreign exchange and employment growth so they were expanded to another 19 zones. In addition, China eventually committed to joining the WTO and as part of that process it committed to significant liberalization in goods and services. Furthermore, because of more open trade policy, China has been rapidly increasing the technology intensity of its exports. In 1996 the share of high technology products in its manufactured exports was 21 percent compared to 10 percent in India. In 2006 the share of high technology products was 30 percent in China, compared to only 5 percent in India.⁴⁴ Part of this difference is that China imports a lot of high technology components for the electronic products it exports. Another is that a lot of these exports are made by foreign multinationals exporting from China. However, a third part of the explanation is that China has a higher skilled workforce that is able to produce more sophisticated products and that China has also been investing very rapidly in higher education and in science and technology, as noted above.

⁴¹ OECD (2007b).

⁴² Dahlman (forthcoming 2009).

⁴³ See Naughton (2007).

⁴⁴ WDI 2008 and 1999.

6.103 India was largely a closed economy until its forced trade liberalization after the 1991 financial crisis, as part of the IMF conditionality for structural adjustment. India has liberalized further since then.⁴⁵ However, even by 2006 the average weighted tariffs on manufactured products in India, at 14.5 percent, was more than three times that in China, at 4.3 percent.⁴⁶

6.104 In China, the rapid development of very large labor intensive manufacturing export sector led to massive migration of workers from the interior of China to the coastal provinces. This is one of the largest internal migrations in history. Exports of manufactured products were 50.5 percent of manufactured value added in 1995 and increased to 102.1 percent by 2006 in China. In India they went from 32.5 percent in 1990 to 69.2 percent in 2006. However, the total volume of manufactured exports from India in 2006 was less just 60 percent of the increase in manufactured exports from China between 2005 and 2006.⁴⁷

6.105 **Foreign Direct Investment** A key element of Chinas trade strategy was to use foreign direct investment to get into exports. China used FDI to get access to technology and to markets. FDI was allowed into the first export processing zones, and they were important in the subsequent zones.⁴⁸ India was very suspicious of FDI inflows, and only liberalized slowly in the 1990s. Even since 2000 the inflows of FDI into India have only been a fraction of those into China. Average gross FDI into India as a percentage of GDP for 2000-2005 has only been 0.9 percent versus 3.1 percent for China. Estimates are that as much as 60 percent of Chinese manufactured imports into the US are products made by US multination companies.

6.106 **Infrastructure** Another important element in why China has a comparative advantage in manufactured exports is that it has relatively efficient port and transport infrastructure and less bureaucracy in imports and exports. India's much higher cost of infrastructure and more bureaucratic procedures to get goods in and out make it less competitive in manufacture product trade. The IFC (2009) Cost of Doing Business Report ranks China 48th and India 90th among 181 economies in the ease of doing business across borders.⁴⁹ One reason why India has a comparative advantage in exports of ICT-enabled services is that they do not have these high transactions costs,

6.107 **Education and Language** Finally, China had a more literate labor force and was able to rapidly expand secondary education which greatly contributed to the capabilities of the very large number of workers required for it labor-intensive manufactured products export industry. The low cost and good skill levels of it labor force was one of the key attractions of putting labor-intensive operations in China. On the other hand, the core stock of English speaking engineering and technical graduates in India, as well as the strong connection of the Indian diaspora to the ICT industry in the US and Europe were

⁴⁵ See Panagariya (2008).

⁴⁶ WDI 2008 and 1999.

⁴⁷ Based on calculation with data in WDI 2008.

⁴⁸ See Naughton (2007, Chapters 16 and 17).

⁴⁹ The measure includes the number of documents and number of days and the cost required to import and to export a container of freight—see IFC (2009).

the main attractions in off shoring IT-enabled services to India. In addition, once India developed a reputation for good quality higher education services many foreign firms chose to set up subsidiaries in India to tap that talent pool and they developed a virtuous circle for the rapid growth of high skilled services.

6.108 Sustainability of service-led Growth in South Asia. How sustainable is India's continued rapid growth in information-enabled services exports and its service-based growth more generally? It is clear that India has developed a strong comparative advantage in IT-enabled exports and that these can increase, particularly now that the IT sector has adopted standards and is working with the higher education institutions and government to address the issue of graduate quality. There is also some evidence of IT-enabled service export growth from other countries in South Asia.

6.109 The IT-enabled service sector growth has been decoupled from the domestic economy since so much of it has been driven by exports, in particular to the US.⁵⁰ In the short run, the demand for these services is likely to be negatively affected by the sharp global economic downturn which will reduce demand. There is also the risk of a protectionist backlash in some developed market economies such as the US given the severity of the downturn and the very rapidly rising unemployment rates. In the medium run there is some concern that some of the more routine work that was being off-shored can also be done by automated machine based processes. In addition, other countries, including China, as well as in Central and Eastern Europe, the Middle East, Latin America, and Africa and are moving into this export sector.

6.110 However, India developed strong capabilities in this sector. Its IT firms are also moving up the value chain to more knowledge-intensive activities including software development and IT integration services, and beginning to off shore some of the more routine work to other countries in the region with lower wages. There is likely to be increasing globalization of services work. But attracting this work to South Asian countries is not just a matter of improving tertiary education. As noted in rankings such as those used by AT Kearney (Annex A) other important considerations are total compensation costs, work force availability and flexibility, tax and regulatory costs, the country and business environment, infrastructure costs (not just IT services, but also electricity, travel, and rental costs), intellectual property and security. Thus it also requires making progress on the broader investment climate and improving infrastructure--which has been a challenge for South Asian countries.

6.111 The sustainability of rapid service based growth beyond the IT-enabled service sector depends on the broader growth prospects in India, South Asia and the world more generally. This is difficult to predict now given the magnitude of the crisis and the probability that it will lead to significant restructuring of the financial as well as the real sector in the US and other developed economies. Looking beyond the crisis, though, there certainly is strong potential for continued high productivity increases in the service sector in South Asia because these countries are still far behind the technological frontier in many areas, and particularly in distribution and retail trade. This continued productivity increase will be spurred by increasing de regulation and competition.

⁵⁰ The US market represents 60 percent of Indian IT enabled services (NASSCOM 2009).

6.112 The concern however is that the high growth, high productivity sector is not generating much employment relative to the size of the rapidly growing labor forces in South Asian countries.⁵¹ The challenge will be how to absorb that labor productively into the modern economy. That will require strengthening the general education base of the workers and greater employment in manufacturing as was done in China. Based on its track record the modern service sector itself cannot absorb the rapidly growing labor force. Moving to more labor-intensive and inclusive growth will require addressing broader constraints such as excessively rigid regulation of labor and land markets, further reduction in red tape and in the cost of doing business; and significant improvements in power, transportation infrastructure and social services.

6.113 South Asian countries need to improve the competitiveness and labor absorption capacity of their manufacturing sectors. Manufacturing wages in China have been rising faster than in India. To the extent that they continue to rise faster after the crisis, space will be opened up for greater labor-intensive manufactured exports from India and South Asia more generally, provided that the labor force is better educated and that some of the broader regulatory and infrastructure constraints are addressed.

6.114 However, it should be emphasized that India and other South Asian countries need to continue to improve the quality and supply of higher education. Quality higher education has become critical for countries to compete in the increasingly knowledge-intensive global knowledge economy. As noted, China is also moving up the value chain very rapidly and investing heavily in R&D and its own innovation sector. India and other South Asian countries need to increase their capacity to absorb knowledge from the rest of the world as well as to generate more of their own knowledge. This requires a strong higher education sector and greater research capability.

6.115 Thus, South Asian countries need to make significant improvements in the quality and supply of basic and secondary education, as well a higher education. The education sector itself also can be a relatively important source of employment at the same time that it is a critical input into improving the performance of an economy.⁵²

IX. THE BROADER CHALLENGE OF POPULATION, EDUCATION, AND GROWTH IN SOUTH ASIA

A. POPULATION EDUCATION AND GROWTH

6.116 South Asia has a large population. It is also a rapidly growing population. Some suggest that this young and growing population can give South Asia a “youth dividend” as the growing number of young workers joins the labor force. However, for that

⁵¹ Even by 2009, the IT-enabled service industry in India does not employ much more than 0.5 percent of the labor force.

⁵² The education sector accounts for 10 percent of service employment in Sri Lanka and 12 percent in India (the two countries for which there is a disaggregated breakdown of total service employment). The health sector is another important part of the service sector that can be expanded and provide more employment opportunities.

dividend to materialize, this new labor force has to be educated, trained, and productively employed. A key issue therefore is how to turn this large and growing population into an asset than can contribute to growth rather than to have it become a liability, as new entrants to the labor force fail to find other than low productivity subsistence type employment .

6.117 South Asia’s school population is almost as large as East Asia’s (and will soon be larger given their higher population growth rates). On the other hand, public spending on education is smaller even than their share of global GDP. The challenge therefore is how to educate this enormous population.

6.118 Literacy and educational attainment of the population in South Asian countries is very low. It is the lowest for any regions, including Sub Saharan Africa. Literacy ranges from a low of 28 percent in Afghanistan to a high of 96 percent in the Maldives. Bangladesh is just 44 percent, Pakistan 50 percent, and India 61 percent.

6.119 Recent research has been showing the importance of agglomeration economies that occur in large urban centers.⁵³ The South Asia region has the highest population density of any region in the world (Table 6.9). It should be able to benefit from these economies of agglomeration if it has a more educated population. It must be noted, nevertheless, that South Asia has the highest percentage of rural population among all the regions, and the lowest percentage of population in cities of over one million. However, it does have many thriving cities with potential for strong knowledge agglomeration.

Table 6.9: Basic Population Indicators World Regions and Selected Countries 2006-2015

Region or Country	Population in Millions		Average Annual Growth Rates	Share of Population (in 2006) between		Pop. Density (2006) Per Sq Km	Percentage of Population (2006)	
	2006	2015		1990-2006/ 2006-2015	0-14 yrs		15-64yrs	Urban	In cities > 1 million*
EAP	1,899	2,033	1.1/0.8	23.5	69.4	120	42	..
China	1,311	1,382	0.9/0.6	21.1	71.1	141	41	18
ECA	460	461	0.1/0.0	19.4	68.9	20	64	17
LAC	556	616	1.5/1.1	29.6	64.1	28	78	34
MNA	311	362	2.0/1.7	32.7	63.0	35	57	20
South Asia	1,499	1,695	1.8/1.4	33.4	61.9	314	29	12
Bangladesh	156	180	2.0/1.6	34.7	61.7	1,198	26	12
India	1,110	1,233	1.7/1.2	32.5	62.4	373	29	12
Nepal	28	32	2.3/1.7	38.5	57.8	193	16	..
Pakistan	159	192	2.4/2.1	36.4	59.7	206	35	18
Sri-Lanka	20	21	1.0/0.3	23.7	69.7	308	15	..
S-SA	782	963	2.6/2.3	43.3	53.6	33	36	..
HIGH Y	1,031	1,071	0.7/0.4	17.9	67.1	31	78	..
EURO ZN	317	320	0.4/0.1	15.5	66.7	128	73	18
WORLD	6,538	7,2001	1.4/1/1	28.0	64.6	50	49	20

* Percentage of population in cities of more than one million is for 2005.

Source: WDI 2008.

⁵³ See Gill and Kharas (2007).

6.120 Given the large population and large higher education system, South Asia should be able to become a major education platform. As demonstrated by India, South Asia has some world class educational institutions. In economists jargon, they have the production function for quality higher education. South Asia has the critical mass of high quality tertiary institution, a rapidly growing number of young cohorts clamoring for higher education, economies of scale, and economies of agglomeration. Therefore it should be able to turn its abundant population advantage into a strategic asset. China has in fact explicitly followed a strategy of turning abundant natural resources to competitive assets.⁵⁴

B. POPULATION EDUCATION PYRAMIDS

6.121 It is important to understand the population and education pyramid of South Asian countries because this has implications for the expected future size of the educational system. Figure 6.2 presents the population and education pyramids for the five South Asian countries covered in this chapter, as well as that of China for comparative purposes.

6.122 Pakistan, Nepal, Bangladesh, and India still have the highest population growth rates (Table 6.9) and therefore have population pyramids that are still very broad at the bottom and narrow down rapidly. Sri Lanka has already gone through a demographic transition with average population growth rate of just 1 percent for 1990 to 2006 and an expected rate of just 0.3 percent for 2006 to 2015. Therefore, it already has a shrinking of the population cohorts at the younger ages and the shape of its population pyramid is closer to that of China which instituted strong population control in the 1980s. All the countries except Pakistan nominally have full enrollment rates at the primary level, although they all also suffer from the problem of repeaters which is why their enrollment rates are above 100 percent (see enrollment rates in the pyramid). Pakistan is an outlier having primary enrollment rates that are just 74 percent for females and 94 percent for males, thus also showing a strong gender bias. However, these numbers for all the countries hide that fact that many children drop out of school before completing primary education.

6.123 At the secondary level Sri Lanka has much higher enrollment rates than the four other South Asian countries (even higher than China) because of its early strong focus on education. India does better than Bangladesh and Nepal, and Pakistan again comes in last. The same pattern is true at the tertiary level. As already noted, enrollment rates in China are twice those of India. What is also striking is just how fast the education pyramid narrows (with the exception of Sri Lanka), as well as the very significant problem of gender inequality in the South Asian countries. It is also very likely that ethnic and other social, caste, or low income groups that have been discriminated against are those that are most excluded from advancing up the educational pyramid. In addition, those that advance are likely to be segregated in the lower quality schools, and therefore are at disadvantage even in the education they receive. Designing affirmative action policies at the higher education level for women, disadvantaged castes or other special

⁵⁴ See Chinese Ministry of Higher Education (2003).

target groups needs to take this into account. Measures need to be put into place to given them more equality of opportunity at the lower levels of the educational pyramid so that they are well prepared for entry to higher education.

6.124 The pyramids in Figure 6.2 give a sense of the flow of education. The small box insert in each pyramid shows a stock measure—the average years of educational attainment of the population 15 years and above in 2000. This ranges from a low of just 2.4 years in Nepal to a high of 6.87 in Sri Lanka. In China it was 6.35 years. However, as China has had a massive drive to increase enrollment rates in upper secondary and higher education since 1998, the average educational attainment of its population over 15 reached more than 8 years in 2006.⁵⁵ Thus the South Asian countries still have a long way to go to turn their abundant human resources to a source of competitive advantage the way China has been doing.

C. MOVING FORWARD

6.125 The key challenges in education and training for South Asian countries are many. All countries need to improve the quality of primary education. All still need to expand access to secondary education and particularly to higher education which is now becoming critical for participation in the knowledge economy. They have to improve the quality of the whole educational system from pre-school to university. They also have to improve the content and relevance of what is taught in the formal educational system.

6.126 In addition, they have to move from an exclusive focus on the formal educational system to the development of life long learning systems. The half life of knowledge is getting shorter because of the speed up in the generation and diffusion of knowledge. This can be provided at the work site, or in specialized schools and training facilities, or at home or elsewhere.

6.127 The education and training systems of most countries, developed as well as developing are seriously fragmented. The biggest part of the system is the formal education typically provided by the Ministry of Education. But many other ministries are still involved in the provision of education, including many sectoral ministries. Similarly, while training is provided primarily by the Ministry of Labor and Social Security, many other ministries and organizations as well as trade unions and private enterprises are also involved in training. In addition, there are multiple non-government domestic and foreign providers of education and training with their own standards and qualification systems.

6.128 The government alone cannot build a lifelong learning system by itself and it is not just because of limited public finance.⁵⁶ In virtually all the South Asian countries, there has been significant growth in private higher education, given the importance that parents and students put obtaining degrees to improve their livelihoods. However, beyond allowing excess demand to be met by the private providers, an effective education and training system must involve the multiple players and develop multiple pathways. This requires a broad partnership and a streamlined and effective governance structure. That

⁵⁵ See Dahlman, Zeng, and Wang (2007).

⁵⁶ For a detailed application of this to China see Dahlman, Zeng and Wang (2007).

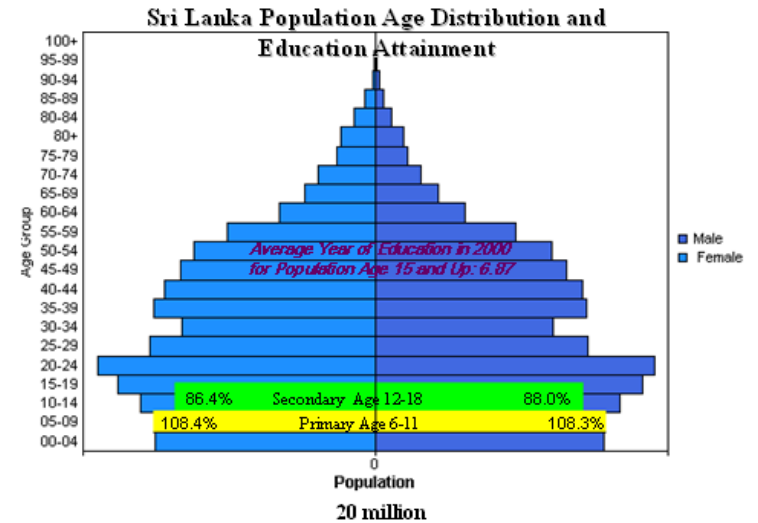
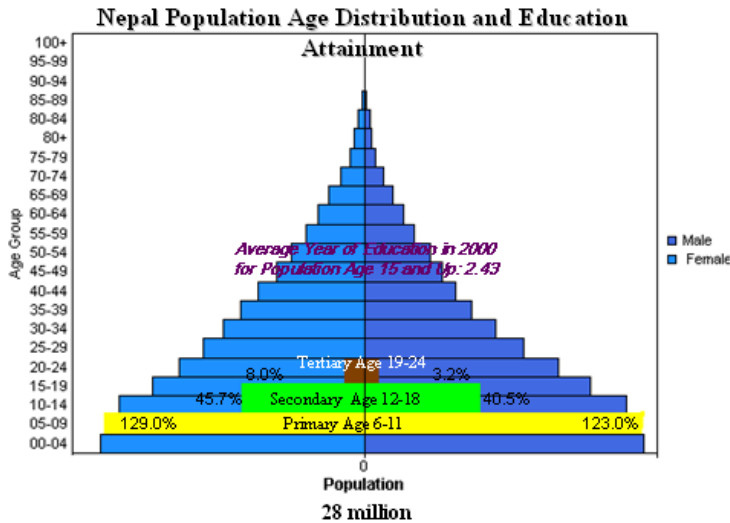
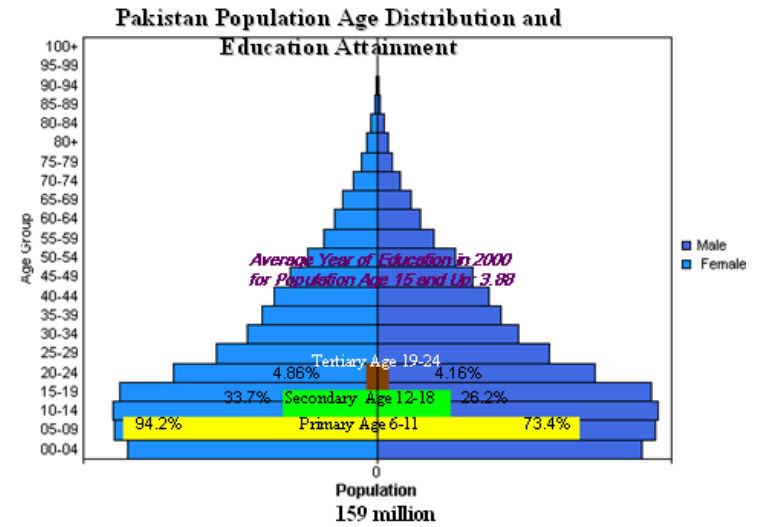
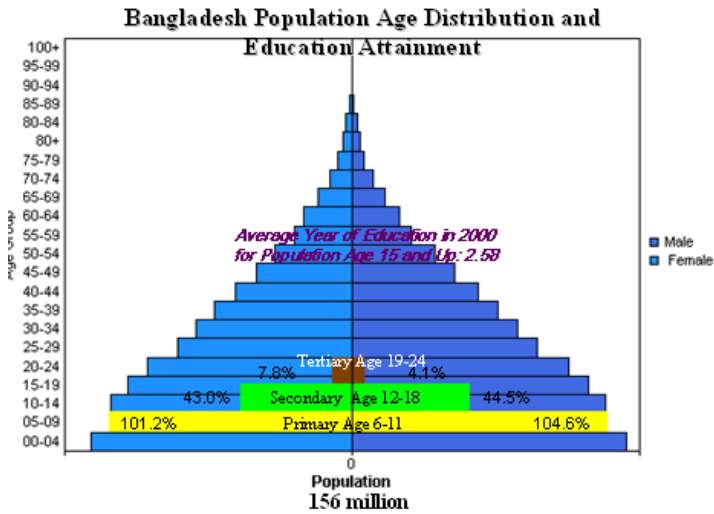
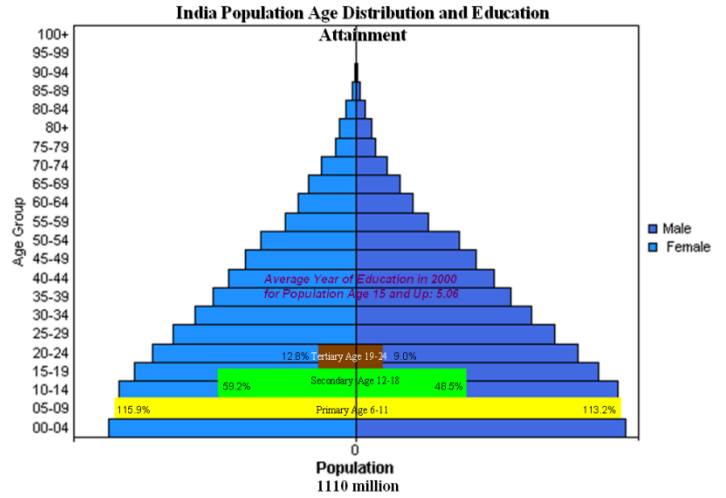
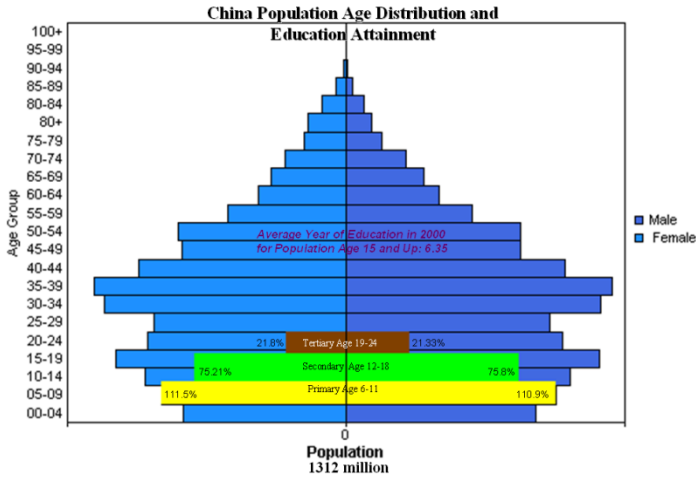
also requires appropriate regulatory, finance and information systems and making effective use of ICT to deliver education and training services. To this end, the role of government needs to change from being the controller and main provider to architect, coordinator, facilitator, integrator, monitor, innovator, and quality assessor. It can help set the regulations, the rules of the game, the standards of quality, and the accreditation and monitoring system, making sure that the system works efficiently. Meanwhile, the private sector, intermediaries, and NGOs need to be fully mobilized to provide multiple pathways to lifelong learning. The example of what was done by the India ICT industry in attacking the problems of quality of the educational system is very instructive in this regard. This needs to be replicated for other areas.

