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9

Indian Higher Education

Devesh Kapur

9.1 Introduction

If physical capital—its growth and distribution—was central to debates on economic development in the twentieth century, human capital increasingly occupies center stage (Kapur and Crowley 2008). While much of the attention has been on primary education, tertiary education is increasingly receiving greater attention. However, the very promise of higher education for developing countries is also making this a politically contentious issue. Because universities influence the minds of young adults, they have always been sites of politics. Increasingly, however, a growing awareness of the distributional implications of higher education has led to issues of access and financing becoming more salient (often at the expense of quality). Many of the underlying handicaps faced by students from lower socioeconomic groups appear to occur much earlier in the life cycle—at the primary and secondary school level—but policies to overcome these handicaps seem to be more politically expeditious in higher education. Unsurprisingly, the attention to higher education in developing countries has focused mainly on its economic effects, especially its links with labor markets. However, there is little understanding about the how the impact of higher education is mediated by the type of education and its beneficiaries.

The paper first outlines the principal characteristics of Indian higher education and its recent rapid growth, especially the number of students and

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institutions, the fields of study, and the sources of supply. The next section focuses on the key challenges facing Indian higher education resulting from a massive increase in the demand for higher education. What are the specific fields of higher education for this growing demand, and how is it being met? It then analyzes two key questions: why, despite India's robust growth and a legacy of one of the better higher education systems in developing countries, has quality deteriorated so markedly? And, second, if quality is indeed poor, then why is this not manifestly handicapping India's rapid growth? It concludes with some questions on possible nonlabor market effects of the current structure of Indian higher education.

9.2 Growth

The past quarter century has seen a massive expansion in higher education worldwide and especially in developing countries, reflecting shifting demographics, changing economic structures, and significant improvements in access to primary and secondary education. Tertiary education is a rapidly growing service sector, enrolling more than 80 million students worldwide and employing about 3.5 million people. Demand pressures have been acute, the result of a population bulge in the relevant age group, increasing enrollment in secondary education, increasing incomes (and with it the capacity to pay), and rising wage premiums accruing from higher education. Meeting this escalating demand has placed public systems and resources under severe strain. And because this demand group is more urban and vocal, it also poses major political challenges.

As countries and university systems strain under the pressure of increasing demand, new supply responses are rapidly changing the higher education landscape in most countries. The financing, provision, and regulation of higher education are witnessing two major shifts. The first is from pure public to private and mixed systems; the second is a shift from provision and regulation that has traditionally been purely domestic to greater international influence. These trends broadly mimic what has been occurring in almost all aspects of the economy. This is true in India as well—but, if anything, the trend toward the private provision of higher education is even greater.

9.2.1 Indian Higher Education: Basic Facts and Trends

In 1950 to 1951 India had twenty-seven universities, which included 370 colleges for general education and 208 colleges for professional education (engineering, medicine, education). The system has grown rapidly, especially since the mid-1980s, with student enrollment growing at about 5 percent annually over the past two decades. This growth is about two-and-half times the population growth rate and results from both a population bulge in lower age cohorts as well as increased demand for higher education. The gross

enrollment ratio in higher education is approximately 11 percent of the age cohort with women constituting about 40 percent of enrollments.

By end 2008, India had 449 universities—265 state universities, 25 central universities, 121 deemed-to-be universities (also known as "deemed universities"), 33 institutes of national importance established under Central Legislation and 5 institutions established under legislations by various state legislations.[1] In addition, there were 22,064 colleges. At the beginning of the academic year 2008 to 2009, the total number of students enrolled in universities and colleges was about 12.4 million. Of this 1.6 million (13 percent) were enrolled in university departments and 10.8 million (87 percent) in affiliated colleges. Women comprised 40.5 percent of total enrolment.

The number of doctoral degrees awarded by various universities in 2006 was 20,131. Out of the total number of doctoral degrees awarded, faculties of arts had the highest proportion followed by the faculties of science. These two faculties together accounted for over 70 percent of the total number of doctoral degree awarded. In contrast, the number of engineering PhDs is about a thousand—less than one per engineering college. The number of faculty was about half million, of which 16 percent was in universities and the rest in the affiliated teaching colleges.

The bulk of students (nearly two-thirds) are enrolled in arts and science, with another one-sixth in commerce/management. Recent growth has been much greater in technical education (engineering, management, pharmacy) and professional education (medicine, teacher training, and law), as well as in private vocational courses catering especially to the information technology (IT) sector (table 9.1). The private sector has accounted for the bulk of recent supply as cash-strapped state governments have virtually ceased to expand the list of government aided institutions, thereby increasing the percentage of "self-financed" or "private unaided institutions," most noticeably in professional and technical education (Agarwal 2006; Kapur and Mehta 2007). The vast majority of these, however, are affiliated to public universities whose role is increasingly an affiliation and degree granting one rather than teaching or research. Consequently, enrollment at public universities is still almost a hundred fold that of private universities, principally because of onerous entry regulations on the latter.

These private institutions are helping to meet the growing demand that the public sector cannot. Private institutions are less subject to political instabilities and day-to-day political pressures that often bedevil public institutions in developing countries. They are also more nimble and able to respond to changes in demands from employers and labor markets. Yet despite these positives, these institutions are of highly variable—and

1. Deemed-to-be-universities are an institutional innovation that may be *sui generis* to India. These institutions have narrow domains but can grant degrees. The original criterion was that they should be engaged in research and teaching in chosen fields of specialization that were innovative and of very high standards.

Table 9.1 Higher education in India: technical education intake capacity

	No. of students	No. of Institutions
Engineering (degree)	627,082	1,617
Engineering (diploma)	333,296	1,403
Business Management	104,084	1,150
Master's in Computer Applications	56,004	999
Hotel Management and Catering Technology	5,229	80
Pharmacy	44,476	736
Architecture	4,707	116
Fine Arts	650	9

Source: Government of India, Ministry of Human Resource Development. Data are from July 31, 2007.

often dubious—quality. They are mostly teaching shops, and very rarely knowledge-producing institutions. Although most private provision occurs domestically, there is a small but growing trend toward international private provision.

The public-sector supply, which has been stagnant since the early 1980s, is, however, poised for significant expansion if the targets announced for the XI plan (2007–2008 to 2011–2012) come to pass. It has targeted a gross enrollment ratio (GER) of 15 percent (21 million students), implying an annual growth rate of nearly 9 percent or an additional enrolment of 870,000 students in universities and about 6 million in colleges in the next five years. To this end, the central government intends setting up and funding thirty new central universities across the country, has ambitious plans in "technical education," and intends supporting state governments to set up colleges in the 340 districts that have extremely low college enrolments.[2] In December 2008, the Indian parliament passed a bill establishing a science and engineering research board (SERB) to serve as the apex research agency for planning and supporting research. Ideally, such a body would identify research priorities and then fund researchers (and their institutions) through a competitive grant process. A host of funding initiatives has also been announced that follow the student instead of the institution.[3] By providing merit scholarships to 2 percent of total students in higher education, the government hopes that universities will have an incentive to compete and attract students

2. This includes setting up eight (new) India institutes of technology (IITs), seven India institutes of management (IIMs), five India institutes of science and engineering research (IISERs), two schools of planning and architecture (SPAs), ten national institutes of technology (NITs), twenty India institutes of information technology (IIITs), and fifty centers for training and research in frontier areas.

3. Schemes under the Innovation in Science Pursuit for Inspired Research (INSPIRE) launched in XI Plan include (a) Scheme for Early Attraction of Talents for Science (SEATS), (b) Scholarships for Higher Education (SHE), (c) Assured Opportunity for Research Careers (AORC).

rather than have all their costs covered. And in order to increase the pool from which universities will be able to draw students, in late 2008, the Indian government announced a new $5 billion program to boost secondary school enrolment from just above half to 75 percent within five years.[4]

9.3 Quality

The prevailing view regarding higher education in India is discouraging: by most quality indicators, Indian bachelor's, master's, and PhD programs are lagging behind domestic demand in terms of required quality of graduates. There are numerous studies that detail both the need for better higher education in the country and the challenges in recruiting a scientifically competent workforce. According to the prime minister, the Indian university system "is, in many parts, in a state of disrepair . . . In almost half the districts [340] in the country, higher education enrolments are abysmally low, almost two-third of our universities and 90 per cent of our colleges are rated as below average on quality parameters . . . Its erstwhile Human Resources Development (HRD) Minister (who is responsible for higher education), called higher education the 'sick child of education.'[5]

Various indicators employed to study the quality of higher education in India, such as research output, infrastructure, and placement of graduates, point to the need for reform in the higher education public and private sector. In the Times Higher Education World University Rankings 2008, of the top 200 universities, two were Indian: the Indian Institute of Technology, Delhi, and the Indian Institute of Technology, Bombay.[6] And the Academic Rankings of World Universities by Shanghai Jiao Tong University ranked only two Indian universities in the top 500 (Indian Institute of Technology, Kharagpur and the Indian Institute of Science, Bangalore, both between 303 and 401).[7] Note that even the handful included in these rankings is dominated by engineering- and technology-specific institutions, a sorry testament to the extreme weakness of broad-based universities in the country.

In science and engineering, the part of Indian higher education that has grown most rapidly in recent years, India produced three times more graduates than the United States in 2006 (table 9.2). Various industry surveys

4. The program called the *Rashtriya Madhyamik Shiksha Abhiyan* aims at providing additional enrollment of 3.2 million through strengthening of about 44,000 secondary schools and opening 11,188 new secondary schools and appointment of 179,000 additional teachers and construction of 88,500 classrooms.

5. Prime Minister Manmohan Singh's address at the 150th Anniversary Function of University of Mumbai, June 22, 2007, http://pmindia.nic.in/lspeech.asp?id=555; Arjun Singh, cited in http://inhome.rediff.com/news/2007/oct/10arjun.htm.