6.129 In conclusion the South Asia region faces many challenges in sustaining its growth and even more in improving growth with equity, particularly given its rapidly growing population. The service sector has contributed more strongly to growth than to employment. The rapidly growing high skilled service sector can only provide employment to a very small percentage of the growing labor force. The ICT sector in India appears to be on its way to releasing the supply constraint of quality higher education. While higher education is very important for competing in today's ever more demanding knowledge economy, it is not enough.

6.130 The comparison in the development strategy of India and China suggests that sustaining high growth also requires making significant improvements across the board in education. Better education more generally can help South Asia leverage its large and growing population into a source of wealth and competitiveness. It can enable it to participate not just in information-enabled service, but also to take advantage of globalization and the two unbundlings to participate more effectively in trade in goods as well. Furthermore, improving education in general and higher education in particular, can help to make more effective use of the rapidly expanding stock of global knowledge and to improve productivity and raise welfare. The challenges are great but so are the opportunities and the potential rewards.

6.131 The South Asian countries therefore face a large challenge in improving education and training at all levels. This is challenging but not impossible. China has shown what can be done. South Asia can do as well if not better. South Asia is well positioned given it has some high quality higher education institutions, critical mass in skilled people, and agglomeration and scale economies. Furthermore, the different countries know what needs to be done. It requires commitment, undertaking some politically difficult decisions, and developing better governance and information systems. It also requires reforming other policies and institutions. All this is within their grasp. The only thing holding them back is their own policies and institutions. Hopefully this chapter can stimulate more awareness and lead to concrete actions to improve the situation.

Figure 6.2: Population Structure and Enrollment Rates Selected Countries 2005



ANNEX A. A.T. KEARNEY LOCATION INDEX

Category	Sub-categories	Metrics
Financial attractiveness (40%)	Compensation costs	<ul style="list-style-type: none"> • Average wages • Median compensation costs for relevant positions (call-center representatives, BPO analysts, IT programmers and local operations managers)
	Infrastructure costs	<ul style="list-style-type: none"> • Rental costs • Commercial electricity rates • International telecom costs • Travel to major customer destinations
	Tax and regulatory costs	<ul style="list-style-type: none"> • Relative tax burden • Corruption perception • Currency appreciation or depreciation
People and skills availability (30%)	Remote services sector experience and quality ratings	<ul style="list-style-type: none"> • Size of existing IT and BPO sectors • Contact center and IT center quality certifications • Quality ratings of management schools and IT training
	Labor force availability	<ul style="list-style-type: none"> • Total work force • University-educated work force • Work force flexibility
	Education and language	<ul style="list-style-type: none"> • Scores on standardized education and language tests
	Attrition risk	<ul style="list-style-type: none"> • Relative IT and BPO sector growth and unemployment rates
Business environment (30%)	Country environment	<ul style="list-style-type: none"> • Investor and analyst ratings of overall business and political environment • A.T. Kearney Foreign Direct Investment Confidence Index™ • Security risk • Regulatory burden and employment rigidity • Government support for the information and communications technology (ICT) sector
	Infrastructure	<ul style="list-style-type: none"> • Overall infrastructure quality • Quality of telecom, Internet, and electricity infrastructure
	Cultural exposure	<ul style="list-style-type: none"> • Personal interaction score from A.T. Kearney Globalization Index™
	Security of intellectual property (IP)	<ul style="list-style-type: none"> • Investor ratings of IP protection and ICT laws • Software piracy rates • Information security certifications

Source: A.T. Kearney (2007).

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7. SOUTH ASIAN TELECOMMUNICATIONS DEVELOPMENT AND THE ROLE OF REGIONAL COOPERATION

Caroline Cecot and Scott Wallsten*

A. INTRODUCTION

7.1 Telecommunications is universally recognized as a crucial component of a country's infrastructure. Competition, resulting from both technology and institutional reforms that reduced entry barriers, has yielded tremendous investment in telecommunications networks around the world. This investment, in turn, has led to marked improvement in the well-being of hundreds of millions, if not billions, of people who even a decade ago had little or no access to even a payphone. This chapter focuses on telecommunications in South Asian countries and the potential and reality of regional cooperation in the sector.

7.2 Scholars and policymakers alike intuitively believe that improved telecommunications infrastructure is a crucial component of economic development. Because income and telecommunications development are endogenous, however, a positive correlation between GDP and any measure of telecommunications does not demonstrate how—or even whether—telecommunications contributed to development. Research is beginning to confirm that while GDP is, indeed, probably the most crucial determinant of investment in telecommunications, telecommunications investment also contributes to GDP growth. Roller and Waverman (2001), for example, find a significant causal link from telecommunications to GDP among OECD countries. They note, however, that this positive effect seems to be most pronounced once penetration is nearly universal. They warn that “non-OECD countries might only realize significant growth effects if a relatively large improvement in communications infrastructure is undertaken.”

7.3 Most countries in South Asia are not even remotely close to universal access, so we are unlikely to observe an effect of telecommunications on an indicator as broad and as poorly measured as GDP. Nevertheless, other research shows benefits of connectivity on a more microeconomic scale. Clarke and Wallsten (2006), for example, find that higher Internet penetration in a developing country increases trade with developed countries, even controlling for the endogenous nature of telecommunications development. That is, higher Internet penetration appears to facilitate trade with countries that already have high Internet penetration, but not with other developing countries. Similarly, Clarke (2008) revisits the issue using a panel of firm-level data in Eastern Europe and Central Asia and finds that firms connected to the Internet were more likely to export than firms that were not connected, even after controlling for the firm's

*Cecot is a PhD-JD candidate at Vanderbilt University. Wallsten is vice president for research and a senior fellow at the Technology Policy Institute. They thank Stephanie Hausladen and Piotr Pilarski for valuable research assistance. Any opinions and mistakes are solely those of the authors.

choice to connect to the Internet. It seems reasonable to assume, therefore, that better access to telecommunications would, at a minimum, aid the ability of firms in South Asia to export, thereby promoting economic growth.

7.4 Policies that promote competition within a country are the most well-established ways of promoting telecommunications development. The regulatory environment, in particular, is crucial. Wallsten (2005) finds that entry and price regulations can hamper Internet development in poor countries. Certain types of regulations are better able to attract investment and growth in the telecommunications industry. Kessides (2004) discusses the importance of best-practice regulations, which include expressing the regulator's mandate in statutory law in order to reduce the chances of subjecting the regulator to volatile short-term political pressures, and a commitment to promoting competition.

7.5 There is no lack of advice on the best institutional structure for a new regulator. Many argue that a regulatory body should be independent, transparent, accountable, and adequately staffed.¹ Some of this advice is indisputable. Clearly, any government agency should be transparent, accountable, and competent. However, it is much more difficult to know precisely what transparency means in practice and how best to hold the regulator accountable. For example, should an aggrieved party be able to appeal directly to a court or should it go through a round of appeals at the regulatory body? And if the courts are involved, how effective and transparent are they? In addition, while the independence of the regulator has become nearly an article of faith, little research to date has demonstrated that independence, per se, matters. In the first place, "independence" can be defined many ways. For example, does the regulator rely on the government for its budget or does it raise its own revenues? Raising its own revenues may contribute to its independence, but relying on industry fees can encourage the regulator to require license fees simply to fund itself, potentially imposing costs or entry barriers. Similarly, should the country's chief executive or legislative body be able to remove the regulator and if so, under what circumstances? On the one hand, such ability may make the regulator subject to short term political pressures. On the other hand, in a democracy it is not obvious that a governmental agency should be completely separate from elected officials who, presumably, represent the people's will in some form.

7.6 Of course, in addition to institutional details, regulatory rules can matter a great deal. Rules can encourage competition by liberalizing international gateways, for example, making it easy to obtain licenses, and allocate spectrum in ways that allow it to be used for high-value services.²

7.7 Other factors, such as the degree to which foreign ownership is allowed, are also likely to be important, especially in very small countries that may not be large enough to support many indigenous firms. It is in part for this reason that regional cooperation is so appealing, in principle. Small countries can pool resources—investment and

¹ See Noll and Wallsten (2004) for a more detailed discussion of these elements.

² People often interpret the phrase "high-value services" to mean services like wireless broadband. In some cases that may be true, but in some cases it may mean lower-tech devices, such as additional cellular voice and SMS services.

regulatory—to overcome disadvantages of a small market. In reality, however, successful regional telecommunications efforts are rare, in part because the political economy does not typically support sustainable real initiatives and in part because the potential economies may not be as large as advertised.

7.8 In the next section, we present an overview of telecommunications in South Asia, and then discuss each market separately. We then proceed to discuss the evidence of regional initiatives, and finally, conclude.

B. OVERVIEW OF THE SOUTH ASIAN TELECOMMUNICATIONS MARKET

7.9 Although South Asian countries differ significantly in many respects, the region includes some of the world’s poorest, densely populated, and under-developed countries. The telecommunications sector reflects this makeup.³ Table 7.1 summarizes some basic economic and telecommunications indicators and demonstrates the range of telecommunications development. The Maldives, the smallest country, has the highest GDP per capita as well as the highest number of telephone subscribers per capita, with about 90 percent of subscribers using mobile cellular. At the other end of the spectrum, Nepal, the poorest country as measured by GDP per capita, has only six telephone subscribers per 100 people. The largest country, India, has about 20 telephone subscribers per 100 people, approximately the regional median. In all countries, more subscribers use mobile cellular telephony than fixed-line telephony.⁴

Table 7.1: Basic Economic and Telephone Indicators by Country, 2007

Country	Population (in millions)	Population density (in km ²)	GDP per capita (year 2006\$)	Total telephone subscribers (in 1000s)	Telephone subscribers per 100 people	Percent using mobile cellular
Afghanistan	31.06*	43	800	4749	18	98%
Bangladesh	158.66	1102	404	35557	22	97%
Bhutan	0.87	23	1121	179	21	83%
India	1169.02	369	813	272870	23	86%
Maldives	0.31	1025	3107	351	115	91%
Nepal	28.20	199	271	1769	6	65%
Pakistan	163.90	204	815	83793	51	94%
Sri Lanka	19.30	294	1289	10726	56	74%

Notes: Data from the ITU World Telecommunication Regulatory Database, except in the case of GDP per capita for Afghanistan, which was unavailable. We use the GDP per capita for Afghanistan from the CIA World Fact Book for 2007.

³ There is some controversy about exactly which countries to include in the region known as South Asia. We use the World Bank’s categorization, which includes Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. We focus on telephone and Internet use; radio and television are also components of telecommunications but are not the focus of this study.

⁴ Building mobile cellular networks requires lower initial investments than does building fixed-line networks. Andonova (2006) also finds that mobile technology is less dependent on institutional characteristics, making it more likely to develop even in poor institutional settings.

7.10 This snapshot, however, masks differing levels of telecommunications development within countries. In all countries, rural telephone subscribership is lower than in urban areas and sometimes almost nonexistent. Table 7.2 summarizes the percentage of households in Bangladesh, India, Nepal, and Pakistan that own a telephone according to the Demographic and Health Surveys (DHS) for 2006. In Pakistan, rural ownership is about half of urban ownership, while the difference is much larger in the other three countries for which we have data.⁵ Telecommunications in rural areas is problematic because the majority of the population in South Asian countries resides in rural areas. In addition, these data provide no information on issues such as quality of service, which may be low.

Table 7.2: Urbanization and Telephone/Computer Ownership 2006

Country	Percent Urbanization	Telephone Ownership, by Household			Computer Ownership by 100 People
		Urban	Rural	Total	
Afghanistan	21%	-	-	-	0.32
Bangladesh	26%	15.6	1.8	4.8	2.42
Bhutan	31%	-	-	-	1.95
India	29%	36.3	7.4	16.8	2.76
Maldives	35%	-	-	-	20.08
Nepal	16%	22.5	2.1	5.5	0.49
Pakistan	35%	65.9	35.2	45.7	0.52
Sri Lanka	15%	-	-	-	3.54

Notes: Percent urbanization and computer ownership from ADB (2008). Data for Pakistan, Nepal, and Sri Lanka is from 2005, and data for Bhutan is from 2007. Telephone ownership data from the Demographic and Health Survey (DHS). Data for Bangladesh is from the 2004 survey. Data is for “telephone” ownership in Bangladesh and Pakistan and “mobile telephone” ownership in India and Nepal

7.11 Internet, and particularly broadband, deployment is low. Table 7.3 summarizes basic statistics for 2007. The Maldives and Pakistan, leaders in the region for Internet deployment, have little more than two subscribers per 100 people. The rates for broadband subscribership are lower, with all countries except the Maldives averaging less than one subscriber per 100 people. As with telephones, rural Internet penetration rates are even lower.

7.12 Several factors account for these low penetration rates. Most importantly, these countries are generally quite poor, reducing demand for communications services and especially for advanced services. Table 7.4 summarizes the electrification and literacy rates in the region, demonstrating the low level of general development and likely demand. In addition, as Bosworth and Maertens discuss in chapter 2, rapidly growing service industries, which make up the demand for advanced telecommunications, rely on relatively highly educated workers, which are in limited supply in much of South Asia. In fact, they find that the average literacy rate is lowest of any major geographic area, which can slow the growth of telecommunications.⁶

⁵ Computer ownership is even more unevenly distributed. The 2006 DHS survey for Nepal and India records that 8 percent of urban households own a computer, compared to only about 0.6 of rural households. Computer ownership per 100 people is summarized in Table 9.2.

⁶ For a more detailed discussion on the link between education and the rise of IT-enabled service exports

Table 7.3: Basic Internet and Broadband Indicators by Country, 2007

Country	Internet subscribers (in 1000s)	Internet subscribers per 100 people	Internet users (in 1000s)	Internet users per 100 people	Broadband subscribers (in 1000s)	Broadband subscribers per 100 people
Afghanistan	50	0.18	580	2.14	0.50	0.00
Bangladesh	150	0.10	500	0.32	-	-
Bhutan	10	1.15	40	4.60	-	-
India	13490	1.15	200000	17.11	3130.00	0.27
Maldives	6	2.03	33	10.80	4.70	1.57
Nepal	67	0.24	337	1.20	-	-
Pakistan	3500	2.14	17500	10.68	128.70	0.08
Sri Lanka	202	1.05	772	4.00	63.30	0.33

Source: ITU World Telecommunication Regulatory Database.

Table 7.4: Infrastructure Barriers in South Asia, 2005

Country	Electricity Consumption (billion kWh) ¹	Electricity Consumption per Capita	Electrification Rate %	Literacy Rate ³ %
Afghanistan	0.80	25.12	7.0	28.1
Bangladesh	19.49	129.55	32.0	43.1
Bhutan	0.38	163.24	-	47.0
India	488.50	432.35	55.5	61.0
Maldives	0.16	506.45	-	96.3
Nepal	1.96 ²	67.82	33.0	48.6
Pakistan	67.06	407.06	54.0	49.9
Sri Lanka	7.07	337.95	66.0	90.7

¹ Electricity consumption is from the CIA World Fact Book (2007). Electrification rate is from the International Energy Agency.

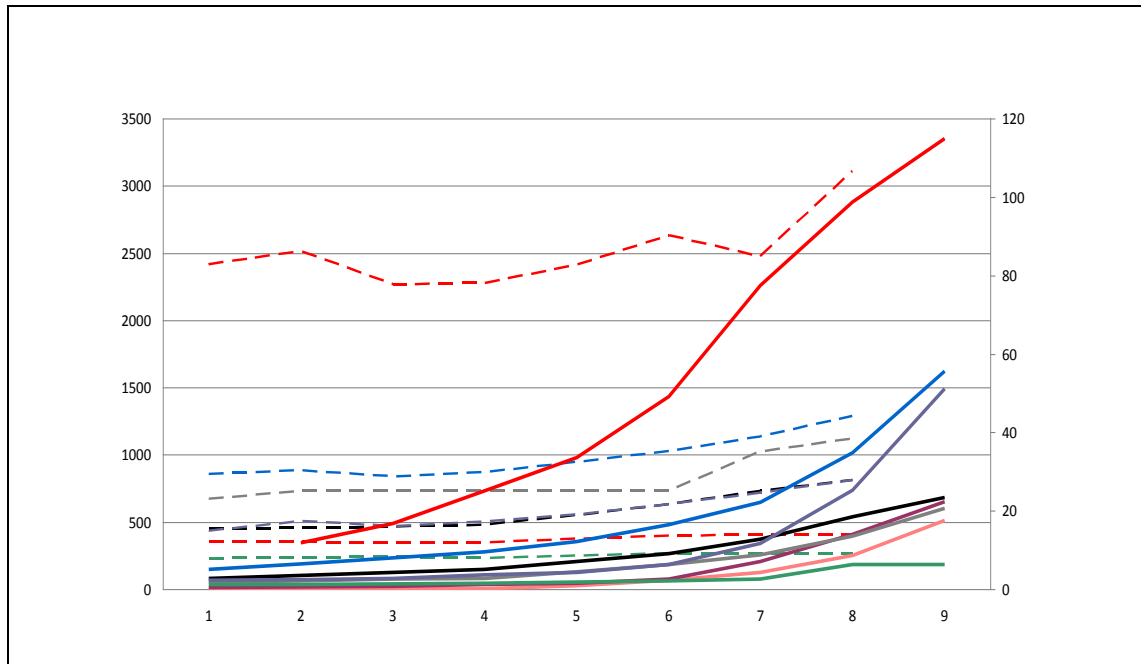
² The electricity consumption total for Nepal is from 2006.

³ The literacy rate is the total population rate. In general, the rates for men are higher, the rates for women are lower than the average.

7.13 Although not apparent from the low rates of telecommunications deployment, much progress has been made in the region over the last decade in at least some countries. Figure 7.1 plots the total telephone subscribers per 100 people for each country in the region from 1999 to 2007. Figure 7.1 also plots the GDP per capita for each country as a reference point. Maldives, Sri Lanka and Pakistan have made great progress over the last decade, especially in the last few years. While wealth plays a role, Figure 7.1 demonstrates that, despite relatively constant GDP per capita, a few countries have managed fast growth in telecommunications.

from South Asia, see chapter 6 in this report.

Figure 7.1: Telephone Subscriber per 100 Inhabitants (with GDP per Capita): 1999-2007



¹ Telephone subscribers per 100 people in solid bold colors; GDP per capita in dashed light colors. Key: Afghanistan **orange**, Bangladesh **brown**, Bhutan **grey**, India **black**, Maldives **red**, Nepal **green**, Pakistan **purple**, and Sri Lanka **blue**.

² The left-vertical axis measures GDP per capita. The right-vertical axis measures total telephone subscribers per 100 people.

³ GDP per capita for Afghanistan was omitted because of inconsistencies in the data from the ITU database and other sources.

Source: Data from the ITU World Telecommunication Regulatory Database.

7.14 Eliminating barriers to entry is also important. Afghanistan imposes no limitations on any telecommunications providers or operators; in contrast, Nepal and India only allow up to 80 percent and 74 percent foreign ownership of operators and providers in most services. We discuss these limitations in more detail in the country-level analysis for those countries.

7.15 Promoting competition is especially crucial to spurring investment in telecommunications. Competition brings lower prices and more services. Table 7.5 shows our index of competition in each country, created using information from the ITU. Although crude, the index provides an overview of the degree of liberalization in each country. According to this index, India and Pakistan have, on paper, the most competitive overall telecommunications framework in the region. Pakistan, especially, has over 100 different service providers, with services ranging from fixed long distance to wireless broadband. In contrast, the telecommunications market in the Maldives is the least liberalized with monopoly control of local services and national and international fixed long distance services and partial competition in all other available services. Sri Lanka is a close second with monopoly control of local services and international fixed long distance services and partial competition in all other available services.

Table 7.5: Level of Telecommunications Competition in South Asia

Country	Number of operators/ service providers	Level of competition (0-2)	Above/below regional average (1.33)
Afghanistan	2	1.08	Below
Bangladesh	8	1.25	Below
Bhutan	1	1.33	At
India	51	2	Above
Maldives	1	0.7	Below
Nepal	37	1.47	Above
Pakistan	134	2	Above
Sri Lanka	20	0.89	Below

¹ ITU's classified various telecommunications services as being fully competitive, partially competitive, or monopolistic for each country. A list of ITU services is in (4).

² We assigned "full competition" a value of 2, "partial competition" a value of 1, and "monopoly" a value of 0, in order to calculate a competition index between 0 and 1, where 0 represents monopoly in all available services and 2 represents full competition in all available services. We do not count unavailable services.