6. Data available at http://www.timeshighereducation.co.uk/hybrid.asp?typeCode=243&pubCode=1.

7. Data available at http://www.arwu.org/rank2008/EN2008.htm.

Table 9.2 **Science and engineering higher education in China, India, and the United States**

	India (2006)	China (2003)	United States (2006)
Bachelors	237,000	351,500	74,200
Masters	20,000	35,000	39,000
Doctorates			
Science	5,500	32,000	14,200
Engineering	1,000	4,300	8,400
Total	6,500	36,300	22,600
Masters/Bachelors (%)	8.4	10	52.6
Doctorates/Bachelors (%)	0.4	1.2	11.3
Bachelors per million population	214	272	246
No. of institutions	1,511	n.a.	4,314[a]
Faculty	67,000	n.a.	26,700
Publications in science and engineering (2003)	12,774	60,067	211,233

Sources: Banerjee and Muley (2007). For China, data taken from Vivek Wadhwa, Duke Outsourcing Study: Empirical Comparison of Engineering Graduates in the U.S., China, and India, 2005.

Notes: Data are from most recent year available.

[a]Taken from http://nces.ed.gov/programs/coe/2008/analysis/sa_table.asp?tableID=1053.

indicate that about a fifth of these are of comparable standards to their U.S. counterparts. The contrast is most stark in the number of PhDs. Between 1985 and 2002, the ratio of the number of PhDs to bachelors degrees in India dropped from 2.2 percent to just 0.66 percent, while it doubled in the United States from 4.1 percent to 8.4 percent (table 9.3). The annual number of PhD engineers produced in India around 2005 was about half per engineering school per year.

The contrast with China is stark. In the last two decades, the number of PhDs in science and engineering (S&E) in India increased by around 50 percent (from 4,007 in 1985 to 6,318 in 2003), whereas in China, the numbers increased from a tiny 125 in 1985 to 12,238 in 2003 and 14,858 in 2004 (see figure 9.1). According to one analysis, in 1990, publications from India were about 50 percent more than China. Over the next fifteen years, publications from India increased 40 percent. The increase from China was nearly sixfold, a number more than double compared to India (see figure 9.2).

The problems are even more acute in the social sciences. The number of PhDs produced by India's premier economics faculty—Delhi School of Economics—has dropped from about 4.5 a year in the 1970s and 1990s to barely 1.5 a year in this decade. This is despite the fact that the number of economics departments in Indian universities grew from 72 in 1971 to 119 in 2001. As a recent official review of Indian social sciences put it, "an even more serious problem [than funding] is the severe, and increasing, shortage, of qualified researchers. Even research institutes and universities that have

Table 9.3 **Ratio of engineering PhDs to bachelors engineering degrees**

	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001	2002
India	2.21	2.13	2.03	n.a.	n.a.	0.58	0.4	0.93	0.87	0.83	0.66
China	0.09	0.15	0.65	0.67	0.88	1.11	1.51	1.67	2.11	1.98	n.a.
United States	4.08	4.99	6.79	8.38	9.09	9.48	9.81	n.a.	8.94	9.28	8.36

Source: Banerjee and Muley (2007), "Engineering Education in India," Observer Research Foundation Report. Data from tables 1.10, 1.11 and 1.12.