³ Data is from 2007, except for Afghanistan, Bangladesh, and India where data is pre-2007.

⁴ Services are: Local services, domestic fixed long distance, international fixed long distance, wireless local loop, data, DSL, cable modem, VSAT, leased Lines, fixed wireless broadband, mobile, paging, cable TV, fixed sat, mobile sat, GMP CS, IMT 2000, Internet services, and international gateways. See country-level analysis for the level of competition in the services individually.

Source: Authors' calculations, using the ITU World Telecommunication Regulatory Database.

7.16 The tables implicitly demonstrate that factors other than the official regulatory framework affect deployment of telecommunications services. The Maldives and Sri Lanka have some of the highest rates of telecommunications penetration in the region despite the lack of competition. Although an open regulatory environment and increased competition generally stimulate telecommunications deployment, it is important to remember that other factors seemingly unrelated directly to telecommunications such as wealth, human capital, and even geography can affect investment. In the following section we discuss each country in more detail.

C. COUNTRY-LEVEL MARKET ANALYSIS

7.17 The diverse nature of South Asian countries makes it difficult to draw general conclusions. This section briefly discusses the regulatory environment of each country individually.

Afghanistan

7.18 In addition to being quite poor, with a GDP per capita of about \$800 in 2006, Afghanistan has been politically volatile in the last few decades. Its infrastructure in particular is very poor. As demonstrated in Table 7.3, only about seven percent of the population has access to electricity and only about 28 percent are literate. It has only 18 telephone subscribers per 100 people and a negligible number of Internet subscribers.⁷ About 98 percent of those with access to telephone services rely on mobile services.

⁷ In general, telecommunications statistics are from the International Telecommunication Union, available at <http://www.itu.int>, unless otherwise noted.

7.19 The Afghanistan Telecom Regulatory Authority (ATRA) was established in 2005.⁸ ATRA's mission is to "facilitate the rapid development of affordable, high quality telecom services to the entire population of Afghanistan" through a transparent regulatory environment that encourages private participation. Since its inception, ATRA has worked to privatize the incumbent service providers and to license new entrants in order to increase competition. Afghan Telecom, the main telecommunications company is now partially privatized, with the government retaining 20 percent ownership. Accordingly, the ITU now considers Afghanistan to be at least partially competitive in all available services, which include domestic and international fixed long distance, wireless local loop, VSAT, leased lines, mobile, cable TV, fixed satellite, GMP CS, Internet services, and international gateways. Afghanistan is fully competitive in local fixed telephone services.

7.20 Certain aspects of regulation are relatively transparent. For example, interconnection agreements and prices, defined as the technical and commercial arrangements under which service providers gain access to customers, are publicly available, as are licensing agreements and spectrum information.⁹ According to the ITU, ATRA plans to issue additional licenses in the future. The government also encourages foreign investment in the sector by allowing 100 percent foreign ownership for facilities-based and spectrum-based operators, local, long distance, and international service operators, and value-added service operators and issuing laws protecting private investment. Although Afghanistan's telecommunications sector is still underdeveloped, Figure 7.1 demonstrates a marked increase in telephone subscribers in Afghanistan since 2005. Internet and broadband subscribership is low, however, and individual users are not allowed to make voice over IP phone calls.

Bangladesh

7.21 Bangladesh is one of the poorest countries in the region with about \$400 GDP per capita and is the most densely populated country in the region, with over 1,000 people per square kilometer. About a third of the population has access to electricity, and less than half of the population is literate. Not surprisingly, Bangladesh has low telephone subscribership and almost non-existent Internet subscribership. About 97 percent of those with access to telephone services rely on mobile services.

7.22 The Bangladesh Telecommunication Regulatory Commission (BTRC) was established in 2001.¹⁰ Its mission is to "facilitate affordable telecommunication services...for all..." The BTRC has liberalized many telecommunications service areas including local services, domestic fixed long distance, data, DSL, VSAT, mobile, and Internet services. International fixed long distance, paging, fixed satellite, and international gateways remain under monopoly control. Bangladesh is also making

⁸ See the Afghanistan Telecom Regulatory Authority website, <http://www.atra.gov.af>. See also the ICT Regulatory Decisions Clearinghouse, an online resource that provides decisions by telecommunications regulators, among others, <http://www.ictdec.org/>.

⁹ For a discussion of interconnection agreements in India versus other countries, see Jasuja and Agrawal (2002).

¹⁰ See the Bangladesh Telecommunication Regulatory Commission website, <http://www.btrc.gov.bd>.

licensing agreements and spectrum information publicly available on the BTRC website and strengthening its overall regulatory capacity under the supervision of the World Bank.¹¹ Many advanced services such as broadband and voice over IP telephony are not yet generally available, and neither the regulator nor the companies make interconnection agreements and charges publicly available.

7.23 Since 2005, Bangladesh has seen some improvement in telecommunications penetration, but penetration has grown more slowly than some other countries in the region, such as Pakistan.

Bhutan

7.24 In contrast to Bangladesh, Bhutan has higher per capita income and is more sparsely populated, with about 20 people per square kilometer, though the literacy rate in the two countries is similar. Despite Bhutan's higher relative wealth, telecommunications penetration in Bhutan and Bangladesh is similar. Bhutan has about 20 telephone subscribers and one Internet subscriber per 100 people.

7.25 Bhutan's telecommunications regulatory body, called the Bhutan InfoComm and Media Authority (BICMA), was established in 2000.¹² Though its fixed line services and wireless local loop are still under monopoly control, its data, VSAT, leased lines, fixed wireless broadband, mobile, cable TV, Internet services, and international gateways are, in principle, fully competitive due to deregulation in 2004.¹³ Mobile services were deregulated more recently in 2007. About 80 percent of all telephone subscribers use mobile cellular. Licensing agreements are publicly available, and individual users are allowed to make voice over IP phone calls. Spectrum information and interconnection agreements and charges are not publicly available and broadband Internet service is not yet generally available.

India

7.26 India is the largest country in South Asia in terms of geography and population. India's telecommunications penetration remains low, with only about 20 telephone subscribers per 100 people. While the penetration rate is similar to several other countries in the region India's large population means that total subscribership is still impressive: more than 270 million people are telephone subscribers, and more than 13 million people are Internet subscribers.

7.27 Despite its low overall telecommunications penetration, India has also gained a reputation for a strong information technology market in its urban centers.¹⁴ Many foreign firms outsource components of their business to India, taking advantage of

¹¹ See the project website, available at http://www.btrc.gov.bd/projects/world_bank_funded_projects/overview.php.

¹² See the Bhutan InfoComm and Media Authority's website, <http://www.bicma.gov.bt>.

¹³ DSL and 3G services are to be provided in 2008 by incumbent BTL.

¹⁴ The overall rate is so low because of the low penetration of telecommunications services into rural markets.

India's highly-skilled and cheap labor force and making Indian call centers increasingly popular. In 2007 information technology services exports totaled \$18 billion, while the entire information technology industry contributed \$48 billion to GDP.¹⁵

7.28 Two government agencies in India oversee portions of the telecommunications sector. The Telecom Regulatory Authority of India (TRAI) was established in 1997 and re-organized in 2000 to “create and nurture conditions for growth of telecommunications” so that India can emerge as a leader in the global information society.¹⁶ TRAI has opened all available telecommunications services to full competition, and over 50 service providers operate in the country.¹⁷ The foreign ownership cap has also been raised to 74 percent for most services.¹⁸ Two of the four main fixed line operators are fully private.¹⁹ Interconnection charges, licensing agreements, and spectrum information are publicly available. Individual users are allowed to make voice over IP phone calls. Each year, TRAI releases a report on telecommunications developments and recently published a report on its achievements since 1997. In addition to the TRAI, the Ministry of Communications and Information Technology—especially the Department of Telecommunications (DoT) within the Ministry—develops various government initiatives to further increase India's leading position in information technology.²⁰ For example, a 2004 Broadband Policy Initiative set ambitious goals for broadband penetration in India by 2010, although it does not appear that India will meet these goals.²¹

7.29 India is attempting to increase telecommunications deployment into its rural areas where the majority of the population lives.²² India's Universal Service Fund (USF) is intended to reimburse the net cost (cost minus revenues) of providing rural telecom service. Because costs may differ across different types of service and different service segments, separate auctions determine the actual reimbursement to be awarded for each.²³ When awarding licenses for cellular telephone service, the DoT divided the country into twenty telecom “circles” (which loosely follow state boundaries). These circles were used as the basis for geographic reference in the rural subsidy auctions.

¹⁵ See India's National Association of Software and Services Companies (NASSCOM) factsheet, <http://www.nasscom.in>.

¹⁶ See the Telecom Regulatory Authority of India's website, <http://www.trai.gov.in>.

¹⁷ DSL, leased lines, fixed wireless broadband, fixed and mobile satellite, GMP CS, and IMT 2000 are not yet available.

¹⁸ The cap for Internet service provider ownership is 100 percent, according to the ITU.

¹⁹ Reliance and Bharti (AirTel) are private, and BSNL (the incumbent) and MTNL are partially privatized, according to ITU.

²⁰ See the Ministry of Communications and Information Technology's website, <http://www.mit.gov.in>.

²¹ See Noll and Wallsten (2004) and Wallsten (2008) for more on telecommunications in India.

²² The information on reverse auctions and universal service in India comes largely from Wallsten (2008).

²³ According to commentators at the Indian National Council for Applied Economic Research, six auctions have taken place, covering the following six services and service segments: Operation and Maintenance of Village Public Telephones (VPTs) in certain villages (Finalized January 2003); Replacement of Multi Access Radio Relay -based VPTs installed before January 4, 2002 and technology upgrading of existing VPTs (Finalized September 2003); Provision of additional rural community phones in larger villages with at least one VPT (Finalized September 2004); Provision of VPTs in villages that remained uncovered (Finalized October 2004); Installation of High Speed Public Telecom Information Centers (HPTICs) (Not finalized as of this writing); and provision of household telephones in rural and remote areas identified for subsidy support (Finalized March 2005).

7.30 Telecommunications firms submitted bids to provide service. The firm that bid for the lowest subsidy, as long as the bid was no higher than a set benchmark, was eligible to be reimbursed that amount from the fund. Benchmarks were set using information primarily from the incumbent, BSNL. Any firm with a license to provide basic or cellular service in the relevant service area was eligible to bid.²⁴ The winner received a subsidy for seven years, subject to review after three years.

7.31 India held several auctions, each for different types of telecommunications services. The first, in March 2003, was to install village public telephones (VPTs) in 520,000 villages. The second, in September 2003, was to replace about 180,000 Multi-Access Radio Relay-based VPTs. The third, held in September 2004, was to provide additional rural community phones in about 46,000 villages. The fourth, in November 2004, was to install VPTs in the 66,000 villages that had no public telephone facilities. The fifth, in March 2005, was to provide direct rural exchange lines in 227 regions. The most recent auction took place in April 2007 to provide mobile services.

7.32 The auctions yielded dramatically different results. The first two subsidy auctions, relating to Primary VPTs and replacing Multi Access Radio Relay-based VPTs, were disappointing. In nineteen of the twenty circles, only the incumbent, BSNL, bid for the subsidies (Ghosh 2004). Not surprisingly, given the thin market, BSNL bid exactly the benchmark amount, which was the maximum subsidy DoT was prepared to provide. By the final auction, however, some firms even bid negative amounts, demonstrating that they were willing to pay to provide service.

7.33 In September 2004 the government held an auction to provide a second VPT in 300 areas (called secondary switching areas, or SSAs) that already had one. The incumbent BSNL and Reliance Infocomm were the largest winners, and two carriers bid against each other in 115 out of the 300 SSAs. The total subsidy awarded was 17 percent below the benchmark amount.

7.34 A fourth auction in November 2004 was for the obligation to provide VPTs in the remaining 67,000 villages without one. The incumbent BSNL won in all 12 service areas. It faced bidding competition in 3 service areas, and that competition reduced the total subsidy by 15 to 20 percent.

7.35 A fifth auction for subsidies to install rural household phones was concluded in 2005 as a first step toward distributing funds for connecting individual households. This step is potentially more important than the first. Many more telephone lines were at stake in devising a plan for implementing extensive residential access than for providing more public telephones. While even in the best of circumstances firms might not have found subsidies for a relatively small number of public telephones an attractive basis for entering rural areas, subsidies for a much larger number of residential lines clearly are more attractive. Indeed, the 2005 auction generated more interest among private operators, and the bidding reduced subsidies by 60 to 75 percent of the benchmark.

²⁴ See Department of Telecommunications (2002).

BSNL won subsidies for 1,267 Short Distance Charging Areas (SDCAs, the basic service unit identified for subsidies) while two private operators won subsidies for 418 SDCAs.²⁵

7.36 In 2007, the government conducted two auctions for mobile service in 81 “clusters” that include 250,000 villages. The first auction was for the right to build infrastructure that could be used by other firms to provide service. BSNL won 80 percent of the \$570 million to build this wholesale infrastructure. Although BSNL dominated the winning bids, bidding competition reduced the subsidy to 30 percent below the benchmark.²⁶

7.37 The second mobile auction in 2007 was to provide service over this “passive” network. Bidding was so intense that in many cases the winning bid was either zero or negative, meaning the operator was willing to pay the government for the right to provide service.

7.38 These auction results demonstrate strongly that competition for subsidies can bring down the subsidy. Because these appeared to be bids to operate on a network being built by someone else, however, it is unclear why subsidies would be offered in the first place. The government of India apparently decided to separate ownership and operation of the network from service provision. This wisdom of such structural separation is heavily debated and centers on whether consumers are ultimately better off when firms compete by investing in facilities or by offering service over the same facilities. Mandatory sharing of network facilities is likely to lead to more intensive use of those facilities, but can reduce the incentive to invest in the network itself. In this case, we do not know what the bidding might have revealed if firms had bid simply to provide service at the lowest cost.

The Maldives

7.39 The Maldives is the smallest of the South Asian countries, consisting of a series of islands off the coast of India. The Maldives has a much higher GDP per capita than the other countries (about \$3100), almost three times the GDP per capita of Sri Lanka, the second wealthiest South Asian country. In addition, its literacy rate is almost 100 percent, in contrast to the other South Asian countries, where the literacy rate averages 53 percent. Perhaps not surprisingly, in the past decade these advantages have translated into high telecommunications penetration rates. Telephone subscribership in the Maldives has increased from about ten per 100 people in 1999 to 100 in 2007.

7.40 This surge in telecommunications penetration was not sparked by liberalization and deregulation. Local and long distance services are still under monopoly control, and all other available services are at best partially competitive. Dhiraagu, whose right of exclusivity expires in 2009, currently provides all telecommunications services.²⁷ However, the Maldives’ Ministry of Communication, Science, and Technology (MCST)

²⁵ According to comments received from NCAER, December 2005.

²⁶ See *The Hindu* (2007) and *The Hindu Business Line* (2007).

²⁷ See the Maldives Ministry of Communication, Science, and Technology’s website, <http://www.mcst.gov.mv>.

recently promised some form of deregulation in the future, and Dhiraagu is currently partially privatized. In its “Science and Technology Master Plan,” the MCST articulated the following policy decision: “to liberalize (in the immediate future) the market for Internet services and possibly, at a later date, selected other devices not covered by current exclusivity arrangements.”²⁸ Already some deregulation has occurred in Internet and broadband services, making those partially competitive. It is unclear whether the Maldives will move to full competition in those services and whether competition will spread to telephone services.

7.41 In 2003, a separate entity was formed in the Maldives to regulate the telecommunications sector and foster competition in telecommunications services. The Telecommunications Authority of Maldives (TAM) has recently released a policy statement for telecommunications from 2006 to 2010.²⁹ Despite Maldives’ high telephone coverage relative to other countries, there is still room for improvement in Internet and, especially, broadband services. The policy statement sets goals such as implementing one universal tariff for service on all islands, lowering prices, enhancing existing networks, and supplying high-speed Internet services to all by 2010. In addition, the Maldives is expected to make licensing agreements and spectrum information publicly available in the near future.

Nepal

7.42 Nepal is the poorest country in South Asia as measured by GDP per capita. In addition, only a third of the population has access to electricity, and more than half of the population is illiterate. These formidable barriers have made telecommunications deployment in the country very difficult. Perhaps not surprisingly, Nepal has the lowest number of telephone subscribers per 100 people (six), less than one Internet subscriber per 100 people, and broadband is not generally available.

7.43 In 1998, the Nepal Telecommunications Authority (NTA) was established to help foster competition to develop and expand telecommunications services in Nepal.³⁰ The NTA has deregulated most of the available telecommunications services, making all at least partially competitive.³¹ The main fixed line operator, United Telecom Limited, is almost fully privatized. Recently, NTA has allowed IP based voice services to the two international telephone operators. The maximum foreign ownership restriction is 80 percent for all operators, including facilities and spectrum-based operators, local, long distance, and international service operators, value-added service operators, and Internet service providers.

7.44 In 2000 the Nepalese government decided to use a reverse auction process to provide telecommunications service to the 534 village development committees

²⁸ See Chapter 4, of the MCST’s “Science and Technology Master Plan,” available at <http://www.mcst.gov.mv/Downloads/Documents/S&T/Part2-04Telecommunication.pdf>.

²⁹ See the Telecommunications Authority of Maldives’ website, <http://www.tam.gov.mv>.

³⁰ See the Nepal Telecommunications Authority’s website, <http://www.nta.gov.np>.

³¹ Data, cable modem, VSAT, cable TV, mobile satellite, GMP CS, and Internet services are fully competitive, while local services, domestic and international fixed long distance, wireless local loop, leased lines, mobile, IMT 2000, and international gateways are partially competitive.

(VDCs—the second-smallest administrative units in Nepal) that had no such access. Firms were to bid for a one-time subsidy and a 10-year renewable license with a five-year exclusivity guarantee. In exchange they were to provide two public access lines in each VDC. Unlike most reverse auctions, in Nepal the maximum available subsidy was not made public.³²

7.45 Two firms bid in September 2000, but “the security situation” caused the winning firm to back out of its agreement. The regulator, the Nepal Telecommunications Authority, attempted the auction again in 2003 with more success.

7.46 Two firms bid in the 2003 auction, and the winning bidder asked for \$11.9 million to do the project. The winner appeared to be on track to meet its first three rollout agreements by the end of 2004. The company notes that after rolling out service to more than 500 villages in 2004 it now serves “over 1,800 sites” and plans to expand service into western Nepal.³³

Pakistan

7.47 Although Pakistan has 164 million residents, India 1.2 billion, and Afghanistan only 31 million, they share a similar GDP per capita of about \$800. India and Pakistan also share similar access to electricity and literacy rates, and both are fully competitive in all available telecommunications services. Despite these similarities, the two countries have diverged in their telecommunications penetration rates, especially in the last few years. India’s telecom sector has continued to grow steadily, but Pakistan’s has surged. In 2007, Pakistan had over 50 telephone subscribers per 100 people, compared to only about two subscribers per 100 people in 1999.

7.48 In 1997, the Pakistan Telecommunication Authority (PTA) was established “to regulate the establishment, operation and maintenance of telecommunication systems, and the provision of telecom services.”³⁴ Pakistan’s telecommunications sector is fully deregulated, and all available telecommunications services are open to full competition.³⁵ Pakistan’s main fixed line operator, Pakistan Telecom Comp Limited, is partially privatized. Interconnection agreements and charges, as well as spectrum information, are publicly available. Its licensing process is technology neutral, though licensing agreements are not public. Telecommunications investment totaled more than \$4 billion in 2007.³⁶ Telecommunications companies themselves have invested more than \$8 billion during the last four years, mostly in the mobile sector. This large flow of investment into the sector is a large contributor to the rapid growth, despite Pakistan’s low GDP per capita. Cooperation between Pakistan and China has also been helpful in that regard; China Mobile invested \$700 million in 2007 to expand their joint networks.³⁷ In its most

³² Spectrum information is not publicly available.

³³ http://www.stmi.com/index.php?option=com_content&task=view&id=125&Itemid=277.

³⁴ See the Pakistan Telecommunication Authority’s website, <http://www.pta.gov.pk>.

³⁵ Cable modem, paging, fixed and mobile satellite, and IMT 2000 are not available.

³⁶ See PTA’s achievements 2006-07, available at

http://www.pta.gov.pk/index.php?option=com_content&task=view&id=1077&Itemid=671.

³⁷ *Id.*

recent annual list of achievements, the PTA noted that more than 6,000 cities, towns, and villages are covered by mobile operators. In addition, the PTA has already seen some success in its Rural Telephony Project, which aims to increase rural telephone deployment.

7.49 It appears that large foreign investment, the deregulated environment, and the PTA's proactive approach to increasing telecommunications penetration is promoting the rapid growth evident since 2005 despite Pakistan's relatively low GDP per capita and other barriers.

Sri Lanka

7.50 Sri Lanka has the second-highest GDP per capita and the second-highest telephone subscribership with 56 per 100 people in the region. In addition, its industry is advanced relative to other countries in that it has introduced Third Generation (3G) mobile services and a fiber optic cable link with Europe and India.³⁸ Sri Lanka is also planning to launch its first national satellite.³⁹

7.51 The Telecommunications Regulatory Commission of Sri Lanka (TRCSL) was established in 1996 to promote development in the telecommunications industry by ensuring that "competition in the market is open, fair and effective."⁴⁰ The ITU defines the Sri Lankan market, however, as only partial competitive in all available services and with monopoly control in local services and international fixed long distance services.⁴¹ Sri Lanka does, however, make more telecommunications services available in South Asia than any other country (specifically, all services tracked by the International Telecommunications Union except paging). The main fixed line operator, Sri Lanka Telecom, is partially privatized and licensing agreements and spectrum information is publicly available. Interconnection agreements and charges, however, are not publicly available.

Summary

7.52 General measures of telecommunications development, such as total telephone subscribership, are low in most countries in South Asia. The generally poor state of telecommunications in the region has sparked interest in finding cooperative measures that may help promote investment and adoption. The next section describes the role of cooperation in recent years.

³⁸ See the CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/ce.html#Comm>

³⁹ See *Daily Mirror* (Sri Lanka) (2008).

⁴⁰ See the Telecommunications Regulatory Commission of Sri Lanka's website, <http://202.124.172.4/trc3/index.php#>.

⁴¹ Sri Lanka is partially competitive in domestic fixed long distance, wireless local loop, data, DSL, cable modem, VSAT, leased lines, fixed wireless broadband, mobile, cable TV, fixed and mobile satellite, GMP CS, IMT 2000, Internet services, and international gateways.

D. THE ROLE OF COOPERATION

7.53 Partly because of globalization and economic integration, South Asian countries have become increasingly interested in regional cooperation on many issues. The Asian Development Bank (2006) notes that as economies become more integrated, governments are more likely to introduce cooperative measures, making integration and cooperation mutually interactive. In the aftermath of the financial crisis of 1997-1998, for example, Asian governments expressed interest in cooperating to help prevent macroeconomic and financial instability. A large number of free trade agreements have been signed in recent years, including the South Asian Free Trade Agreement (SAFTA), which is expected to be operational by 2016. Increasing trade and investment between neighboring countries can promote interest in cooperation in other areas.

E. REGIONAL TELECOMMUNICATIONS COOPERATION: POTENTIAL BENEFITS AND BARRIERS

7.54 The Asian Development Bank (2006) considers the overall goal of regional cooperation to be poverty reduction. Through that perspective, regional cooperation allows developing countries “greater access to key inputs, resources, technologies and knowledge, and enlarges the market for their products.” Through regional cooperation, less developed economies in a region can take advantage of the resources of the more developed countries. According to the ADB, the more developed countries benefit from cooperation because they can relocate industries requiring less skill to their less developed neighbors by comparative advantage principles and, in the long run, benefit from a more efficient allocation of resources, generating efficient investments.

7.55 Interest in regional cooperation and integration extends to telecommunications. In principle, cooperation can be beneficial. For example, large economies of scale in certain network industries could make it sensible for countries—especially small ones—to work together to achieve those economies. Similarly, very small countries may lack the resources necessary to implement a successful regulatory structure. A regional regulator, as opposed to several national regulators, could allow countries to pool the resources an effective regulator would require.

7.56 The economics of telecommunications are unrelated to political boundaries and are thus also favorable to regional agreements. The marginal cost of voice or data transmissions does not have to increase just because they cross a political border. Just as free trade agreements can lower arbitrary costs of trading, regional cooperation can in principle reduce the costs of telecommunications to consumers if it reduces costs associated with crossing political boundaries.

7.57 Despite these arguments in favor of cooperation, other factors cast doubt on some of the theoretical justifications and on whether real integration is feasible. First, simply because telecommunications networks exhibit economies of scale does not necessarily mean that the optimal scale is larger than a small country can support. Historically, many successful telecommunications companies have been small, challenging the legitimacy of the economies of scale explanation. It remains true,

however, that network effects mean that a small country's telecommunications network will be inherently less valuable on a per-capita (or per-line) basis if it lacks good interconnection agreements with other countries.

7.58 Second, a central, regional regulator may have advantages and disadvantages. A working document from a Connect Africa Summit contends that regional cooperation will lead to harmonized regulations and policies and sharing of best-practices (ITU 2007). It is not clear, however, whether anything in particular about regional agreements creates incentives to create good regulations rather than bad regulations.

7.59 Finally, regional regulatory initiatives can have political economic benefits, but face real political resistance. A regional authority could, for example, provide national policymakers cover to make unpopular, yet economically wise, decisions. Nevertheless, small countries are often reluctant to cede any authority to a regional body for fear of being dominated by their much larger neighbors. At the same time, the very large countries see little to gain by cooperating with countries whose populations are a tiny fraction of their own. It is possibly for this reason that there are few examples of successful regional telecommunications initiatives, as discussed below

F. EVIDENCE FROM OTHER COOPERATIVE VENTURES

7.60 Few examples worldwide of successful regional partnerships have moved beyond the earliest stage of economic integration and eliminated internal tariffs between member nations. Waheeduzzaman (2007) evaluates a range of regional integration groups and finds that only one, the European Union, has accomplished complete economic integration, with no internal tariff, a common external tariff and free factor mobility, and a common monetary and fiscal policy.⁴²

7.61 The only other partnership that has moved beyond the earliest stage of economic integration and created a free trade area is the North American Free Trade Agreement (NAFTA), since it has no internal tariff.⁴³ Waheeduzzaman's analysis puts the incidence of regional cooperation in perspective: true cooperative regional efforts are rare.

7.62 ECOWAS, however, a regional cooperative group founded in 1975, has made some progress in regional telecommunications cooperation. The external impetus for cooperation was the 2004 ITU and EU project to establish an integrated information and communication technology market in West Africa.⁴⁴ After a series of workshops, the ITU and EU finalized guidelines in 2005 based on best practices (ITU/EU 2005). The West Africa Telecommunication Regulators Assembly adopted these guidelines in 2005. The telecommunications committee from ECOWAS used the guidelines to formulate a set of information and communication technology regulatory decisions in 2006. At the 31st session of ECOWAS in 2007, the decisions were adopted as supplementary acts (ECOWAS 2007). The supplementary acts define harmonized regulatory schemes by

⁴² See Waheeduzzaman (2007) for a full discussion of the criteria for various stages of economic integration as well as a classification of a majority of the regional partnerships in the world.

⁴³ For more information on cooperative agreements in Asia, see Song (2005).

⁴⁴ See the ITU's project page, <http://www.itu.int/ITU-D/treg/projects/itu-ec/index.html>.

which member states could “standardize their national telecommunications market... to promote reliable interconnection among [each other]” (ECOWAS 2007). Only two similar binding harmonized regulatory information and communication technology frameworks exist worldwide: the West African Economic and Monetary Union directives and the EU New Regulatory Framework (ITU 2006). ECOWAS anticipates the acts will be used as a model for future cooperative regional groups of developing countries interested in creating a harmonized regulatory information and communication technology framework (ITU 2006).

7.63 The ECOWAS supplementary acts are in the process of being translated into national legal frameworks (ITU 2007). Many ECOWAS member states are already experiencing fast growth in telephone subscribership, attracting more investment to the region (*Vanguard* 2008). In early 2008, Nigeria became Africa’s largest mobile market with more than 45 million subscribers. Cote d’Ivoire’s mobile subscribership increased almost 80 percent to more than 8 million, while Guinea and Guinea-Bissau increased their small subscribership more than 140 percent.

G. EXISTING AVENUES OF COOPERATION: BILATERAL AGREEMENTS, SAARC, AND SASEC

7.64 Cross-border cooperation occurs in two ways. One is through bilateral or multilateral agreements on very specific projects. The other includes official regional cooperation agreements and programs sponsored by multilateral organizations. Official, high-level regional agreements receive the most attention, but have yielded the fewest results. By comparison, bilateral and multilateral project-based agreements have a better track record of success. For example, Bhutan received an optical fiber cable connection to the London Internet Exchange through Mumbai, India.⁴⁵ Most recently, Pakistan was considering linking with China, India, Afghanistan, and Iran through a fiber optic connection.⁴⁶ Unfortunately, these agreements are limited and, because they typically lack a high-profile sponsor, difficult to identify.

7.65 Larger cooperative regional agreements receive far more attention, but have few concrete results. In December 1985, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka established the South Asian Association for Regional Cooperation (SAARC) with the aim of facilitating the process of economic and social development in its member states.⁴⁷ With the addition of Afghanistan at the Association’s 14th summit in April 2007, SAARC became an eight-member economic and political organization representing approximately 1.5 billion people, larger than any other regional trading block in the world.

⁴⁵ See Kuensel Online (Bhutan) (2008).

⁴⁶ See the Pakistan Daily (2008). Other examples of regional cooperation, not related to telecommunications, include Sri Lanka and Pakistan signing a free trade agreement (Associated Press of Pakistan, 2008), and India and Pakistan agreeing to try to increase their trade with each other to \$10 billion by 2010 (PTI News Agency (India), 2007).

⁴⁷ See the SAARC website, <http://www.saarc-sec.org/main.php>. SAARC is one of the more than 13 regional “cooperation” groups Waheeduzzaman (2007) classified as being at the lowest level of economic integration, with no serious tariff reduction.

7.66 To accelerate sustainable economic development, four of the SAARC member states—Bangladesh, Bhutan, India, and Nepal—formed their own regional cooperative block, the South Asian Growth Quadrangle (SAGQ) in 1996.⁴⁸ SAARC approved subregional cooperation among its member states at its 9th summit in May 1997, recognizing that competing interests among member states in the region and political tensions between some member states were hampering cooperation efforts. Monetary and human resource support for SAGQ came in 2001 from the South Asia Subregional Economic Cooperation (SASEC) program, which was launched with assistance from the Asian Development Bank.⁴⁹

H. SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION: LOTS OF TALK, LITTLE PROGRESS

7.67 From its inception, SAARC designated telecommunications as one area of cooperation, although consensus on how to achieve cooperation did not come until May 1997 at the Association's 9th summit.⁵⁰ There, representatives of member states noted that poor telecommunication systems were preventing close cooperation.⁵¹ Communications ministers were appointed and charged with the responsibility of drafting a telecommunications development plan that stressed cooperation in the development of infrastructure and communications networks among member states.

7.68 At their first conference in May 1998, SAARC's communication ministers adopted a plan of action on telecommunications. The plan was revised at the second conference in June 2004 in light of further developments in the telecommunications sector. The goals of the SAARC revised plan of action on telecommunications included promoting cooperation, minimizing disparities within and among members states in telecommunications, using telecommunications for economic development, and developing a coordinated approach on international telecommunications issues.

7.69 The revised plan of action reflected a push by member states towards general liberalization of telecommunications services, prioritizing universal access, affordable rural services, and real incentives to providers to achieve the plan of action's goals.⁵² The most notable point in the plan of action is a joint member state promise to reduce telecommunications tariffs within the SAARC region to the lowest extent feasible within the framework of cost orientation. The revised plan of action also called on countries to increase efforts to use regional telecommunications hubbing and transit facilities for long-distance telephone communication, develop infrastructure and services that could assist travelers and entrepreneurs using cellular services, promote telecommunications

⁴⁸ See ADB (2006) for more background on regional cooperation efforts in South Asia, including the formation of the SAGQ and SAARC's approval of the SAGQ as a subregional cooperative block.

⁴⁹ The SASEC program was undertaken by the SAGQ with assistance from the ADB; to avoid confusion, from this point forward we use "SASEC region" to refer to the SAGQ and its member countries: Bangladesh, Bhutan, India, and Nepal.

⁵⁰ See the telecommunications section of SAARC's website, <http://www.saarc-sec.org/main.php?t=2.3>. The website was the source for all details summarized in this section, unless otherwise noted.

⁵¹ See the telecommunications section of the SAARC website, <http://www.saarc-sec.org/main.php?t=2.3>.

⁵² See the "SAARC Revised Plan of Action," available on SAARC's website, <http://www.saarc-sec.org/main.php?t=2.3.10>.

research and development, share telecommunications expertise, and enhance and better use and share existing training facilities in order to develop human resources in the telecommunications sector.

7.70 Additionally, the revised plan of action notes the need for cooperation among regulatory authorities and administrations in the effort to increase the telephone density in the region and access to information and communication technologies (ICT) at affordable tariffs, naming e-commerce, health care, and education as services that require particular ICT investment.

7.71 Further reflecting the growing importance of telecommunications in the SAARC's cooperative agenda, a working group on telecommunication and ICT was created after the Association's 12th summit in January 2004. The task of developing performance indicators for the successful development and dissemination of ICT in the region was assigned to the working group. The working group has convened once since its inception in September 2004.

7.72 A third conference of the SAARC communications ministers was to feature an exhibition of ICT products developed and manufactured in the region. The conference was planned for early 2005, but has yet to occur.

7.73 A repeated declaration for the need for closer regional cooperation in the ICT sector was made by member states at the Association's 14th summit in April 2007.⁵³ Nonetheless, examples of cooperation have been largely limited to meetings and declarations. For example, despite six consecutive meetings of the CEOs of ICT service providers and regulators from the SAARC region at the annual Voice and Data CEO Conclaves, cellular service roaming charges in the region remain among the highest in the world (Parbat and Philip 2007).

7.74 Notably, the 6th Voice and Data CEO Conclave, held in December 2007, hosted the first summit of the SAARC Telecom Advisory Council (STAC), which drew up a roadmap for telecommunications in the region for 2008 and beyond (Swain 2007).⁵⁴ The STAC summit identified challenges that operators in the SAARC region face with respect to taking telecommunications growth to semi-urban and rural markets, the main agenda of this most recent CEO Conclave (Swain 2007). In addition, the STAC summit brainstormed country-specific strategies for operators to address challenges in telecommunications; assessed the preparedness of operators to implement these strategies in terms of technologies, regulations, infrastructure, and revenue models; and discussed the support that operators require from each other in the SAARC region (Swain 2007).

7.75 Despite SAARC's and the CEO Conclave's shared goals of increasing telecom penetration, quality of service, adoption of new technology, and affordability in the region, however, little reportable progress has been actually made on these fronts.

⁵³ See the "New Delhi Declaration of the 14th SAARC Summit," available on SAARC's website, <http://www.saarc-sec.org/data/summit14/ss14declaration.htm>.

⁵⁴ See the Voice and Data CEO Conclave website for more information on the 5th and 6th CEO Conclaves, <http://voicendata.ciol.com/content/CEOConclave/default.asp>.

I. SOUTH ASIA SUBREGIONAL ECONOMIC COOPERATION

7.76 As with SAARC, information and communication technologies were designated one of six priority sectors of cooperation under the SASEC program, but no work began on the issue until the second phase of the program, in October 2002.⁵⁵

7.77 The first meeting of the SASEC information and communication technologies (ICT) working group was held in March 2004 to develop a cooperation agenda, discuss major issues and activities for ICT development in the region, and identify priority areas from the developmental master plan.⁵⁶ Lack of connections between SASEC member countries was identified as a major contributing factor to the high cost and low penetration of telecommunications services in the sub-region. Likewise, the lack of strong infrastructure and low human capital development in the telecommunications sector were identified as major barriers to regional cooperation. To diminish these barriers, the SASEC ICT working group identified five areas of focus for the sub-region's ICT sector: enhancement of regional connectivity, establishment of community information centers, promotion of information sharing and human resources development in the ICT sector, strengthening and harmonization of regulations and standards in the ICT sector, and development of common software tools to enhance content available on the Internet.

7.78 ADB demonstrated its ongoing support for the SASEC ICT working group's activities by approving a \$450,000 project preparatory technical assistance instrument designated towards creating a SASEC ICT developmental master plan (ADB 2005).

7.79 Within a year, the ICT working group's pilot project, which called for the development of approximately 20 "Community e-Centers" in rural areas of the SASEC region, was approved and launched with \$1 million in financing from the Japan Fund for Information and Communication Technology (JFICT) and \$200,000 in financing from the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) (ADB 2005). The goal of the Community e-Centers project is to increase community level productivity and profitability, improve the capacity of the local government and rural community to use ICT, and evaluate the impact of the e-centers on rural development. The project was implemented in September 2005 and was to be completed in February 2008, and an evaluation study of the impact of the e-Centers is due. Upon evaluation, best practices from the initiative will be replicated to the ICT working group's national e-center initiative in cooperation with other development partners.

7.80 A milestone in the region's telecommunications cooperation was achieved in August 2007 when the four member countries of the SASEC sub-region jointly agreed on the "SASEC Information Highway Project" (ADB 2007a). The overall goals of the SASEC Information Highway Project are to create economic opportunity, facilitate trade

⁵⁵ See ADB (2006) and the SASEC program website, <http://www.adb.org/SASEC/default.asp> for more information on the SASEC program and its priority sectors of cooperation. Information from ADB (2006) and the SASEC program website will be the main sources for this section, unless otherwise noted.

⁵⁶ See ADB (2004) for full proceedings of the 1st meeting of the SASEC ICT working group.

and investments, encourage regional cooperation and integration, and extend the reach of public and private services to rural communities deprived of access to goods, services, markets, and information (ADB 2007b). Existing Internet traffic in South Asia goes through third parties and often depends on satellite transmission; once developed, the SASEC Information Highway Project is intended to render third party connections unnecessary, optimize the costs of interconnection in the region, drive down prices for ICT services, and boost ICT use across borders (ADB 2007b). Moreover, the Project also hopes to bridge the ever-widening rural-urban divide in ICT that has exacerbated the disparities between rural and urban areas, accomplishing goals set out by both the SASEC program and SAARC (ADB 2007b).

7.81 The project calls for the development of a SASEC regional network with fiber-optic and data interchange capacity to directly connect the four member countries and decrease Internet costs; building of a SASEC village network that will expand broadband wireless connectivity to 110 rural communities, enabling them to access services such as telemedicine, distance learning, and e-government services; and creation of the SASEC regional research and training network that will link communities, businesses, and research institutes in member countries and facilitate the movement of information, knowledge, and services among them (ADB 2007a).

7.82 ADB approved a \$500,000 project preparatory technical assistance instrument designated towards creating a development plan for the project in November 2006 (ADB 2007a). In December 2007, ADB made the landmark decision to provide \$21.2 million in funding for the development of the SASEC Information Highway Project upon review of the proposal (ADB 2007b). The \$24 million project will be financed by a \$4.7 million grant to Bhutan, a \$9 million grant to Nepal, and a \$3.1 million loan to Bangladesh, each provided by ADB (ADB 2007b). The remaining \$7.2 million of costs will be borne by the governments of the four member countries of the SASEC program (ADB 2007b). An additional \$4.4 million grant will be provided by ADB to increase the technical and business skills of human resources in ICT research institutes responsible for developing local ICT and Internet applications for the poor (ADB 2007b).

Why have SAARC telecom initiatives largely failed?

7.83 SAARC's progress towards economic cooperation has been criticized as being too slow.⁵⁷ The slow pace has most often been attributed to the consequences of political tensions between member states, especially between India and Pakistan over the disputed Kashmir region.⁵⁸ A key prerequisite for regional cooperation in any sector is friendly political relationships and a strong political will to cooperate (Waheeduzzaman 2007). Many believe that the most recent three summits of SAARC, however, were more successful, reflecting an improvement in relations among member states and a strong desire to achieve the goals of the SAARC charter. See Table 7.6 for a summary of these key agreements.

⁵⁷ See Waheeduzzaman (2007) and Hajni (2007) for commentary on and criticism of SAARC's progress towards economic cooperation.

⁵⁸ See ADB (2006) for more background on barriers to economic cooperation in South Asia.

7.84 Another prerequisite for regional cooperation may be economic interdependency (Waheeduzzaman 2007). Intra-regional trade is small in comparison to trade between member countries of other regional trading blocks, representing only about four percent of the region's total trade (De and Bhattacharyay 2007).⁵⁹ Table 7.7, reproduced from De and Bhattacharyay (2007), summarizes the intra-regional trade among Bangladesh, India, the Maldives, Nepal, Pakistan, Sri Lanka, and South Asia in general.⁶⁰ De and Bhattacharyay (2007) report that the South Asia Free Trade Agreement (SAFTA), which will be fully operational by 2016, is expected to increase intra-regional trade from \$6 billion to \$14 billion within two years of its existence.

Table 7.6: Key Agreements from Most Recent SAARC Summits

Summit	Date	Location	Key Agreements
12 th	January 2004	Islamabad, Pakistan	Drafting of the agreement on a South Asian Free Trade Area (SAFTA) with zero customs on nearly all goods by 2016; pledge to eradicate poverty; focus on the prevention and treatment of HIV/AIDS and tuberculosis; condemnation of and pledge to suppress terrorism in South Asia; renewed focus on information and communication technologies; affirmation of improved relations among member states
13 th	November 2005	Dhaka, Bangladesh	Reaffirmation of commitment to make SAARC an effective instrument of cooperation; establishment of the SAARC Poverty Alleviation Fund (SPAF); pledge to further advance economic cooperation via SAFTA, strengthened transportation and communication links, and energy trade; pledge to address South Asia's pressing social and environmental challenges; reaffirmation of pledge to combat terrorism
14 th	April 2007	New Delhi, India	Welcoming of Afghanistan into SAARC; focus on connectivity (physical, economic, and people-to-people); recognition of need to move SAARC from a declaratory to an implementation phase, especially with regards to the operationalization of the SAARC Development Fund (SDF); pledge to collaborate on addressing environmental challenges; establishment of the South Asian University in India; welcoming of China, the European Union, Japan, Iran, South Korea, and the United States as observers

Source: The Islamabad, Dhaka, and New Delhi Declarations of the 12th, 13th, and 14th SAARC Summits, respectively, available on SAARC's website, <http://www.saarc-sec.org/main.php?t=7.1>

7.85 Nonetheless, the Association's summits are drawing the attention of increasing numbers of nations. China, the European Union, Iran, Japan, South Korea and the United States were observers at the Association's 14th summit in April 2007.⁶¹ Mauritius was

⁵⁹ See Hassan (2000) for an economic analysis of SAARC's viability as a cooperative group. See ADB (2006) for more background on barriers to economic cooperation in South Asia and Waheeduzzaman (2007) for commentary on SAARC's progress towards economic cooperation.

⁶⁰ They cite the various issues of the IMF's Trade Statistics Yearbook and UNCTAD's Handbook of Statistics as sources for their table. As a reference, the ECOWAS Handbook of International Trade cites intra-regional trade in 2001 as higher than the SAARC intra-regional trade, with intra-ECOWAS exports making up nine percent of all exports, and intra-ECOWAS imports making up 14 percent of all imports. See <http://www.ecostat.org/en/National-Accounts/EXTERNAL%20TRADE.pdf>.

⁶¹ See *China Daily* (2007) for commentary on China's and other nations' interests in the most recent SAARC summit.

granted observer status for the 15th summit to take place in August 2008 (*The Daily Star* 2007). Australia and Russia have also expressed interest in being granted observer status, while Iran and Myanmar have expressed interest in becoming member nations.⁶² Increased international interest in SAARC's affairs implies that there is a growing perception that SAARC is doing something right, though perhaps not in the telecommunications sector.