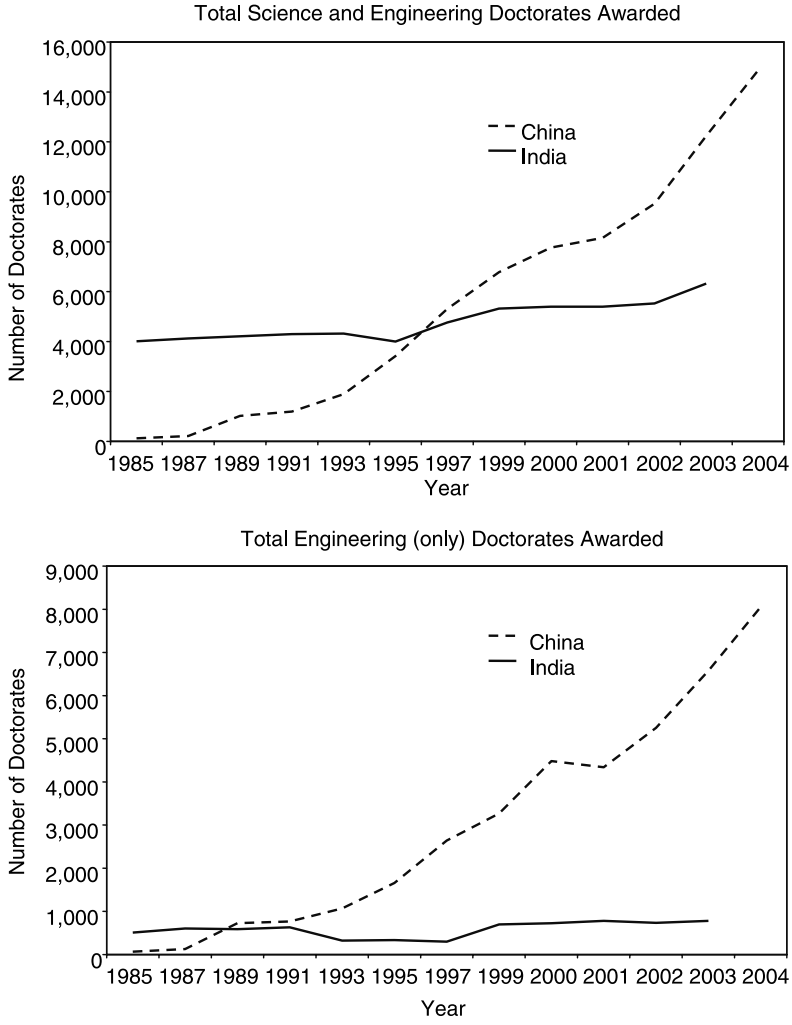

Fig. 9.1 **Science and engineering doctoral degrees: Selected years, 1985–2005**
Source: NSF, *Science and engineering indicators, 2008,* appendix table 2-43.

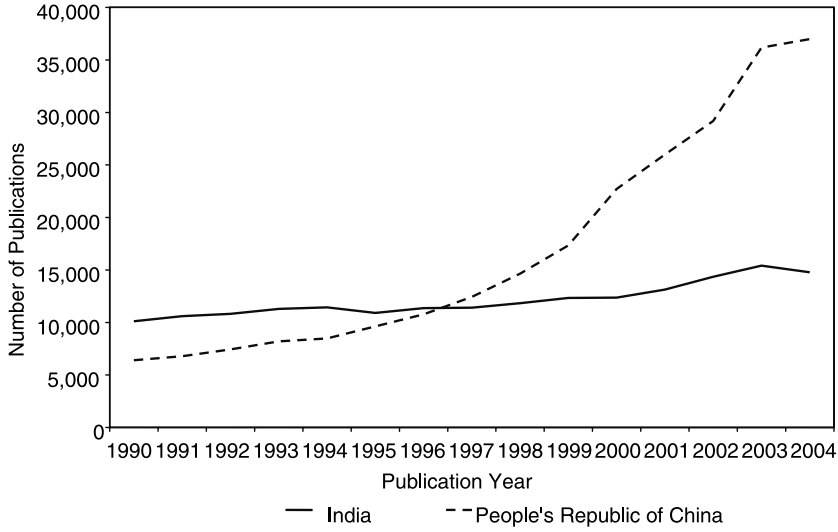

Fig. 9.2 Publication productivity of India and China
Source: Kademani, Sagar, and Kumar (2006).

a good reputation for quality are faced with a decline in both the number and quality of Ph.D. students."[8]

The shortage of faculty is ubiquitous across fields. According to a survey by the Pay Review Commission of the University Grants Commission, 44.6 percent of sanction positions of lecturers at the university level and 41 percent at the college level were vacant.[9] In December 2008, the Indian government approved a pay hike of 70 percent for the nearly half a million faculty in universities and colleges across India. However, while this measure will help, it does not address the core questions of governance, which is the central reason for the weaknesses of Indian higher education and even more of a deterrent to attracting talent.

The poor quality of Indian higher education is evident in the results of the Indian administrative service exams. The applicants to posts ratio (APR), an index of the number of candidates aspiring for civil service posts through various examinations is an astounding *755* candidates for every post filled (for 2005). Even then, suitable candidates are not found, and positions are left unfilled (table 9.4). More than 5,000 candidates applied for just thirty positions for the Indian Economic Service/Indian Statistical Service through civil services examinations. Even then, barely twenty-three made the grade.

8. The Indian Council of Social Science Research, "Restructuring the Indian Council of Social Science Research," Report of the Fourth Review Committee, March 2007, 22.

9. University Grants Commission, *Report of the Committee to Review the Pay Scales and Service Conditions of University and College Teachers,* 2008.

Table 9.4 Indian civil service exams

Name of examination	No. of posts	No. of applicants	No. of recommended candidates	APR	RPR
Civil Services	457	345,106	425	755	0.93
Engineering Services	262	74,363	229	284	0.87
Combined Medical Services	624	28,878	562	46	0.90
Central Police Forces	256	92,568	224	362	0.88
Indian Economic Service/ Indian Statistical Service	30	5,017	23	167	0.77
Geologists	95	3,433	95	36	1.00
Total	1,724	549,365	1,558	319	0.90

Source: Union Public Service Commission 57th Annual Report, 2006–07, table 5.
Note: APR = applicants to posts ratio; RPR = recommended to post ratio.

It should be noted that this is a different problem from the disincentives to join the public sector because of (relatively) poor pay or working conditions, which might result in fewer applications and lead the best to leave after a few years. There are clearly a very large number of students with degrees in economics and statistics who want to apply—it is just that less than half of 1 percent conform to certain standards. The result is that the Indian Statistical Service, a cadre of the federal government that over the decades has produced one of the best government statistics among developing countries, is being starved of talent with adverse consequences for the quality of government statistics. Indian newspaper editors, when queried about the main constraint facing them, say it is the lack of availability of young people who can write even two pages of correct English prose.