Table 7.7: Intra-South Asia Trade

Country	Trade with World			Trade with South Asia			Intra-South Asia Trade		
	\$ Million			\$ Million			%		
	1991	1995	2003	1991	1995	2003	1991	1995	2003
Bangladesh	5100	9600	16000	340	1200	1800	6.6	13	11
India	37000	65000	130000	720	1700	3400	1.9	2.7	2.7
Maldives	220	400	580	33	58	190	15	14	32
Nepal	760	1100	2400	120	160	470	16	15	20
Pakistan	15000	19000	25000	340	420	500	2.3	2.2	2.0
Sri Lanka	5000	8300	12000	370	650	1300	7.3	7.8	11
South Asia (total)	63000	100000	180000	1900	4300	7600	3.0	4.1	4.2

Source: Reproduced from De and Bhattacharyay (2007), rounded to two significant digits.

J. CONCLUSION

7.86 South Asia is made up of largely poor countries with low telecommunications penetration. The few countries with higher than average deployment, namely the Maldives and Sri Lanka, are also the region's wealthier nations. Pakistan, however, has managed a high rate of telecommunications growth despite a low GDP per capita by encouraging foreign investment and introducing regulatory reforms conducive to telecommunications growth. Despite the low overall telecommunications penetration rates in the region, a few countries have experienced high levels of growth in the last few years. Most of the growth is attributable to intra-country regulatory changes and outside investments. Little growth can be directly attributed to regional cooperation.

7.87 Nevertheless, the fundamental network economics inherent to telecommunications mean that tremendous gains are possible if countries can, at a minimum, reduce the costs of interconnecting communications networks across borders. That is, the value of the network to each person connected increases as more people connect. Thus, South Asia could reap real benefits by making it easier not just for people in the region to connect to industrialized countries, but also by making it easier for networks to connect within the region.

⁶² See *The Statesmen* (India) (2007) for commentary on Iran's interests in SAARC; as reported by *The Daily Star* (2007) and Rediff India Abroad (2006).

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8. AIR TRANSPORT LIBERALIZATION IN SOUTH ASIA: IMPACTS ON AIRLINE PERFORMANCE, LOGISTICS PERFORMANCE, INTERNATIONAL TRAFFIC FLOWS AND TOURISM

Yahua Zhang and Christopher Findlay

A. INTRODUCTION

8.1 Surface transportation modes in many developing countries are more important than air transport. The view that relatively expensive air travel belonged only to an elite group was true in South Asia for some time. However, in the last two decades, with the implementation of deregulation and the resultant competition in airline markets, the emergence of low-cost carriers, and rising disposable income, air travel has become more affordable. Air transport has gained increasing importance and now plays a vital role in many South Asian countries. The effects of air transport on tourism and the movement of goods and people are particularly prominent.

8.2 Deregulation in the airline industry initiated by the US, has been followed throughout the world, including the countries in South Asia, to various extents and at different speeds. South Asia is a huge area with a population of over 1.2 billion people. However, the countries within this area differ greatly in population and geographic size. This chapter reviews the development of air transport policy in South Asia in the past two decades, with a concentration on the last 10 years. It appears that all South Asian countries—India, Pakistan, Bangladesh, Sri Lanka, the Maldives and the landlocked Himalaya countries, Nepal and Bhutan—have started to embrace and formulate a liberal air transport policy in which some elements of the open skies concept have been incorporated.

8.3 Air transport is an important facilitator of other trades in goods and services. Modern supply chains are intensive users of air transport. Services sectors, tourism the most obvious example, purchase or have air transport as a complementary input. Other services sectors such as professional services in which the movement of people is important are also significant users of air transport. As we note below, mode 4 transactions are so important in South Asia, Bangladesh for instance, that they are a driver of the growth of air transport systems.

8.4 This chapter explores air transport policy changes and their impacts, summarizing the key features of the policies and using them to construct indicators of the aviation environment. We then examine the performance of the national and private carriers in these countries to establish any link between their performance and national aviation policy. The relationships between the aviation environment index and the logistics performance, international traffic flows and international tourist arrivals are also explored. We begin with a review of air transport activity in South Asia.

B. AIR TRANSPORT ACTIVITY

8.5 The scale of the air transport activity in South Asia is summarized in Table 8.1, which shows the air cargo and passenger movements in India, Pakistan and Sri Lanka in recent years. International cargo movements in India are around 1 million tonnes, about three times the level in Pakistan, whose cargo movements are about twice the volume of that in Sri Lanka. The World Bank (2008) reports an air cargo share in the region of 0.5-1.5% of international tonnage (the world average share is about 1%) and a much higher share of the value of international trade (35-40%). Domestic and international freight across the region grew at over 8% a year from 1998 to 2005 (World Bank (2008) Table 24). India accounts for about 60% of the traffic.

8.6 India's international passenger movements are about 26 million, compared to 14 million in Pakistan and 5 million in Sri Lanka. Domestic passenger movements in India are more than twice those internationally, but domestic air freight is only about half that of the international volume. Domestic traffic in Pakistan is much smaller than its international movements. More detail at the airport level is shown in Annex A.

Table 8.1: Passenger and Cargo Movements for India, Pakistan and Sri Lanka

	Domestic		International	
	Passengers	Cargo (tonnes)	Passengers	Cargo (tonnes)
India				
2005–2006	50,970,000	477,150	22,370,000	920,150
2006–2007	70,620,000	529,640	25,780,000	1,021,260
Pakistan				
2005–2006	7,495,725	115,000	14,615,694	347,674
2006–2007	6,985,869	98,172	14,199,431	312,604
Sri Lanka				
2005	63,954		4,239,161	142,354
2006	29,054		4,585,780	154,132
2007			4,840,998	154,413

Source: Directorate General of Civil Aviation of India; Pakistan Civil Aviation Authority; Civil Aviation Authority of Sri Lanka

8.7 Table 8.2 reports the international tourist arrivals for the six South Asian countries. India experienced the largest growth from 2000 to 2006, followed by Pakistan. Sri Lanka and the Maldives saw moderate growth while Bangladesh and Nepal have been stagnant or have deteriorated in terms of attracting international tourists. We later discuss some of the determinants of the variation in traffic growth.

Table 8.2: International Tourist Arrivals

Year	India	Pakistan	Bangladesh	Sri Lanka	Maldives	Nepal
1998	2,358,629	428,800	171,961	n/a	n/a	n/a
1999	2,481,928	432,200	172,781	n/a	474,473	421,188
2000	2,649,378	556,700	199,211	400,414	465,750	376,503
2001	2,537,282	499,700	207,199	336,794	465,750	298,456
2002	2,384,364	498,100	207,246	393,171	487,189	215,922
2003	2,726,214	500,900	244,509	500,642	567,539	265,600
2004	3,457,477	648,000	271,270	566,202	620,704	288,356
2005	3,918,610	798,300	207,662	549,308	398,146	277,129
2006	4,447,167	898,400	n/a	559,603	604,749	283,516
2007	4,977,193	839,500	n/a	n/a	n/a	n/a
Growth pa 2000–06	9.0%	8.3%	0.8% (to 2005)	5.7%	4.4%	-4.6%

Source: India Ministry of Tourism; Pakistan Ministry of Tourism; Bangladesh National Tourism Organisation; Sri Lanka Tourist Board; the Maldives Ministry of Tourism; Nepal Tourism Board.

8.8 Table 8.3 shows the pattern of flights from airports in South Asia. The main destinations after the region itself are the Middle East, followed by SE Asia and Europe. These patterns are shown to be significant later when we discuss options for new policy strategies.

Table 8.3: Distribution of Non-Stop Flights from Major Airports in South Asia

	Delhi (%)	Mumbai (%)	Dhaka (%)	Chittagong (%)	Colombo (%)	Karachi (%)	Islamabad (%)	Kathmandu (%)	Male (%)
S. Asia	68.8	64.1	41.5	69.0	41.6	57.3	44.5	65.6	67.3
M. East	8.0	14.6	34.9	20.7	31.2	29.6	30.5	17.7	9.1
SE Asia	3.6	5.2	11.9	10.3	16.2	4.2	2.3	7.3	2.7
W. Europe	11.3	6.5	6.7		7.5	3.3	16.4		17.3
NE Asia	4.3	5.0	4.4		3.5	2.8	4.7	8.3	1.8
N. America	2.2	2.0				2.4	1.6		
E/C Europe	1.0	0.3				0.5			0.9
Africa	0.3	1.7							0.9
C. Asia	1.0		0.7					1.0	

Source: Air Transport Intelligence (based on 14–20 April 2008).

8.9 Airline performance also varies considerably across the region. Annex B contains summary statistics that show that most national airlines experienced losses in recent years. As will be reviewed later, these national carriers have served social goals in addition to commercial performance. Martin and Parker (1997) contend that when state-owned firms pursue other objectives, the ability to achieve efficiencies is weakened. Backx et al. (2002) have examined the influence of an airline's ownership structure on aspects of its performance and find that pure private airlines outperform pure public

airlines, with airlines with mixed ownership lying in between. Some of the propositions that they have confirmed also receive support from our data in Annex B. Specifically, these are:

Privately owned airlines exhibit higher profit margins than state-owned airlines.

8.10 Privately owned Jet Airways' reported net profit margin, for example, is much higher than that of Air India and Indian Airlines. Sri Lankan, a national carrier with hybrid ownership, reported a positive net profit margin consistently from 2002 to 2006. This result is better than the government-owned Biman and the two Indian national carriers.

Privately owned airlines exhibit higher employee productivity levels than state-owned airlines.

8.11 Employee productivity, defined as the ratio of total revenue to the number of employees, shows that privately owned airlines Jet Airways and Deccan have the highest employee productivity, followed by Air India and Sri Lankan. Indian Airlines, Biman and PIA are at the bottom of the ranking. Employees per aircraft provide another measure of a carrier's efficiency: a smaller ratio of the number of employees over the number of aircraft indicates greater efficiency. All the private carriers—Airblue, Jet Airways and Deccan—report an employee-to-aircraft ratio of less than half that of the national carriers, indicating higher productive efficiency of the privately owned carriers.

8.12 Backx et al. (2002) find no strong evidence supporting the hypothesis that privately owned airlines exhibit higher passenger load factors than state-owned airlines. However, there is some evidence to that effect in South Asia and the data in Annex B indicate that the private carriers had higher load factors than most of the national carriers.

8.13 Increments to capacity by some carriers in South Asia have lagged behind the growth of air travel demand. We hypothesise that national airlines do not have a strong incentive to expand compared to their private counterparts. We are unable to test this hypothesis using statistical methods, but the relatively small fleet sizes of the nationally owned South Asian carriers are relevant. These carriers also show slow passenger growth (compare Indian and Air India with Deccan and Jet, for example). The scale of the national airlines could be larger, we expect, given the huge populations of Indian, Pakistan and Bangladesh and the booming economic activity over the past few years. In comparison, it is interesting to note that after the airline consolidations in China in 2002, the China Southern group alone had a fleet of 186 aircraft even without considering other Chinese national carriers. Indian and Air India between them have a fleet of 93 aircraft. Another obvious reason for the stagnancy of the aviation sector is that most governments in South Asia are unable to finance the investment required. These observations lead to a focus on the reform of ownership arrangements in this industry, to which we return below.

8.14 Online airfares (lowest economy class) of the routes from several South Asian capital cities to London, Singapore, Bahrain, New York and Shanghai can be found in Annex C. For many destinations, routes departing from Delhi exhibit lower fares than from most of other cities. Does India have a relatively liberal aviation environment and

does this contribute to the result of relatively low fares? We examine the question of Indian policy compared to that of other South Asian economies in the next section and in the section following discuss the impact of policy on the performance of markets for air transport.

C. CIVIL AVIATION POLICY REVIEW

8.15 Variation in ownership structures exist across the region. Table 8.4 provides a summary of those structures in the context of other recent developments.

8.16 Overall, there has been a trend towards further liberalization in civil aviation in all the countries since 2000. However, the actual achievement of liberalization varies from country to country. For example, although many countries have realized the value of loosening ownership control over the national carriers few have achieved, largely because of political responses by local communities and union objections. Some national carriers have failed to provide sufficient capacity to meet the increasing air travel demand, which is a significant impediment to the growth of the tourism industry and the overall economy. Limits on private airlines (for example, the restrictions on flying international routes) may have stunted their growth, which might otherwise have been possible through international operations.

8.17 We now compare more carefully the evolution of policy across countries and over time. The methodology is based on the application of a frequency measure that Hoekman (1995) developed to use as an index to quantify barriers to trade in service. This approach has been applied in telecommunications (Warren 2001), banking (McGuire and Schuele 2001), maritime transport (McGuire et al. 2001) and professional services (Nguyen-Hong 2000). To analyze the relationship between air transport liberalization, private ownership and competition, and airfares at national and route levels, Gonenc and Nicoletti (2000) constructed summary indices measuring country-level and route-level regulation, market structure and infrastructure access. Following this approach, Doove et al. (2001) first constructed a bilateral index to quantify restrictions across various bilateral agreements and then examined the impact of such a policy index on airfares. They found significant fare reductions were associated with more liberal arrangements.

8.18 We use a similar approach to the regulatory and market environment in the aviation sector in the seven South Asian countries. Two sets of indices are constructed representing restrictiveness of the domestic market and the international market for periods around 1999 to 2001 and 2005 to 2007, respectively. We consider the policy for a period of three years instead of one particular year, mainly because we consider a series of policies that normally cannot be formulated and implemented in one year. In the construction of this index, a country with a higher score is more restrictive in aviation policy while a country with a lower score tends to have a more liberal aviation environment. However, as with other similar studies, the problem of selection bias and arbitrariness in the indicators chosen to assess the aviation environment is unavoidable. There might be some other relevant indicators that could be used to construct the indices that are not included in this study because the data are not available. Unless specified, most data used here are from the civil aviation authorities' websites of each country and the relevant airlines' websites.

Table 8.4: Country Aviation Policy Summaries

India	India is one of the leaders in South Asia that initiated deregulation as early as the 1980s, partly driven by the growing demand from the tourism industry. The two state-owned airlines were corporatized and the private airlines were allowed to provide scheduled services in 1994. Since then, the private airlines have expanded at a very fast pace. Jet Airways became the largest domestic airline in August 2001. More private airlines, including low-cost airlines, mushroomed in the new century, but they are only permitted to fly international routes after five years of domestic operation, which has been a constraint for them to grow through international competition. Even though the eligible private airlines can service the international markets, the allocation of routes is made by the government. The two inefficient state-owned airlines merged in 2007, leading to a wave of consolidations between private carriers. The government has decided to privatize the national airline with a limit of 49% for foreign equity, but this goal has not been achieved mainly because of political reasons and opposition from trade unions. Foreign investment into domestic air transport services is not allowed. An open skies agreement has been signed with the US.
Bangladesh	Private airlines emerged in 1996 in Bangladesh with the institution of a program of deregulation. However, because of the low disposable income, the domestic market alone cannot generate enough revenue to enable Bangladeshi carriers to grow. The large movements of migrant workers between Bangladesh and the Middle East as well as South Asia in recent years have pushed up demand for air travel. Unfortunately, the national carrier Biman did not seize this opportunity for growth and instead has cut back on destinations in the last few years. The airline was restructured in 2007 and became a limited company, but failed to find a strategic partner. In contrast, the private carrier GMG has been relatively successful and could win more private investment. But its growth is still constrained by limited access to international markets. More liberal bilateral arrangements are being sought by the government, but an open skies negotiation does not seem to have been a priority.
Pakistan	Pakistan's deregulation in the aviation sector began in the early 1990s, but the government-owned national carrier, PIA, still dominates both the domestic market. The private airline Air Blue has gained popularity in recent years, but it is rather small in scale. Lacking funds to update its aircraft fleet, in 2007 PIA flights were banned from flying to Europe because of safety concerns. Although this ban has been lifted, PIA's reputation has been seriously damaged and its network has shrunk. The government's plan to privatize PIA to raise funds, has been resisted by the trade unions. Pakistan intends to become a transportation hub linking East and West. To achieve this, it adopted a relatively liberal aviation policy in the 1990s and has signed several open skies agreements with a number of countries. The National Aviation Policy of 2007 committed Pakistan to seeking open skies arrangement in the freight sector and more liberal arrangement in passenger transportation. The government also committed to granting more rights to the private airlines to enter international markets.
Sri Lanka	Sri Lanka was the first South Asian country to privatize its national carrier when it handed the management right to a foreign company—Emirates. Ten years after the privatization, the national carrier, SriLankan, has become more competitive and has an improved financial status. However, because of the threat of terrorism, Sri Lanka's domestic air services have stagnated since the mid-1990s. Therefore, there is little opportunity for private airlines in the domestic market. Meanwhile, most of the international traffic rights have been retained for SriLankan. As a result, there is no competent private airline in this country. Sri Lanka has now concluded open skies agreements with the US, Thailand, Singapore, Malaysia and Switzerland.
Nepal	Triggered by the high demand from the tourism industry and India's deregulation experience, Nepal started its liberalization in the aviation sector in 1992, hoping to bring in private investment. Private airlines were soon established but most have not survived for long, mainly because of fatal air disasters. Therefore, Nepal introduced a more liberal aviation policy in 2006 to replace that of 1993. The new policy clearly states the need to upgrade and expand domestic airports and to privatize the national carrier, Nepal Airlines. Private airlines can operate international flights after five years of domestic experience. Foreigners are allowed to have an 80% stake of the Nepali airlines operating international services and a 49% stake of those engaging in domestic services only.
Bhutan	Bhutan has only one airline and one airport, with no domestic services. Fifth freedom rights have been granted to its national airline, Druk Air, for picking up traffic from a number of Indian cities to Singapore and Dhaka. Alternative airport construction is being considered. Communication and navigation facilities as well as staff training are main issues that need to be addressed in expanding this country's aviation sector.
Maldives	The Maldives has adopted a liberal aviation policy on international routes and has signed a full open skies agreement with the US. However, the domestic market is not open to foreign carriers and it is mainly serviced by the national airline and a number of private airlines. The national airline is now acquiring capital aiming to service the international market. Private investment has been invited to participate in the construction and development of the Maldives' airports.

Domestic Market Index

8.19 We consider the following eight issues, which are elements of the domestic index and that influence airline competition on domestic routes.

Existence of a comprehensive air liberalization program (e.g., well-formulated policy/master plan/road map)

8.20 The enactment of the 1978 Deregulation Act in the US codified the developments in the policies of fare flexibility and more liberal entry and exit that had developed over the previous year, and allowed deregulation measures to be phased in. As a result, airlines had full freedom to enter any market in 1981, and the full freedom to set fares in 1982 (Pickrell 1991). The Act played an important role in guiding the development of the US civil aviation industry, leading to a climate change in this sector in the following three decades. The existence of this comprehensive air liberalization program shows the resolution of the US government in pursuing openness and represents consensus among different interest groups towards this direction.

8.21 The 2003 Naresh Chandra Committee's report in India has been served as a road map for the continuing reforms in the civil aviation sector, as has Pakistan's 2007 NAP (draft). Nepal and Bhutan have also formulated a clear policy in the civil aviation sector. Therefore, these countries are assigned a value of 0 when we consider the aviation policy in the period from 2005 to 2008. In contrast, Bangladesh has not promulgated a comprehensive policy to reform its airline industry although there are signs that it is seeking a liberal policy. Therefore, we give a value of 1 to this country. Sri Lanka receives a value of 0.5 because, even though it was the first to privatize a national carrier, as early as 1998, the clarity of its aviation policy in 2007 and 2008 has lessened with the termination of the contract with Emirates. The Maldives lacks a comprehensive policy over its domestic market but, given that it opened its domestic market to private carriers in the 1990s, we assign it a value of 0.5.

8.22 In the period around 1999 to 2001, Sri Lanka receives a value of 0 because of its series of reforms in the aviation sector, including the privatization of the national airline and preparations for the establishment of the Civil Aviation Authority of Sri Lanka as a Public Enterprise (established in 2002). No other country in this period was prepared to adopt more liberal reforms. The Maldives, however, is given a value of 0.5 for the same reason it was given that score in the later period.

Whether or not the national airline has been privatized

8.23 Kemal (2000, p. 145) identified the major objectives of privatization in Pakistan as:

- Improving the level of efficiency in the production processes;
- Reducing the government's debt burden and fiscal deficit;
- Broad-basing of equity capital; and
- Releasing resources for physical and social infrastructures.

8.24 Although there have been calls in almost all the South Asian countries for privatizing the national carrier, only Sri Lanka has achieved this goal. Too many government interventions and strong union opposition in countries such as India and Pakistan may have scared off the potential buyers.

8.25 Sri Lanka was one of the countries that adopted privatization as state policy in the 1980s. According to Kelegama (1995), the employees were appeased by being offered shares in the privatized entity and a voice in decision making. When Air Lanka was privatized in 1998, the privatization policy had been in place for more than 10 years and the government had gained experience in dealing with the issues accompanying privatization. Knight-John and Athukorala (2005) note that the ownership change in the late 1990s in Sri Lanka largely retained the existing employees, most of whom benefited from the privatized entities through improved pay and better working conditions.

Reported public service obligations of national airline/reported objections/strikes from politicians/trade unions in pursuing privatization of the national airline

8.26 National carriers are often burdened with obligations in the name of national or public interests, including promotion of employment. Here, we only record a value of 1 for the country in which the obligations have been a heavy burden to the carrier and this has been widely reported. These obligations may take several forms. In India, the route dispersal guidelines have been imposed on all carriers, especially on the national carrier (Jain 2006). In Bangladesh, Biman was required to serve domestic routes using wide-bodied aircraft (Hossain et al. 2007). In Pakistan, the *Business Recorder* (2008) urged the Pakistani government to grant full powers to the PIA management team so that they could take personnel and commercial decisions without government interference. Even though Sri Lanka has been partly privatized, interference from the government is reported occasionally. The failure to respond to a request from senior officials to clear 35 seats for a government team on an over-booked flight from London to Colombo in December 2007 might have triggered the government re-taking the management rights of the national carrier (Ionides 2008). We have not found any substantial intervention in other countries.