9.4 The Political Economy of Indian Higher Education: Why Is Quality Poor?

There are several reasons why Indian higher education, and the bulk of its universities in particular, is in a poor state. A structural reason stems from a decision made in the 1950s to create separate research institutions outside the university system. Over time, as universities became politicized, researchers fled the university system and migrated to public institutions under the umbrella of the Council of Scientific and Industrial Research (CSIR), the Department of Atomic Energy, the Indian Space Research Organization, and the Indian Council of Social Science Research (ICSSR). The bifurcation of research from teaching and the in-breeding of faculty, gradually led to an entrenchment of mediocrity. The most acute weakness plaguing India's higher education system is a crisis of governance. Indeed the Indian Prime Minister, a former professor at Delhi University, himself has commented,

"I am concerned that in many states university appointments, including that of vice-chancellors, have been politicised and have become subject to caste and communal considerations, there are complaints of favouritism and corruption." The core of the governance problem lies in the nature of highly centralized state regulation of higher education that seeks to micro-manage who can teach what to whom at what cost. Table 9.5 gives an overview of the regulatory structure of Indian higher education. Its effects on Indian higher education can be gauged by the bleak assessment of a former science and technology (S&T) minster, "There is not such a thing as UGC [University Grants Commission] there is not such a thing as AICTE [All India Council for Technical Education], there is not such a thing as MCI (in the western world). They [have] destroyed our entire efforts to take education forward."[10]

One might presume that an independent regulatory framework for any sector would shield it from the political interference. In the Indian case, they are simply another mechanism for political influence and rent-seeking. And when they do exercise regulatory independence, they are quickly overridden by the ministries even flouting the courts. To take one example: in 2003, the Supreme Court of India ruled that the Medical Council of India (MCI) was the only authority that could recommend an increase of student strength or renewal of permission for medical colleges. That order had directed the central government "not to grant any further permission without following the procedure prescribed under the Indian Medical Council Act." In 2008, the MCI denied permission to two medical colleges to take new students based on a report by a government appointed lawyer that their facilities were "inadequate."[11] The very same day the Health Ministry permitted the very two private medical colleges to take in more students!

There is sufficient awareness of the problems afflicting Indian higher education at the highest levels of the Indian government as evident by the quotes cited in the preceding by a range of key cabinet members. Why then has the Indian state not acted and addressed them? One reason may be that higher education is arguably one of the most difficult sectors to reform—and not just in India. In the case of public universities, employees (both faculty and administration) and students are among the most vocal and well-organized political groups in any country. Even as unions have weakened in virtually all aspects of economic activity, education remains a rare exception. Direct exit options—such as closing down poor performing departments or

10. Kapil Sibal, quoted in *Business Standard* July 9, 2008, http://www.business-standard.com/india/storypage.php?autono=328167. In April 2009, Kapil Sibal became the new minister for Human Resource Development, which included higher education.

11. Amitav Ranjan, "Denied SC nod for admissions, 2 medical colleges get Health Ministry OK same day," *Indian Express,* September 29, 2008, http://www.indianexpress.com/news/denied-sc-nod-for-admissions-2-medical-colleges-get-health-ministry-ok-same-day/367138/0.

Table 9.5 **Structure of higher education regulation**

Function	Institution	Purpose
Higher education policy	Central Advisory Board of Education (CABE)	Apex body that advises the central and state governments in the field of education.
Universities	University Grants Commission (UGC)	Regulates all aspects of universities and also provides funds.
All aspects of "technical education," including engineering/technology, architecture, management, hotel management & catering technology, pharmacy, and applied arts & crafts	All India Council for Technical Education (AICTE)	Maintenance of norms and standards and quality assurance through accreditation, and funding in priority areas. Except with the approval of the Council, no new technical institution or university technical department shall be started; or no course or program shall be introduced by any technical institution, university, or university department or college; or no technical institution, university or deemed university, or university department or college shall continue to admit students for degree or diploma courses or program; no approved intake capacity of seats shall be increased or varied. Approval is based on the fulfilment of certain preconditions.
Medical education	Medical Council of India (MCI), Pharmacy Council of India (PCI), Indian Nursing Council (INC), Dentist Council of India (DCI), Central Council of Homeopathy (CCH), Central Council of Indian Medicine (CCIM), Rehabilitation Council of India (RCI)	Accreditation and standards.
Legal education	Bar Council of India (BCI)	Accreditation and standards.
Teaching	National Council for Teacher Education (NCTE), Distance Education Council (DEC)	Accreditation and standards.
Agriculture	Indian Council for Agriculture Research (ICAR)	
	National Assessment and Accreditation Council (NAAC)	Assess and accredit institutions under the purview of the UGC that volunteer for the process, based on prescribed criteria.
	National Board of Accreditation (NBA)	Assess the qualitative competence of institutions in technical education approved by AICTE.

colleges—sharply increases the risks of an immediate political reaction. Visible strategies such as increasing fees are also fiercely resisted even when they could raise quality or lead to a less regressive income transfer to elites.

Public universities (and their affiliated colleges) are plagued by misguided attempts at equity, poor administration, and bureaucratization. The lack of institutional autonomy and poor academic governance has made it increasingly difficult for higher education to attract talent, especially because (unlike the past) that talent has alternatives. In many cases, talent out has been driven out, and as individuals at the upper end of human capital distribution leave, the remaining pool is of poorer quality. This not only prompts the more talented to also consider leaving, but also discourages those who left earlier from returning, ensuring that mediocrity becomes entrenched in these institutions. While low salaries are an issue, in many cases, a poor overall academic environment is perhaps more important. In most government institutions, the focus is on process rather than performance, appointments are politicized, and autonomy in administration, financial, and academic content is minimal. Resources are an undoubted constraint, but more flexible rules, access to modest research resources, and a work environment that encourages innovative practices and research can achieve much.

Consequently, changes have occurred largely because the majority of public institutions focus on liberal arts programs, which have deteriorated to such an extent as to force students to seek private-sector alternatives. In other cases, fiscal constraints have limited public-sector led supply increases, resulting in increasing rationing as demand escalates, thereby forcing excess demand to spill over to a burgeoning private sector. The latter largely focus on technical and professional education and, as I note later, are also plagued by poor quality and corrupt practices. In both cases, the result is the same—a massive increase in the share of the private sector in higher education.

A second reason for the problems afflicting the Indian university system is the rent-seeking behavior that is the inevitable consequence of detailed administrative regulation. The sector is the last refuge of the "license raj" with severe political, administrative, and regulatory interference on virtually every aspect of higher education, be it admissions policies, internal organization, fees and salaries, and the structure of courses and funding.[12] While the private sector has ramped up supply, the quality of most of the new private-sector colleges (many linked to politicians) leaves much to be desired. Their governance problems may be different from public institutions, but are no less acute. As a recent report by a commission appointed by

12. Prior to the onset of economic liberalization in India in 1991, firms were required to seek government approval for what they produced, how much they produced, what technologies they could use, and the sources of financing. Tight quantitative restrictions on imports were enforced through import licenses. The system, whose original logic lay in a planned economy, degenerated into a labyrinth of red tape and rent seeking by state functionaries and businesses, and came to be known as the "license raj."

the Indian government put it, "mushrooming engineering and management colleges, with some notable exceptions, have largely become, mere business entities dispensing very poor quality education."[13]

Ironically, at the same time, the Indian state has made it very difficult for *quality* private universities to come up, jeopardizing the supply of faculty—and the training of future generations.[14] First, the process of regulatory approvals diminishes the capacity of private investment to respond to market needs. Second, the regulatory process produces an adverse selection in the kind of entrepreneurs that invest because the success of a project depends less upon the pedagogic design of the project than the ability to manipulate the regulatory system. Consequently, private investment in higher education is driven principally by profit making goals and not education as a public trust. Consequently, private-sector investment has been confined to professional streams, bypassing the majority of students, and also suffers severe governance weaknesses, raising doubts as to its ability to addresses the huge latent demand for quality higher education in the country. Third, there are significant market failures in acquiring physical assets that are necessary for institutions, especially land. Fourth, regulatory approvals are extremely rigid with regard to infrastructure requirements (irrespective of costs or location) and an insistence on academic conformity to centrally mandated course outlines, degree structures, and admissions policies. Fifth, a key element of a well functioning market—competition—is distorted by not allowing foreign universities to set up campuses in India, limiting benchmarking to global standards. Sixth, the central element of a well-functioning market, informational transparency, is woefully inadequate.

A third reason—and the most important—lies in the key cleavages and drivers of India politics. The contention of a former cabinet minister responsible for higher education, that "inclusion and access with equity are the core issues that confront us today [in higher education]," is noteworthy in that the absence of excellence or the abysmal quality of governance that has made the pursuit of excellence so difficult are simply not deemed as core issues.[15] While higher education is a prime casualty of the populism and fragmentation of the Indian polity, the underlying reason is that it has become a key battleground of distributional conflicts (and not just in India). The main reason is rising skill premia. While this is a global phenomenon—the last two decades have seen a significant increase in the skill premium in both industrialized and developing countries—it is more puzzling in developing countries. Despite numerous problems that afflict the measurement of skill premia, Goldberg and Pavcnik (2007) argue that because virtually all country studies show large skill premium increases, "it is unlikely that they

13. Report of *The Committee to Advise on Renovation and Rejuvenation of Higher Education,* June 2009.

14. The discussion in this paragraph draws from Kapur and Mehta (2008).

15. http://inhome.rediff.com/news/2007/oct/10arjun.htm.

are all a figment of the measurement problems," although the exact magnitudes may be affected by these measurement problems.[16] In India, the skill premium (as measured by the return to a university degree) has increased by 13 percent (relative to primary education) between 1987 and 1999 (Kijima 2006) and 25 percent between 1998 and 2004 (Dutta 2006; OECD 2007).