Foreign equity participation of the domestic airline

8.27 The ownership restrictions for airlines that have been a norm in almost all the countries in the past few decades underpin the system for designation and authorisation of airlines in bilateral agreements (Doove et al. 2001). While this norm has been challenged in the last 20 years, it has not been uprooted. For example, in some countries, such as Australia, the domestic market is open to a foreign-owned carrier, but the international route operating rights are still designated to the carriers that are “substantially owned and effectively controlled” by the country or nationals of that country.

8.28 Countries in South Asia that have a 49 percent cap on foreign ownership include India, Sri Lanka and Nepal. Bangladesh, Pakistan and the Maldives have had private carriers wholly owned by foreign companies, so we assume there is no upper limit for

ownership. Bhutan is a special case as it has only one carrier and we have no information about the maximum percentage that a foreigner can own. We thus assign it a value of 0.5.

Investment in domestic air transport services by foreign airlines

8.29 Except India, which has clearly stated that foreign airlines are not allowed to invest in domestic air transport services, we have not found similar regulations in any South Asian country.

Existence of private airlines/low-cost carriers

8.30 Private airlines need not necessarily be low-cost airlines. However, many new private entrants take a low pricing strategy to increase their market share. Many private airlines were created simply because they see the prosperity of the operation of low-cost carriers. Except for Bhutan, all other countries under study have had private or low-cost carriers, or both. This has contributed to the higher levels of competition now present in these markets compared to 10 years ago.

Number of existing carriers

8.31 This indicator considers only airlines that are already in operation and only scheduled passenger carriers. In general, a large number of competitors in a market indicate a low legal entry barrier and a liberal aviation environment.

Airport privatization or handover management right to foreigners

8.32 Hooper (2002) summarized some of the motives towards privatization of airports. These include: pursuing efficiency by exposing airports to competition; introducing private sector incentives and forms of organization; easing governments' financial commitments; and decentralizing decision making for airports. Many major airports in South Asia have suffered congestion and shortages of funds to upgrade existing airport facilities. In some countries, such as the Maldives, tourism is poised to expand, but the inadequate infrastructure has become a bottleneck for its growth. However, although many countries have the intention to invite private investment or private management, only India has put this intention into action. The extent of airport privatization is another element of the index.

International Market Index

8.33 Bilateral air services agreements continue to be the prevailing approach to expanding international air transport services. According to the ICAO (2006) Information Paper, during the period from 1995 to 2005, about 900 bilateral air services agreements (including amendments or memoranda of understanding) were negotiated, over 70 percent of which contained some form of open skies arrangements, including unrestricted traffic rights such as third, fourth and in some cases fifth freedom traffic rights, multiple designation with or without route limitations, free determination of capacity, a double disapproval or country of origin tariff regime, and broadened criteria

of air carrier ownership and control. In recent years, provisions dealing with new types of commercial activities, such as computer reservation systems (CRSs), airline code-sharing, leasing of aircraft and intermodal transport have been included in bilateral agreements.

8.34 Led by the US, the concept of “open skies” was first incorporated in the agreement between the Netherlands and the US. The US has actively sought to establish open skies agreements with other countries. The fact sheet provided by the Under Secretary for Economic, Energy and Agricultural Affairs of the US Department of State (2006),¹ details the following key provisions of open skies:

- **Free Market Competition**
No restrictions on international route rights; number of designated airlines; capacity; frequencies; or types of aircraft.
- **Pricing Determined by Market Forces**
A fare can be disallowed only if both governments concur—“double-disapproval pricing”—and only for certain, specified reasons intended to ensure competition.
- **Fair and Equal Opportunity to Compete**
For example:
 - All carriers—designated and non-designated—of both countries may establish sales offices in the other country, and convert earnings and remit them in hard currency promptly and without restrictions. Designated carriers are free to provide their own ground-handling services—“self handling”—or choose among competing providers. Airlines and cargo consolidators may arrange ground transport of air cargo and are guaranteed access to customs services.
 - User charges are non-discriminatory and based on costs.
- **Cooperative Marketing Arrangements**
Designated airlines may enter into code-sharing or leasing arrangements with airlines of either country, or with those of third countries, subject to usual regulations. An optional provision authorizes code-sharing between airlines and surface transportation companies.
- **Provisions for Dispute Settlement and Consultation**
Model text includes procedures for resolving differences that arise under the agreement.
- **Liberal Charter Arrangements**
Carriers may choose to operate under the charter regulations of either country.

¹ Available at: <http://www.state.gov/e/eeb/rls/fs/2006/208.htm>.

- **Safety and Security**
Each government agrees to observe high standards of aviation safety and security, and to render assistance to the other in certain circumstances.
- **Optional 7th Freedom All-Cargo Rights**
Provides authority for an airline of one country to operate all-cargo services between the other country and a third country, via flights that are not linked to its homeland.

8.35 By 30 May 2008 the US had concluded open skies agreements with 92 countries and territories and by February 2008, worldwide, 142 bilateral “open skies” agreements had been signed, involving 91 countries and territories (ICAO 2008). Over 60 percent of the agreements grant seventh freedom traffic rights for all-cargo services, 11 agreements grant seventh freedom traffic rights for passenger services and 10 agreements grant eighth freedom traffic rights or consecutive cabotage rights for all services (ICAO 2008). Understanding that some countries have difficulty in implementing the liberal agreement immediately, some transitional arrangements were made, allowing for the phasing-in of higher frequencies, fifth freedom traffic rights, seventh freedom traffic rights for all-cargo, third country code-sharing, charter services and ground handling.

8.36 The open skies agreements have been assessed to make a significant difference to transport costs. In a study of freight routes from the United States, Micco and Serebrisky (2006) found that signing an open skies agreement reduced rates by 9 percent and increased by 7 points the share of imports arriving by air (they did not however test the effect of entry by third country carriers onto routes covered by the agreements).

8.37 As well as bilateral agreements for air transport service liberalization, ICAO (2008) reports examples of attempts at regional and plurilateral liberalization. The World Trade Organization (WTO), the intergovernmental organization known as the General Agreement on Tariffs and Trade (GATT) before 1995, is responsible for the rules governing trade in goods and services and trade-related aspects of intellectual property. The Annex on Air Transport Service to the General Agreement on Trade in Services (GATS) under the WTO has applied trade rules and principles such as most-favored-nation (MFN) treatment, national treatment and transparency to three specific so-called “soft” rights: aircraft repair and maintenance, selling and marketing of air transport, and Computer Reservation System (CRS) services. However, the traffic rights (or hard rights) are excluded from the WTO framework. In 2000 the WTO initiated a review of the annex with the possibility of expanding its coverage, but received no global consensus. The second-round review of the annex on Air Transport Service starting from 2005 has yet to reach any conclusion. A multi-agreement under the WTO framework to liberalize air transport services is not likely in the short term, and certainly not within the current round of negotiations. It may be easier for a small group of countries to achieve this on a regional/plurilateral basis. ASEAN is on the way towards this goal.

8.38 According to the ICAO (2006) some countries have sought to liberalize air transport services, in whole or in part, on a unilateral basis at selected airports and/or for limited periods. Such “open skies” policies for foreign airlines’ international air services

have been temporarily or permanently adopted in Bahrain, Cambodia, Chile, China, Ecuador, Guatemala, Honduras, India, Lebanon, Pakistan, the Philippines, Sri Lanka, Tunisia and the United Arab Emirates, among others.

8.39 We now consider the following indicators in constructing an index for international market regulation and liberalization constraints. Some indicators used for domestic market index construction also have implications for international air service liberalization and are therefore also included (the existence of a comprehensive air liberalization program and airport privatization/leasing management right to foreigners). The additional indicators are:

Adopted unilateral short-period open skies policy in the past

8.40 We mentioned above that for one reason or another many countries have adopted the unilateral open skies policy for a short period, primarily when the national carrier has failed to provide sufficient capacity in the high air travel demand period. A country with such experience usually has a better understanding of the benefit and cost of the open skies policy and is more likely to embrace such a policy in the future.

Signed an open skies agreement with at least one country

8.41 As countries have realized that its implementation will boost tourism and the movements of goods and people they have gradually embraced the US-led open skies policy. India, Pakistan, Sri Lanka and the Maldives have signed bilateral open skies policies with a number of countries (Table 8.5). A value of 0 is given to countries that have open skies agreements with their significant trade partners. For example, Sri Lanka has concluded open skies agreements not only with the US but also with some Southeast Asian countries such as Singapore and Malaysia, which have close economic links with Sri Lanka. India, Pakistan and the Maldives receive a value of 0.5 as they have only signed an open skies agreement with the US (Pakistan also has an open skies arrangement with Switzerland, but their economic tie is not strong). Other countries take on a value of 0 for not entering into any open skies agreements.

Table 8.5: Open Skies Agreements Concluded by South Asian Countries

Country	Countries with which open skies agreement signed
India	United States (2005)
Pakistan	United States (1999) Switzerland (1998)
Bangladesh	None
Sri Lanka	United States (2001), Thailand (2004), Singapore (2005), Malaysia (2005), Switzerland (2005)
Maldives	United States (2005)
Nepal	None
Bhutan	None

The open skies agreement(s) signed include(s) seventh freedom all-cargo rights

8.42 In the open skies agreements signed between the US and India and the Maldives, all-cargo seventh freedom rights are permitted, i.e., airlines of these countries can

perform international cargo operations without a connection to their homeland. The open skies agreement between Sri Lanka and Singapore concluded in 2005 also contains the seventh freedom right.

Eighth and ninth freedom rights (consecutive cabotages) granted for foreign airlines

8.43 Findlay (2003) argues that bilateral open skies arrangements do not achieve a full standard openness of markets on the grounds that coverage has not been extended to domestic routes. So far none of the South Asian countries under study have opened up their domestic markets to foreign airlines.

Pursuing more liberal bilateral agreements including relaxing the restrictions on capacity, increasing the number of designated airlines and opening more domestic airports to foreign carriers

8.44 While it appears to be difficult for some countries to conclude bilateral open skies agreements at this stage, almost all the countries under study are pursuing more liberal bilateral arrangements with other countries on a reciprocal basis, such as increasing the number of designated airlines, capacity, frequencies, etc (MoIC 2007; *Financial Express* 2008).

Private airlines are allowed to fly international routes

8.45 In recent years private carriers have become the designated carriers flying international routes in many countries but they still face some restrictions. This policy has implications for market structure and airline competition. We include an indicator to show how private carriers are treated in the international markets. As Bhutan has no private carrier and even the Maldives' national carrier only launched its international arm recently, we assign each a value of 0.5.

D. Results

8.46 The score for each specific policy indicator can be found in Tables 8.6 and 8.7. Figures 8.1 and 8.2 present the total scores, ranging from 0 to 8, for the domestic market and international market, respectively. The higher the score, the higher is the level of restrictiveness. There appears a converging trend in the policies in domestic markets from 2000 to 2006 while policy in international markets shows more variation. In particular, India, followed by Pakistan, show relatively open policies on international routes. India has taken the lead in policy change.

8.47 It is worth noting that for the domestic index, indicators 4 and 5, namely, foreign equity participation in domestic airlines and foreign airline investment in domestic airlines, are the sources of discrimination on foreign firms in the domestic market before a country opens up the eighth and ninth freedoms. These two indicators distinguish a foreign firm from a domestic firm. However, if foreign investment is permitted without such restrictions, then foreign-owned firms are treated largely the same as domestic firms. In fact, many of the private airlines in South Asia are partly or wholly owned by foreigners but they are treated the same as the local businesses. Figure 8.3 presents the

difference in index score faced by foreign firms and domestic firms around 2006. The difference in values comes from the restrictions in indicators 4 and 5. The highest score that a domestic firm could gain is therefore 6, not 8. The figure shows a relatively high degree of discrimination in the application of policy in the case of India but less so in other countries.

8.48 Of all the indicators discussed above, ownership is central. Once the ownership control has been loosened, it is likely that government interference will be reduced and further liberalization measures would be expected to follow. Otherwise, it is difficult for private carriers to compete, since any further move towards liberalization would take the national carriers' interests into consideration. For example, national carriers will strongly influence the open skies negotiation process. Also, direct or indirect financial assistance may be inevitable if a firm is substantially controlled by the government. These all imply that if the substantial control over the national carrier is not removed, the effect of any future liberalization will be limited.

Table 8.6: Restrictiveness indices for domestic and international markets (around 1999 to 2001)

		Score	India	Pakistan	Bangladesh	Sri Lanka	Nepal	Bhutan	Maldives
Domestic market regulation and liberalization constraints			6.08	4.33	4.66	3.16	3.83	5.50	2.16
Existence of a comprehensive air liberalization program (well-formulated policy/master plan/road map)	Yes	0.00				0.00			
	No	1.00	1.00	1.00	1.00		1.00	1.00	
	Other								0.50
Has the national airline been privatized	Yes	0.00				0.00			0.00
	No	1.00	1.00	1.00	1.00		1.00	1.00	
Reported public service obligations of national airline/reported objection/strike from politicians/ trade unions in pursuing privatization of the national airline	Yes	1.00	1.00	1.00	1.00	1.00			
	No	0.00					0.00	0.00	0.00
Foreign equity participation of the domestic airline	There is no cap	0.00		0.00	0.00			0.00	0.00
	There is a cap higher than 49%	0.25							
	There is a cap of 49%	0.50				0.50	0.50		
	There is a cap less than 49%	0.75	0.75						
	Foreign investment in airlines is not allowed	1.00							
	No information/not relevant	0.50						0.50	
Investment in domestic airlines by foreign airlines	Yes	0.00		0.00	0.00	0.00	0.00	0.00	0.00
	No	1.00	1.00						
Existence of private airlines/low-cost carriers	Yes	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	No	1.00						1.00	
Number of existing	2 or fewer	1.00						1.00	

passenger airlines	3 to 5 (included)	0.66			0.66	0.66			0.66
	5 to 10 (included)	0.33	0.33	0.33			0.33		
	more than 10	0.00							
Existence of private/privatized international airports/lease management right to foreigners	Yes	0.00							
	No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
International market regulation and liberalization constraints			6.00	5.50	6.00	6.00	7.00	6.50	6.00
Existence of a comprehensive air liberalization program (well-formulated policy/master plan/roadmap)	Yes	0.00				0.00			
	No	1.00	1.00	1.00	1.00		1.00	1.00	
	Other								0.50
Adopted unilateral short-period open skies policy in the past	yes	0.00	0.00	0.00					
	No	1.00			1.00	1.00	1.00	1.00	1.00
Signed open skies agreement with other countries	Yes, with more than one country	0							
	Yes, with only one country	0.5		0.5					
	No	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Open skies agreement includes seventh freedom rights	Yes	0.00							
	No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Eighth and ninth freedom rights granted for foreign carriers	Yes	0.00							
	No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Pursuing more liberal bilateral agreements including relaxing the restriction on capacity, increasing the number of designated airlines and opening more domestic destinations to foreign carriers	Yes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	No	1.00							
Private airlines allowed to fly international routes	Yes	0.00			0.00				
	Yes, but after servicing domestic markets for one year	0.20							
	Yes, but after servicing domestic markets for five years	0.50							
	No	1.00	1.00	1.00		1.00	1.00		
	Not available	0.50						0.50	0.50
Existence of private/privatized international airports/lease management right to foreigners	Yes	0.00							
	No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 8.7: Restrictiveness indices for domestic and international markets (around 2005 to 2007)

		Score	India	Pakistan	Bangladesh	Sri Lanka	Nepal	Bhutan	Maldives
Domestic market regulation and liberalization constraints			3.50	2.66	4.33	3.66	2.83	4.50	2.83
Existence of a comprehensive air liberalization program (well-formulated policy/master plan/road map)	Yes	0.00	0.00	0.00			0.00	0.00	
	No	1.00			1.00				
	Other					0.50			0.50
Has the national airline been privatized	Yes	0.00				0.00			
	No	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Reported public service obligations of national airline/reported objection/strike from politicians/trade unions in pursuing privatization of the national airline	Yes	1.00	1.00	1.00	1.00	1.00			
	No	0.00					0.00	0.00	0.00
Foreign equity participation of the domestic airline	There is no cap	0.00		0.00	0.00			0.00	0.00
	There is a cap higher than 49%	0.25							
	There is a cap of 49%	0.50	0.50			0.50	0.50		
	There is a cap less than 49%	0.75							
	Foreign investment in airlines is not allowed	1.00							
	No information	1.00						0.50	
Investment in domestic airlines by foreign airlines	Yes	0.00		0.00	0.00	0.00	0.00	0.00	0.00
	No	1.00	1.00						
Existence of private airlines/low-cost carriers	Yes	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	No	1.00						1.00	
Number of existing passenger airlines	2 or fewer	1.00						1.00	
	3 to 5 (included)	0.66		0.66		0.66			
	5 to 10 (included)	0.33			0.33		0.33		0.33
	more than 10	0.00	0.00						
Existence of private/privatized international airports/lease management right to foreigners	Yes	0.00	0.00	0.00					
	No	1.00			1.00	1.00	1.00	1.00	1.00
International market regulation and liberalization constraints			1.50	2.70	5.00	3.50	4.50	5.50	4.50
Existence of a comprehensive air liberalization program (well-formulated policy/master plan/road map)	Yes	0.00	0.00	0.00			0.00	0.00	
	No	1.00			1.00				
	Other					0.50			0.50

Adopted unilateral short-period open skies policy in the past	yes	0.00	0.00	0.00	0.00		0.00		
	No	1.00				1.00		1.00	1.00
Signed open skies agreement with other countries	Yes, with more than one country	0.00	0.00			0.00			
	Yes, with only one country	0.50		0.5					0.5
	No	1.00			1.00		1.00	1.00	
Open skies agreement includes seventh freedom rights	Yes	0.00	0.00			0.00			0.00
	No	1.00		1.00	1.00		1.00	1.00	
Eighth and ninth freedom rights granted for foreign carriers	Yes	0.00							
	No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Pursuing more liberal bilateral agreements including relaxing the restriction on capacity, increasing the number of designated airlines and opening more domestic destinations to foreign carriers	Yes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	No	1.00							
Private airlines allowed to fly international routes	Yes	0.00			0.00	0.00			
	Yes, but after servicing domestic markets for one years	0.20		0.20					
	Yes, but after servicing domestic markets for five years	0.50	0.50				0.50		
	No	1.00							
	Not available	0.50						0.50	0.50
Existence of private/privatized international airports/lease management right to foreigners	Yes	0.00	0.00	0.00					
	No	1.00			1.00	1.00	1.00	1.00	1.00

Figure 8.3: Restrictiveness indices for the domestic market in periods around 2000 and 2006

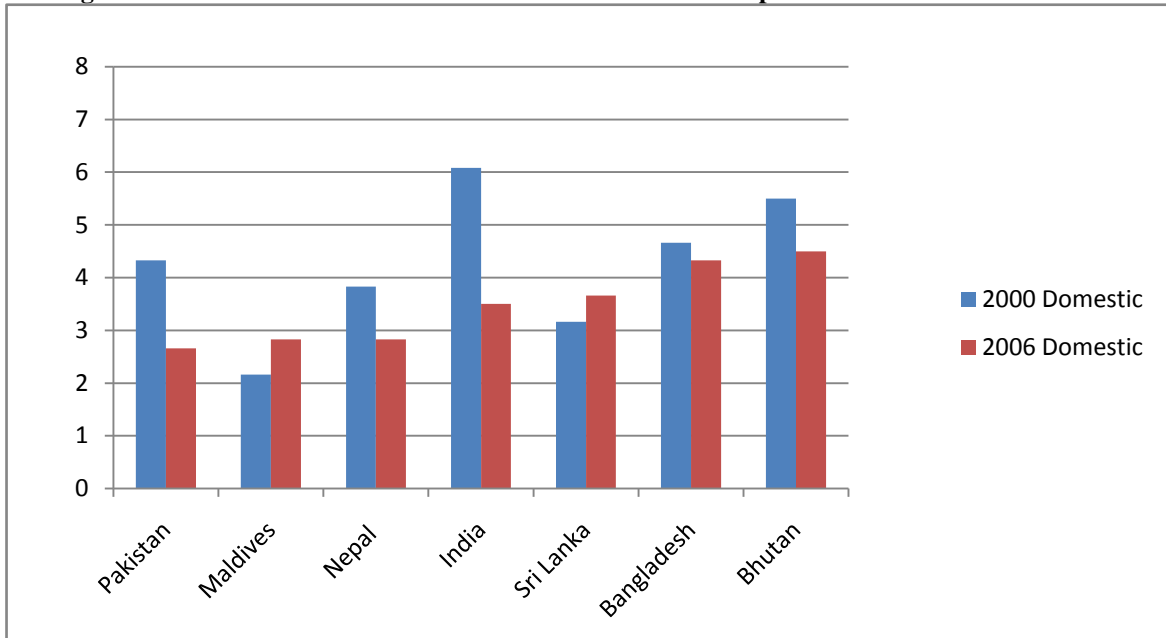


Figure 8.4: Restrictiveness indices for the international market in periods around 2000 and 2006