With identity politics emerging as the principal fulcrum of political competition in India, debates on affirmative action (or "reservations" as it is known in India) as *the* means to increase the representation of socially marginalized groups have been so contentious as to overwhelm virtually every other issue in Indian higher education. While the framers of India's constitution were deeply concerned with the ideals of social justice and equality, these progressive ideas ran contrary to the pervasive and deep-rooted social hierarchy and severe discrimination deeply imbedded in India's caste system. In order to redress centuries of discrimination against India's lowest castes (so-called untouchables, or *Dalits* as they are now known) and indigenous peoples, the Indian constitution enshrined the most comprehensive system of compensatory discrimination for these groups known as "reservations." Seats in federal and state legislatures and jobs in civil services and state-owned enterprises were reserved in proportion to their share in the population. The same was the case in public higher education institutions (except in those run by minorities).[17]

But like the infant-industry argument, affirmative action programs tend to take on a life of their own, as more and more groups press their claims to avail of its benefits. The Indian constitution contains a clause allowing the federal and state governments to make "any special provision for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and Scheduled Tribes" (Constitution of India, Article 15, clause 4). Over time, the expansiveness and ambiguity of the clause "any socially and educationally backward classes of citizens" opened up a Pandora's Box and became a favorite hunting ground for political populism. While affirmative action has had some success (albeit modest) in reducing intergroup inequality, it has tended to amplify intragroup inequalities. Broad social categories like "Scheduled Castes," "Scheduled Tribes," and "Other Backward Castes" tend to gloss over the fact that these are themselves extremely heterogenous categories with hierarchies within them. Consequently, the benefits of reservations are disproportionately garnered by some subgroups—those who were better off to begin with. Moreover,

16. The skill premium increases have been largest in Mexico, where the return to university education (relative to primary education) increased by 68 percent between 1987 and 1993 (Cragg and Epelbaum 1996). In Latin America, a worker with six years of education earns on average 50 percent more than someone who has not attended school, a high school graduate earns 120 percent more, and someone with a university diploma earns on average 200 percent more (World Bank and UNESCO 2000).

17. Article 15 of the Indian Constitution prohibits discrimination, based on religion, race, caste, sex, and place of birth.

while the creation of educated elites from these social groups is indicative of some success, their children benefit much more than the vast majority in the group who, given the limited number of seats, are crowded out. This points to one chronic weakness in these programs—the absence of nondiscretionary sunset clauses that allows the benefits of these policies to spread to other households *within* the group. Finally, perhaps the most inimical impact is that these policies have resulted in a political economy akin to that of rent-seeking. Enormous political energy and effort is spent by politicians promising ever more benefits to more and more social groups rather than improving and expanding the quality of supply by focusing on primary and secondary education. The Indian supreme court has ruled that reservations cannot exceed 50 percent (that would violate equality guaranteed by the constitution), but this has been flouted by several states setting the stage for a possible future constitutional crisis.

Debates on affirmative action are, of course, by no means unique to India. There continues to be widely divergent views on the role of higher education in society. Governments increasingly want universities to be "engines of social justice" on the one hand as well as "handmaidens of industry" or "implementers of the skills agenda" on the other. Alison Richard, Cambridge University's vice-chancellor, has argued that while institutions such as hers "try to reach out to the best students, whatever their background," and "one outcome of that is that we can help to promote social mobility. But promoting social mobility is not our core mission. Our core mission is to provide an outstanding education within a research setting."[18] And even if social mobility is an important goal, how should group rights be balanced against individual rights? Advocates highlight the important "role-model" effect of such programs for disadvantaged groups and the many positive pay offs of diversity, while critics argue that these programs perpetuate racial stereotypes. How valuable is diversity in an educational environment? And what exactly is "diversity"? What criteria (or sunset clauses) should be used to phase out these programs? There is little agreement on even the most basic question. Under what conditions do such programs entrench identity politics or instead gradually erode them? Then there are practical questions of how to implement these programs. To what extent should governments use control or incentive mechanisms to oversee such programs? What should be the policy at private institutions given their growing importance? And how should design of such programs reflect not just the normative aspects but the reality of how political considerations will impact implementation?