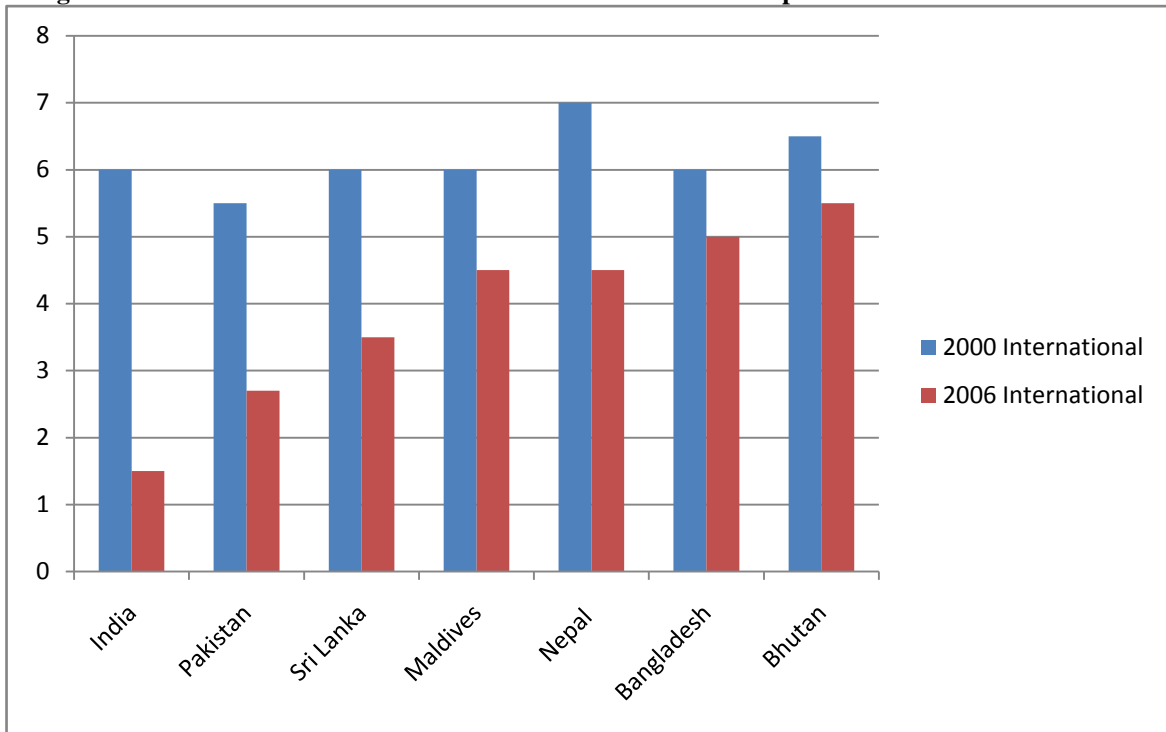
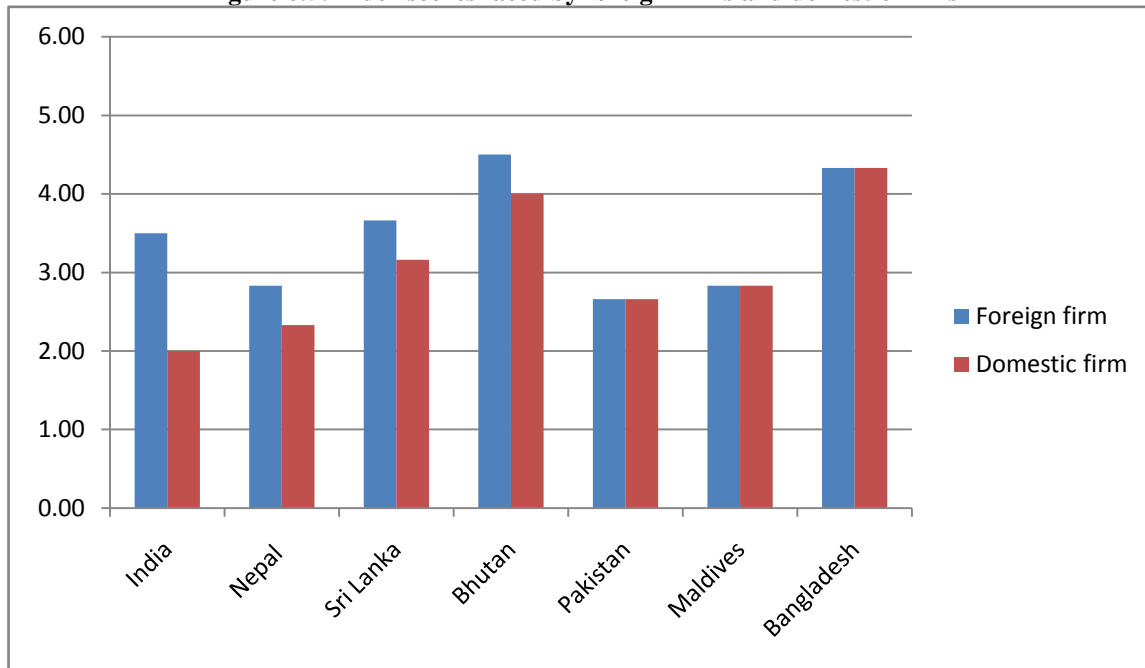


Figure 8.5: Index scores faced by foreign firms and domestic firms



D. IMPACT OF THE POLICY

8.49 In this section we return to the question of the impact of policy measures on the performance of the air transport system. In this section, we refer to the experience of

- Airline performance
- Logistics performance
- Traffic growth

8.50 As noted, we are limited by the availability of data and the small sample size, so we cannot employ an econometric model to establish a statistical relationship between the aviation regulatory environment and the performance of the carriers. However, the commonly used indicators of airline performance and efficiency and their correlation with the conditions of their operating environment are of interest.

8.51 Dee (2003) explained that the welfare effects of services policy reform depend on whether the policy measures are cost or profit increasing. The former might include restrictions on the operating environment (community service obligations, for example) and the latter might include barriers to entry. Some measures have both sorts of effects, but removing cost-increasing measures will have more significant welfare effects. The earlier discussion suggests that what matters in regard to the allocation of the effect of policy measures between cost and profit is the condition of ownership of the carriers: a change of ownership structure would add to national welfare even without a change in other aspects of policy through its contribution to lower costs.

8.52 Leinbach and Bowen (2004) examine the determinants of the choice of air freight in the electronics supply chains in Southeast Asia. They identify a number of factors which explain the likelihood of using what they call air cargo services (that is the bundle

of air freight and the set of complementary services). They stress factors beyond the value of the cargo relative to its weight, which is a standard explanatory variable. They highlight the rapidity of the product cycles, and also the risk of damage and the cost of that damage in sea freight, as well as the nature of inventory control systems. They stress how conventional airport to airport services have been embedded into logistics services and how the provision of this bundle of services has facilitated the participation of particular regions in global production networks.

8.53 We can explore the relationship with logistics services using the World Bank’s Logistics Performance Index (LPI) for 150 countries (Arvis et al. 2007). The LPI is based on a survey of multinational freight forwarders and express carriers. The index was constructed from the views of these professionals and reflects the logistics “friendliness” of the countries where they are based and those with which they trade. The LPI values range from 1 (worst) to 5 (best), aggregated from the indicators covering customs procedures, logistic costs, infrastructure quality, the ability to track and trace shipments, the time taken to reach a destination, and the competence of the domestic logistics industry.

8.54 Figures 8.4 and 8.5 show the relationship between LPI and the air transport restrictiveness indices. There is no apparent relationship to domestic policy but we find an inverse relationship between LPI and the aviation environment index for the international market. A less restrictive environment is associated with better LPI scores. When a country such as India or Pakistan has a more liberal operating environment the views of the freight forwarders are relatively positive while countries where the aviation policies are relatively less open fail to achieve a higher performance score.

Figure 8.6: LPI and Air Transport Restrictiveness Index Values in Domestic Markets

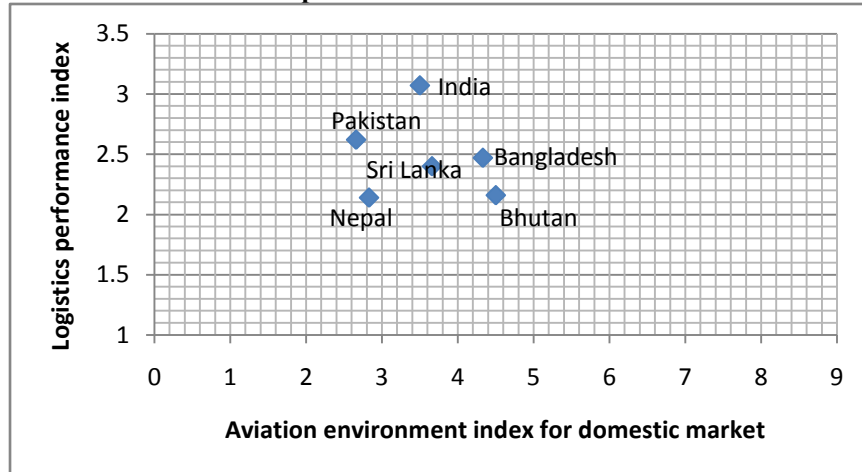
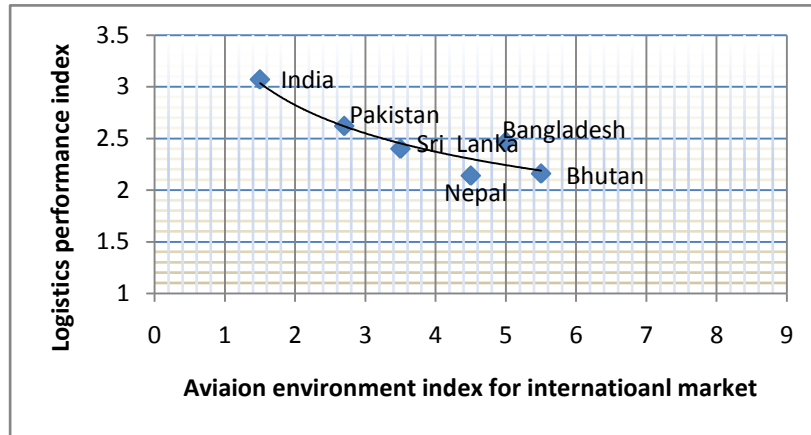


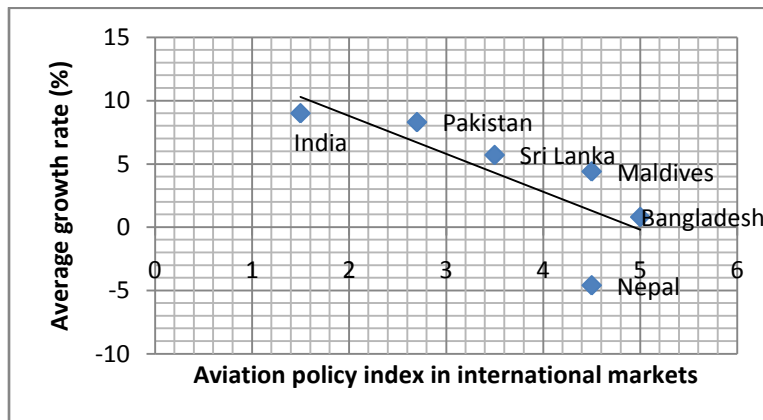
Figure 8.7: LPI and air transport restrictiveness index values in international markets



8.55 A relationship is expected between traffic flows and the policy environment, other things being equal. More restrictive regimes would be associated with smaller traffic flows. Air transport services liberalization is related to tourism in terms of international flows and domestic movements and the emergence of low-cost carriers has reinforced the links between the two activities. There may be a two-way relationship, since the prosperity of tourism will accelerate the development of the airline industry, making less likely the reversal of liberalization and the resurrection of protectionism.

8.56 Figure 8.6 presents the relationship between the annual growth rate of international arrivals since 2000 and the restrictiveness index values for the international market in the later period. Aviation policies involving fewer restrictions are associated with higher annual average tourist arrival growth rates. Work reported in Annex D explores the link with traffic flows using econometric methods to control for the influence of other determinants of traffic growth, and the relationship apparent in Figure 8.6 appears to be significant in statistical terms.²

Figure 8.8: Average growth rate (geometric) of international arrivals (2000–2006) and international market restrictiveness index values



² More recent work by the WTO, released after this paper was first prepared, find a ‘positive and significant relationship between the volumes of traffic and the degree of liberalisation in the air transport market’. See Piermartini and Rousova (2008).

E. REFORM PATHS AND IMPACTS

8.57 We observed earlier how differences in ownership structures could affect performance and the distribution of the impacts of restrictive policies between rent and cost. However, the success of private carriers such as Jet Airways does not mean all private carriers have been successful. Some, such as GMG and Airblue, have won popularity in their domestic markets, but their fleets are small with only five to six aircraft in operation; others are struggling for survival. The restrictions on their operations on international routes are part of the problem. Further liberalization in the aviation sector would provide more opportunities for them to grow and to compete and thereby add to the performance of the markets. The removal of impediments to entry in domestic markets, including those applying to foreign carriers, would add to competitive pressures.

8.58 A method of achieving these results, and at the same time removing impediments to entry by at least some foreign suppliers, is to negotiate more open skies agreements, including giving attention to domestic market entry conditions.³ What are the priorities for implementation of that approach? What are the impediments to its implementation? Are there policy packages that might be considered valuable complements to liberalization in this sector? What would be some of the consequences of success? These are the questions of interest in this section.

F. REGIONAL GROUPINGS

8.59 The most important criterion to be applied to the design of open skies initiatives is the significance of distortions in the markets and the contribution to economic welfare of their removal, which we proxy by the expected growth in traffic. This does not preclude policy initiatives in markets where traffic volumes are already relatively high. Even in those markets, there may be scope for further growth in traffic. Markets that are already large have the further advantage of providing scope for immediate entry by new providers, including privately owned firms. There is additional value from this perspective in seeking integration of domestic and international markets.

8.60 A second consideration is the ability to achieve a large scale of operations and to realise the benefits of the economies of density through the ability to construct efficient networks. Optimal airline network designs need not correspond to national borders (hub and spoke systems, for example) and the current system of bilateral agreements constrains airline network construction. Again, construction of networks across domestic and international routes should be facilitated.

8.61 A third consideration is the scope to reorganize the airline business. The following is a summary by Lafourcade and Thisse (2008) of results of Robert-Nicoud (2008) with respect to fragmentation and outsourcing.

³ Generally, airlines of economies not party to the open skies agreement do not have access to its conditions. In that sense these agreements are not accurately described as being 'open': they remain discriminatory.

Robert-Nicoud (2008) stresses a different aspect of the fragmentation process, which allows firms to simultaneously reap the benefit of agglomeration economies in the core regions and of low wages in the periphery. Specifically, the reduction of employment in some routine tasks in rich regions helps sustain and reinforce employment in the core competencies of firms in such regions. Consequently, the loss of some (unskilled) jobs (allows the retention of) firms' "core competencies" in the core regions as well as the corresponding (skilled) jobs. By contrast, preventing firms to outsource abroad their routine tasks is likely to induce them to relocate their entire activities in the periphery, thus destroying all jobs in what was the core.

8.62 Removal of the impediments through the reform process and the relaxation of ownership rules allows airlines to benefit from the process of fragmentation and sourcing inputs and services from locations outside their headquarter location. With emerging wage differences in South Asia, the benefits to the airlines from this reorganisation may be significant. The gains to regions that participate in the relocation of activities may also be significant. The design of open arrangements might then deliberately consider the interests of economies with "lagging regions" that might participate in this process.

8.63 It is also noticeable in Table 8.3 that a large percentage of flights operate within the South Asian region. Therefore, with respect to the network design criterion, the first step is to consider a regional and plurilateral open skies arrangement in the whole South Asia region.

8.64 The South Asian Association for Regional Cooperation (SAARC), established in 1985 by India, Pakistan, Bangladesh, Sri Lanka, the Maldives, Nepal and Bhutan, resulted in the South Asian Free Trade Area (SAFTA) pact in Islamabad in 2004. The free trade area came into effect on 1 January 2006. The implementation of FTA calls for cooperation in improving the transport infrastructure in road, rail, air and port networks in South Asia. The model of reform discussed by Forsyth et al. (2006) in the ASEAN case could be applied.

8.65 India is a dominant power in many respects in SAARC, and others in the region are uneasy about the distribution of the benefits of regional cooperation (Thapar 2006). For example, the smaller countries in particular are concerned about India's control over their world trade and transit links (Schaffer and Schaffer 1998). Mechanisms for dealing with these perceptions of risk in regional cooperation will be valuable.

8.66 Sub-regional and bilateral talks aimed at liberalizing trade more broadly may provide part of the solution. There have been some initiatives, including the Bangladesh–Bhutan–India–Nepal Growth Quadrangle Initiative (BBIN–GQ), Bangladesh–India–Sri Lanka–Thailand Economic Cooperation (BIST–EC), India–Bhutan Economic Cooperation, India–Nepal Economic Cooperation and Pakistan–Nepal agreement (Otsuki and Wilson 2007). Free trade agreements signed in this region include the Pakistan–Sri Lanka FTA, India–Bangladesh FTA and the Sri Lanka–Maldives FTA.

8.67 Open skies arrangements could be negotiated in similar ways on a bilateral basis at the initial stage, but subject to principles of openness that we discuss below. Again, the issue is the distribution of benefits. It might be assumed that the benefits would be concentrated in India, which has a more open arrangement, and thus some smaller countries might resist participation. For example, only Sri Lanka has a relatively liberal bilateral agreement with India. Pakistan has said it would discuss such an agreement but there has been no progress on this agreement although a new aviation policy under consideration may change this situation.

8.68 India, however, is also the source of gains from reform for other countries in the region. With respect to activities that are complementary to air transport, a regional agreement that leads to policy reform is likely to have a significant effect on the costs of travel, according to the material on the impact of reform discussed in this paper. A South Asian regime would therefore be expected to lower fares relative to routes outside the region. Local tourists would be likely to switch to destinations within the region. The impact could be significant, in the context of the expected growth of outbound tourism from India for example.⁴ A South Asia reform program provides an opportunity for the tourist sectors in other economies to “bid” for travel out of India.

8.69 Options for the integration of air transport markets beyond South Asia are worth attention, for the purposes of achieving gains of the types listed above and the larger likelihood of a greater scale of benefits, as well as providing some countervailing participation by other larger countries at the negotiating table. Table 8.5 shows the significance of flights to the Middle East and Southeast Asia from South Asia. These data prompt the suggestion that South Asia should seek new arrangements with those two regions and indeed could act as an “air bridge” (that is, leading the establishment of a larger club of countries) between regional arrangements in both those areas. The changing policy environment in all three regions adds to the opportunities for South Asia to play that role.

8.70 In 2004, ASEAN members adopted the Roadmap for Integration of the Air Travel Sector (RIATS) with the aims “to advance the full liberalization of air transport services in ASEAN, to achieve the ASEAN Leaders’ vision of Open Sky in the ASEAN region”.⁵ In line with the RIATS, open skies policy will be implemented by 2015 as part of the ASEAN Single Aviation Market. The full liberalization will be achieved through a staged and progressive approach. The RIATS encourages two or more members to negotiate and sign liberal bilateral or multinational agreements on a sub-regional basis in the move to full liberalization among all the members. A full discussion of ASEAN open skies program can be found in Findlay (2005) and Forsyth et al. (2006).

⁴ According to E.K. Bharat Bhushan, joint secretary in the tourism ministry, “outbound tourism [is] growing at an annual rate of around 25 percent with the country’s growing middle class spending more and more on foreign travel”. “Outbound tourism from India is increasing steadily with 8.34 million Indian tourists travelling overseas in the year 2007. The figure is likely to reach 50 million by 2020.” <http://overseasindian.in/2008/may/news/20080805-110255.shtml>

⁵ See <http://www.aseansec.org/16666.htm>.

8.71 There have also been calls by the air transport sector for similar arrangements in the Middle East.⁶ A dialogue with both the Middle East and East Asia at the same time as South Asia designs its own regional arrangements would be important for the implementation of the open club principles.

8.72 The agreement between the US and the EU on air transport⁷ is significant in this context. It demonstrates that region-to-region negotiations can be concluded. It will also create spillover effects into other regions through impacts on the efficiency of carriers of both regions, which will be another motivation for liberalization and improved airline performance across Asia. Finally, the terms of that agreement provide a relevant benchmark for an Asian arrangement (subject to its consistency with the principles identified below).

G. PRINCIPLES AND COMPLEMENTARY MEASURES

8.73 In this section we discuss complementary policy measures that add to the probability of successful reform in air transport.

8.74 As already noted, air cargo services are important in the design and operation of supply chains for manufactured goods. For example, it is competitive for goods where transit time is important, or where security matters (for high unit-value items) and flexibility is important (e.g., to meet unexpected shifts in demand). The reform process lowers transport costs across a network. Leinbach and Bowen stress the importance of the air cargo services package, including logistics, but the literature on the new economic geography (Lafourcade and Thisse 2008) provides further insights. Firms are interested in fragmenting their production to take advantage of differences in labor costs, for example. In the management of fragmentation, transport and communications costs both matter. Fujita and Thisse (2006) find (following the review of Lafourcade and Thisse 2008) that:

- when communication costs are high, reducing transport costs actually concentrates activity in the core; that is, the reduction in transport costs works against fragmentation,
- when communications are sufficiently low, a fall in transport costs leads to a relocation out of the core, and below some threshold this process occurs quickly over a small range of transport costs.

8.75 These results suggest that the value of a package of reforms is important. That is, not only transport (in all modes) as well as complementary logistics activities but also communications policy matters when building supply chains in a region. Giving attention only to transport costs without paying any regard to communications and these other services might strengthen the existing core rather than disperse production. This point reflects some of the concerns of the smaller economies in the South Asian grouping.

⁶ www.meed.com/news/2008/06/airlines_call_for_regional_open_skies_agreement.html.

⁷ See <http://www.state.gov/p/eur/rt/eu/c21824.htm>.

8.76 Pursuing further bilateral or regional open skies arrangements, removing barriers to entry by new providers into international and domestic routes, and including the domestic private carriers as designated carriers on international sectors will create challenges for the existing carriers. Findlay (2005) discusses a set of complementary policy reforms designed to

- support the process of adjustment by the national carriers and ameliorate the resistance to reform that has been evident so far in reform programs in South Asia, and
- respond to some important public policy concerns about the impact of liberalization and new issues that might arise.

8.77 These complementary measures include attention to ownership rules that have already been discussed. New rules help to raise funds and facilitate adjustment, including outsourcing. In addition, valuable complementary measures include

- the treatment of state aid, since governments remain concerned about the provision of services on smaller routes,
- competition policy, which may be challenged by mergers and acquisitions in a more open regime, and
- consumer protection, since more intense competition adds to the risk of failure.

8.78 A final point of attention in the reform package is the rules of the design of the open arrangements. There are some risks, for example, that new arrangements will set up a larger market but that this will be closed to those outside its formation. Regional open skies, in the extreme, may simply protect inefficiency (monopoly power, for instance) in a larger space. It will be important to design any new plurilateral agreement to avoid this risk.

8.79 Principles of pursuing an open regime are laid out in Lawrence (2006) and other work on variable geometry in regional trading arrangements, which provides an argument for the club approach to reform discussed here, but with the application of the following principles:

- all potential members be involved in the design of the constitution of the arrangement but need not join immediately,
- new members should be allowed to join if they are willing to accede to the rules of the club (not by negotiation with existing members),
- dispute settlement processes be set up but with the application of sanctions only within the set of measures of the club, and
- capacity building be provided (for example, on competition policy and the design of policy on state aid and community service obligations).

H. CONCLUSION

8.80 Air transport is an intermediate input in a large range of other goods and services transactions. Air transport is clearly complementary to other services such as tourism but also many other service providers operate internationally in a way that requires the movement of staff. Production networks in goods such as electronics are large users of air transport services.

8.81 This chapter presented the air transport activity in South Asia and then reviewed the aviation policy trend in the seven countries. Indices were created to summarize the features of the civil aviation environment of each country. Further investigations in this study reveal inverse relationships between policy restrictiveness and the logistics performance, traffic flows and international tourist arrivals. In general, liberal aviation policy promotes the growth of the movements of goods and people, including not just tourist arrivals but also outbound internationally mobile workers.

8.82 A number of policy measures were discussed. There is value in a focus on ownership reform. There are returns to extending the coverage of bilateral open skies agreements, with provision for designation of private carriers. These agreements are even more valuable if they are embedded in a regional agreement, such as one encompassing South Asia, because of its additional contribution to efficient network design, to achieving economies of scale and density, and also the scope for competition through third country entry to particular routes.

8.83 The suggestion was also made that South Asia, given the patterns of its current traffic flows, could set up an “air bridge” between regional arrangements in the Middle East and ASEAN. Principles for the openness of plurilateral arrangements indicate that South Asia should in any case be designing its own regional initiative in ways consistent with its subsequent extension or amalgamation.

8.84 Complementary to a regional initiative would be a concurrent transregional dialogue on the routes for air transport reform. It is valuable to complement open skies strategies at bilateral or regional level with a policy on refinancing the national carriers, as well as attention to competition policy, to the provision of state aid and to consumer protection issues.

8.85 There are in addition important complementarities between reform in this sector and those in other services sectors, particularly communications but also logistics. The experience elsewhere is that access to a package of services facilitates participation in global production networks.

ANNEX A: TRAFFIC AND AIRCRAFT MOVEMENTS IN MAJOR SOUTH ASIAN AIRPORTS

DHAKA

Traffic (in millions)	2003	2002	2001	2000	1999
Domestic passengers	0.601	0.603	0.557	0.402	0.566
International passengers	2.460	2.346	2.240	2.112	1.923
Terminal passengers	3.061	2.949	2.796	2.515	2.489
Transit passengers	0.001	0.000	0.001	0.002	0.001
Total passengers	3.062	2.949	2.797	2.516	2.490
Freight (in thousands)					
Domestic freight	0.5	0.6	0.6	0.5	0.6
International freight	103.2	95.7	93.9	110.7	85.3
Total freight	103.7	96.3	94.5	111.2	85.9
Mail	1.3	1.3	1.4	1.4	2.0
Aircraft Movements					
Total commercial movements	29,896	29,445	29,474	31,832	30,177
Other	5,581	8,526	10,003	12,460	12,482
Total movements	35,477	37,971	39,477	44,292	42,659

DELHI INDIRA GANDHI INTERNATIONAL

Traffic (in millions)	2007	2006	2005	2004	2003
Domestic passengers		12.957	9.569	7.445	5.748
International passengers		6.174	5.292	4.519	3.945
Terminal passengers		19.131	14.861	11.964	9.693
Transit passengers		0.242	0.228	0.246	0.234
Total passengers	23.333	19.373	15.089	12.210	9.927
Freight (in thousands)					
Domestic freight		113.0	109.6	103.7	87.1
International freight		273.1	267.4	229.6	199.3
Total freight	433.0	386.1	377.0	333.3	286.5
Mail		12.3	11.6	10.5	10.2
Aircraft Movements					
Passenger aircraft		176,718	142,224	117,883	100,908
Total commercial movements		176,718	142,224	117,883	100,908
Other		15,773	15,367	15,345	14,489
Total movements	225,510	192,491	157,591	133,228	115,397

MUMBAI/BOMBAY INTERNATIONAL

Traffic (in millions)	2007	2006	2005	2004	2003
Domestic passengers		14.185	10.819	9.245	7.632
International passengers		6.561	5.989	5.353	4.658
Terminal passengers		20.746	16.808	14.598	12.290
Transit passengers		0.629	0.601	0.581	0.529
Total passengers	25.236	21.375	17.409	15.179	12.819
Freight (in thousands)					
Domestic freight		148.0	140.8	119.6	88.3
International freight		317.7	281.5	266.8	228.4
Total freight	536.4	465.7	422.3	386.4	316.6
Mail		12.9	12.6	13.6	17.3
Aircraft Movements					

Passenger aircraft		195,411	163,946	149,602	133,566
Total commercial movements		195,411	163,946	149,602	133,566
Other		10,680	9,604	10,790	9,505
Total movements	236,620	206,091	173,550	160,392	143,071

BANGALORE INTERNATIONAL

Traffic (in millions)	2007	2006	2005	2004	2003
Domestic passengers		6.258	4.285	3.292	2.580
International passengers		1.163	0.790	0.642	0.428
Terminal passengers		7.421	5.075	3.934	3.008
Total passengers	9.924	7.421	5.075	3.934	3.008
Freight (in thousands)					
Domestic freight		67.2	53.6	47.8	42.6
International freight		96.6	77.5	58.1	43.9
Total freight	174.8	163.8	131.1	105.9	86.5
Mail		1.6	2.2	2.0	2.0
Aircraft Movements					
Passenger aircraft		87,416	63,541	55,194	42,975
Total commercial movements		87,416	63,541	55,194	42,975
Other		11,909	14,562	15,146	14,570
Total movements	123,143	99,325	78,103	70,340	57,545

MALE INTERNATIONAL

Traffic (in millions)	2007	2006	2005	2004	2003
Domestic passengers		0.492	0.353	0.601	0.420
International passengers		1.477	1.015	1.426	1.272
Terminal passengers		1.968	1.368	2.027	1.692
Transit passengers		0.130	0.147	0.144	0.121
Total passengers	2.591	2.098	1.516	2.170	1.813
Freight (in thousands)					
Domestic freight		0.3	0.3	0.3	0.3
International freight		44.2	37.3	33.8	28.3
Total freight	37.1	44.4	37.5	34.2	28.6
Mail		0.1	0.1	0.1	0.1
Aircraft Movements					
Passenger aircraft		68,090	13,189	14,245	11,693
Cargo aircraft		580	432	484	414
Total commercial movements		68,670	13,621	14,729	12,107
Other		9,247	42,495	58,313	47,530
Total movements	88,308	77,917	56,116	73,042	59,637

COLOMBO – BANDARANAIKE INTERNATIONAL

Traffic (in millions)	2007	2006	2005	2004	2003
International passengers		4.798	4.326	4.070	3.233
Terminal passengers		4.798	4.326	4.070	3.233
Total passengers	4.899	4.798	4.326	4.070	3.233
Freight (in thousands)					
International freight		170.9	160.1	146.9	124.5
Total freight	164.8	170.9	160.1	146.9	124.5
Mail		1.2	1.2	1.1	1.1

Aircraft Movements					
Passenger aircraft		33,189	33,110	30,709	22,525
Total commercial movements		33,189	33,110	30,709	22,525
Other		8,528	7,626	4,452	5,412
Total movements	42,878	41,717	40,736	35,161	27,937

KARACHI

Traffic (in millions)	2006	2005	2004	2003	2002
Domestic passengers	3.055	2.768	2.332	2.182	2.003
International passengers	2.994	2.829	2.356	2.036	2.046
Terminal passengers	6.049	5.597	4.688	4.218	4.050
Transit passengers	0.078	0.062	0.062	0.063	0.097
Total passengers	6.127	5.658	4.750	4.281	4.147
Freight (in thousands)					
Domestic freight	54.1	53.2	44.4	45.0	38.8
International freight	135.8	126.3	112.7	106.5	96.3
Total freight	189.9	179.4	157.1	151.5	135.1
Mail	1.9	2.1	3.3	2.7	4.4

Aircraft Movements

Passenger aircraft	50,259	49,283	44,005	37,116	36,936
Total commercial movements	50,259	49,283	44,005	37,116	36,936
Other	7,834	9,038	11,498	12,062	10,657
Total movements	58,093	58,321	55,503	49,178	47,593

LAHORE

Traffic (in millions)	2006	2005	2004	2003	2002
Domestic passengers	1.462	1.381	1.175	1.102	1.018
International passengers	1.632	1.491	1.336	1.178	1.062
Terminal passengers	3.094	2.872	2.511	2.281	2.081
Transit passengers	0.095	0.104	0.104	0.091	0.104
Total passengers	3.189	2.976	2.615	2.371	2.185
Freight (in thousands)					
Domestic freight	31.1	32.8	26.5	24.9	20.7
International freight	48.8	52.5	45.7	37.8	35.9
Total freight	79.9	85.3	72.2	62.7	56.5
Mail	0.7	0.9	3.3	1.9	3.5

Aircraft Movements

Passenger aircraft	28,591	27,716	24,654	21,935	20,680
Total commercial movements	28,591	27,716	24,654	21,935	20,680
Other	15,184	21,257	20,763	11,686	13,638
Total movements	43,775	48,973	45,417	33,621	34,318

Source: Air Transport Intelligence.

ANNEX B: AIR INDIA AND INDIAN AIRLINES

Carriers	Air India					Indian Airlines				
	2006	2005	2004	2003	2002	2006	2005	2004	2003	2002
Period start	01/04/06	01/04/05	01/04/04	01/04/03	01/04/02	01/04/06	01/04/05	01/04/04	01/04/03	01/04/02
Period end	31/03/07	31/03/06	31/03/05	31/03/04	31/03/03	31/03/07	31/03/06	31/03/05	31/03/04	31/03/03
Passenger revenue (US\$ in millions)	na	1,284.23	1,124.75	na	782.84	na	1,063.00	na	804.90	676.34
Total revenue (US\$ in millions)	2,039.67	2,087.09	1,660.13	1,288.35	1,143.04	na	1,301.75	1,193.43	1,015.82	842.43
Net profit (US\$ in millions)	-98.90	3.37	21.44	20.17	21.86	-60.84	11.18	14.60	9.65	-40.67
Net margin	-4.84%	0.16%	1.29%	1.56%	1.91%	na	0.85%	1.22%	0.94%	-4.82%
Passenger s(in millions)	4.390	4.360	4.250	3.780	3.450	8.310	7.600	6.930	6.930	5.650
Passenger load factor	63.81%	66.24%	69.09%	69.66%	70.8%	67.97%	66.09%	63.9%	63.9%	59.54%
Employees	15,884 (2005)					18,219 (2005)				
Fleet (in service)	38 (2005)					55 (2006)				
Number of destinations served	38(2006)					53(2006)				
Passenger revenue per passenger	294.5 (2005)					139.9 (2005)				
Employee productivity (US\$ million)	0.13 (2005)					0.07(2005)				
Employees per aircraft	418 (2005)					331 (2005)				

Source: Air Transport Intelligence and Directorate General of Civil Aviation of India. Where there is discrepancy, we report the latter's statistics.

Biman and Sri Lankan

Carriers	Biman (Bangladesh)					Sri Lankan				
	2006	2005	2004	2003	2002	2006	2005	2004	2003	2002
Period start	01/01/06	01/01/05	01/01/04	01/01/03	01/01/02	01/04/06	01/04/05	01/04/04	01/04/03	01/04/02
Period end	31/12/06	31/12/05	31/12/04	31/12/03	31/12/02	31/03/07	31/03/06	31/03/05	31/03/04	31/03/03
Passenger revenue (US\$m)	na	276.60	271.72	239.05	na	na	473.43	420.36	373.51	297.59
Total revenue (US\$m)	na	329.27	343.97	314.40	na	650.27	607.08	548.30	465.13	373.75
Net profit (US\$m)	na	na	12.78	-8.83	na	8.14	19.83	13.79	57.68	13.71
Net margin	na	na	3.71%	-2.8%	na	1.25%	3.26%	2.51%	12.4%	3.66%
Passengers (m)	1.150	1.470	1.550	1.470	1.550	3.180	3.010	2.420	2.070	1.810
Passenger load factor	71.45%	72.11%	70.6%	68.94%	69.77%	77.05%	75.83%	71.89%	75.08%	76.08%
Employees	5,351 (2004)					5739(2007)				
Fleet (in service)	12 (2007)					14 (2007)				
Destinations served	19 (2007)					31 (2007)				
Employee productivity (US\$m)	0.06 (2004)					0.11 (2006)				
Passenger revenue per passenger (\$)	188.2 (2005)					157.3 (2005)				
Employees per aircraft	446 (2004)					410 (2007)				

Source: Air Transport Intelligence.

PIA and Airblue

Carriers	PIA (Pakistan)					Airblue (Pakistan)	
	2007	2006	2005	2004	2003	2006	2005
Period start	01/01/07	01/01/06	01/01/05	01/01/04	01/01/03	01/01/06	01/01/05
Period end	31/12/07	31/12/06	31/12/05	31/12/04	31/12/03	31/12/06	31/12/05
Passenger revenue (US\$m)	1,020.17	1,023.27	948.70	867.63	724.45	Na	na
Total revenue (US\$m)	1,159.67	1,170.48	1,075.56	987.29	830.87	Na	na
Net profit (US\$m)	-220.46	-211.64	-74.05	39.42	22.50	na	na
Net margin	-19.01%	-18.08%	-6.88%	3.99%	2.7%	na	na
Passengers (m)	5.420	5.730	5.500	5.120	4.550	1.1	0.7
Passenger load factor	67.34 %	68.5 %	69.7 %	67.02 %	69.6 %	81%	79%
Employees	18282 (2006)					980 (2006)	
Fleet (in service)	42 (2007)					6 (2006)	
Destinations served	38 (2007)					9 (2006)	
Employee productivity (US\$m)	0.064 (2006)					na	
Passenger revenue per passenger (\$)	188.2(2007)					na	
Employees per aircraft	435 (2006)					163(2006)	

Source: Air Transport Intelligence

Jet Airways and Deccan

Carriers	Jet Airways (India)					Deccan (India)	
	2006	2005	2004	2003	2002	2006–2007	2005–2006
Period start	01/04/06	01/04/05	01/04/04	01/04/03	01/04/02	01/07/06	01/07/05
Period end	31/03/07	31/03/06	31/03/05	31/03/04	31/03/03	30/06/07	30/06/06
Passenger revenue (US\$m)	1,424.34	na	na	na	538.84	na	na
Total revenue (US\$m)	1,637.52	1,374.35	983.70	778.98	595.10	487.16	275.73
Net profit (US\$m)	61.82	102.05	87.24	35.63	na	–95.41	–75.95
Net margin	3.77%	7.42%	8.86%	4.57%	na	–19.58%	–27.54%
Passengers (m)	10.730	9.560	8.140	6.720	6.280	7.260 (01/01/07– 31/12/07)	5.550 (01/01/07– 31/12/07)
Passenger load factor	69.54 %	72 %	71.29 %	62.75 %	61.56 %	76.55 % (01/01/07– 31/12/07)	75.13 % (01/01/07– 31/12/07)
Employees	10,017 (2007)					3,065 (2007)	
Fleet (in service)	71 (2007)					31 (2007)	
Destinations served	58 (2008)					36 (2007)	
Employee productivity (US\$m)	0.16 (2006)					0.16 (2006–3007)	
Passenger revenue per passenger (\$)	132.7 (2006)					na	
Employees per aircraft	200 (2007)					98 (2007)	

Source: Air Transport Intelligence.

ANNEX C: ONLINE FARES (LOWEST ECONOMY CLASS) FROM MAJOR SOUTH ASIAN CITIES TO EUROPE, NORTH AMERICA, THE MIDDLE EAST, SOUTHEAST ASIA AND EAST ASIA ON 29/30 SEPTEMBER 2008

City pair	Airline	Fare	Tax	Total	Note
Male–London	Qatar Airways	Rs.30180	Rs.6043	Rs.36223	Indirect flight
Colombo–London	Qatar Airways	Rs.25060	Rs.4346	Rs.29406	Indirect flight
Dhaka–London	Etihad Airways	Rs.21950	Rs.5797	Rs.27747	Indirect flight
Delhi–London	Gulf Air	Rs.17089	Rs.5797	Rs.27747	Indirect flight
Islamabad–London	Gulf Air	Rs.10620	Rs.5748	Rs.16368	Indirect flight
Male–Singapore	Malaysian Airlines	Rs.9880	Rs.9267	Rs.19147	Indirect flight
Colombo–Singapore	Jet Airways	Rs.10710	Rs.7779	Rs.18489	Indirect flight
Dhaka–Singapore	Biman	Rs.12345	Rs.3972	Rs.16317	Direct flight
Delhi–Singapore	Air India	Rs. 8500	Rs.4930	Rs.13430	Direct flight
Islamabad–Singapore	Etihad Airways	Rs.15575	Rs.5924	Rs.21499	Indirect flight
Male–Bahrain	Qatar Airways	Rs.18290	Rs.5622	Rs.23912	Indirect flight
Colombo–Bahrain	SriLankan	Rs.10510	Rs.2793	Rs.13303	Direct flight
Dhaka–Bahrain	Etihad Airways	Rs.13260	Rs.3983	Rs.17243	Indirect flight
Delhi–Bahrain	Jet Airways	Rs.8000	Rs.3899	Rs.11899	Indirect flight
Islamabad–Bahrain	Etihad Airways	Rs.7210	Rs.4609	Rs.11819	Indirect flight
Male–New York	Qatar/American Airlines	Rs.83805	Rs.12848	Rs.96653	Indirect flight
Colombo–New York	Etihad Airways	Rs.32495	Rs.6627	Rs.39122	Indirect flight
Dhaka–New York	Gulf Air	Rs.33470	Rs.9931	Rs.43401	Indirect flight
Delhi–New York	Etihad Airways	Rs.18920	Rs.9580	Rs.28500	Indirect flight
Islamabad–New York	Qatar Airways	Rs.16830	Rs.9201	Rs.26031	Indirect flight
Male–sShanghai	China Eastern	Rs.30180	Rs.4695	Rs.34875	Direct fight

Colombo– Shanghai	Malaysia Airlines	Rs.13785	Rs.10836	Rs.24621	Indirect flight
Dhaka– Shanghai	Malaysia Airlines	Rs.19660	Rs.12170	Rs.31830	Indirect Flight
Delhi–Shanghai	Air China	Rs.14990	Rs.5364	Rs.20354	Indirect flight
Islamabad– Shanghai	Etihad Airways/Air China	Rs.34795	Rs.7434	Rs.42229	Indirect flight

Source: <http://cheapfaresindia.makemytrip.com>, retrieved 25 September 2008.

ANNEX D: ECONOMETRIC RESULTS ON TRAFFIC FLOWS

A multivariate regression was run to test the effect of policy reform on traffic flows. The model used is:

$$\ln \text{traffic} = \beta_0 + \beta_1 \ln(\text{GDPpc1}) + \beta_2 \ln \text{GDPpc2} + \beta_3 \text{distance} + \beta_4 \text{internationalindex} + \beta_5 \text{failingcarrierdummy} + \varepsilon$$

The dependent variable is the outbound passenger and cargo traffic flows, respectively, from the South Asian countries in 2000 and 2006; GDPpc1 is the departure country's GDP per capita while GDPpc2 is the destination country's GDP per capita; distance is the distance between two countries' capital cities. International index is the aviation environment index for international markets in the periods around 2000 and 2006; and failingcarrierdummy is a dummy variable indicating that the networks of two national carriers, Biman of Bangladesh and PIA of Pakistan, shrank significantly around 2006 owing to a financial crisis.

The sample contains the traffic of two periods, 2000 and 2006. The traffic data are from ICAO, consisting of the traffic between major international airports of two countries. If the 2006 traffic data are not available, the nearest year's data are used (for example, the traffic of 2005). The departure countries are the South Asian countries under study, and the destinations include countries in South Asia, Southeast Asia, the Middle East and Europe. The GDP data are from the International Monetary Fund while the distance can be found at the website:

<http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/Data/Gravity/dist.txt>.

Table A.1 reports the OLS results for the freight and passenger equations. The model fit measured by R^2 is not very high in either regression, so we should be cautious in using the results. However, the policy indicator variables are significant with the signs expected. Given the semi-log form, the coefficient of the aviation index may be interpreted as the percentage impact of an incremental index score on traffic flows. For example, an increase in the index by one point (more restrictive in aviation policy) results in 18 percent and 23 percent decreases in passenger and freight traffics, respectively, holding other conditions fixed.

Table A1: OLS estimation results

	Passenger traffic		Freight traffic	
	Coefficient	Std error	Coefficient	Std error
lnGDPpc1	-0.4510	0.2518	-0.9817**	0.3359
lnGDPpc2	0.3235**	0.0904	0.6311**	0.1206
Distance	-0.0003**	0.0001	-0.0002*	0.0001
internationalindex	-0.1825*	0.0764	-0.2265*	0.1019
failingcarrierdummy	-0.8876**	0.2692	-0.9784*	0.3592
Constant	13.4040**	1.9760	11.0148**	2.6361
Adjusted R ²	0.22		0.30	
F	6.55		9.14	
N	98		98	

*significant at 5%, **significant at 1%..

These results can be used to derive a price effect that is associated with changes in the level of restrictiveness. Demand for air transport is elastic. A recent IATA report referring to studies of demand elasticities reports route-level long-haul values of 1.3 in Asia (IATA 2008).¹ A meta-analysis by Brons et al. (2002) finds a mean elasticity estimate of 1.2 (SD of 0.6). Even at an elasticity value of 1, a rise in one point in the restrictiveness over current ranges has the same effect on passenger traffic as a price rise of 18 percent.

¹ See <http://www.iata.org/whatwedo/economics/index>.

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