In 2006, in an attempt to bolster its electoral base among India's largest social group, the Congress-led United Progressive Alliance (UPA) gov-

18. Jessica Shepard, "Cambridge Mission 'Not Social Mobility,'" *The Guardian,* September 10, 2008, http://www.guardian.co.uk/education/2008/sep/10/accesstouniversity.highereducation/print.

ernment extended reservation benefits to the "Other Backward Castes" (OBCs) in educational institutions run by the federal government. There are ongoing disputes about statistical data used by the government of India and Indian states for offering reservation benefits to these groups, especially because the possibility of entitlements has led to more and more social groups to claim they are more backward than the others.[19] Sundaram (2007) argues that representation of a social group can only be judged by a comparison of its share in enrollments in a given level of education with its share in the population eligible for entry into that level of education rather than the population as a whole. By this criterion, India's OBCs (and, especially, for over 70 percent of them who are above the poverty line), the extent of underrepresentation of the OBCs in enrollments in Indian universities is less than 5 percent. Affirmative action programs that are based on identity rather than income or poverty, for a social group such as India's OBCs whose social and economic conditions reflect the average in the country, risk the better off within the group monopolizing all the privileges, with little benefit to the vast majority in that group.

Another analysis (Basant and Sen 2009) also confirms that the underrepresentation of socially marginalized groups in higher education is much less once the likelihood of completion of high school is taken into account. The likelihood of undertaking higher education increases dramatically for the marginalized groups after they cross the threshold of school education. This increase is particularly the case for women and in rural areas. Table 9.6 lays out the degree of under- or overrepresentation across socioreligious groups. All socioreligious groups except upper caste Hindus and "other minorities" are underrepresented. However, this declines once flow (rather than stock) measures are considered (suggesting improvements over time) and decline significantly when we compare across only the eligible population, that is, those who have completed high school. Take, for example, the OBC group that will now benefit from reservation in higher education. Of the total population in the age group seventeen to twenty-nine, this group has a share of about 34.5 percent; the group's share in the eligible population in this age group is 30.1 percent, while their share in the currently studying population is 28.2 percent.

19. As India's Supreme Court has observed, "The paradox of the system of reservation is that it has engendered a spirit of self-denigration among the people. Nowhere else in the world do castes, classes or communities queue up for the sake of gaining the backward status. Nowhere else in the world is there competition to assert backwardness and to claim 'we are more backward than you.' This is an unhappy and disquieting situation, but it is stark reality. Whatever gloss one may like to put upon it, it is clear from the rival claims in these appeals and writ petitions that the real contest here is between certain members of two premier (population-wise) caste community classes . . . each claiming that the other is not a socially and educationally backward class and each keen to be included in the list of socially and educationally backward classes." Justice O. Chinnappa Reddy in *K.C. Vasanth Kumar v. State of Karnataka* (1985) [Supp. SCC 714, para. 23].

Table 9.6 **Participation in higher education by socioreligious category, 2004–2005**

Socioreligious group	Share in 20+ age group			Share in 22–35 age group			Share in 17–29 age group		
	Total population	Graduates	Eligible population	Total population	Graduates	Eligible population	Total population	Currently studying	Eligible population
H-SC	17.3	6.3	7.9	17.8	7.5	8.9	18.0	10.4	9.9
H-ST	6.9	1.7	2.2	7.2	1.9	2.5	7.1	4.0	2.9
H-OBC	34.9	23.0	27.0	34.8	25.6	29.3	34.5	28.2	30.1
H-UC	23.9	55.4	48.1	22.9	51.7	44.9	22.1	41.8	41.6
M-OBC	4.4	1.7	2.2	4.6	1.7	2.1	5.0	3.2	2.8
M-G	6.8	4.1	4.2	7.2	4.1	4.1	7.8	5.2	4.6
OM	5.8	7.8	8.4	5.5	7.5	8.2	5.5	7.2	8.0
Total	100	100	100	100	100	100	100	100	100

Source: Basant and Sen (2009).

Note: H-SC = Hindu, scheduled caste; H-ST = Hindu, scheduled tribe; H-OBC = Hindu, other backward caste; H-UC = Hindu, upper caste; M-OBC = Muslim, other backward caste; M-G = Muslim, general; OM = other minorities.

If the problem of access is less acute than warranted by recent populist measures, the performance of "reserved" candidates compared to the rest raises further questions on the limits of this strategy. It is not just that reservations at elite educational institutions benefit at best a tiny minority of candidates from socially marginalized groups. The evidence is also strongly suggestive that admission alone will be insufficient to equalize career outcomes even for this tiny minority in the absence of better school-level opportunities. Chakravarty and Somanathan (2008) use data from one of India's most elite institutions (Indian Institute of Management [IIM]-Ahmedabad) and find that that graduates who came through affirmative action (Scheduled Caste [SC] or Scheduled Tribe [ST] or SC/ST) get significantly lower wages (between a fifth and a third) than those admitted in the general category. However, this difference disappears once they account for lower grade point averages of SC/ST candidates, suggesting that the wage differences could be due to the weaker (on average) academic performance of SC/ST candidates.[20] This appears to be the result of poor quality of schooling prior to entering higher education rather than discrimination per se in access to higher education (which in any case in India is almost entirely based on standardized exam scores, such as state wide high school exam results or nationwide standardized entrance tests). Nonetheless, all major actors, be they politicians, courts, media, and even many academics, have focused on access issues in higher education.

9.5 The Evolution of a Surrogate Higher Education System

There is little doubt that the Indian university system is in deep crisis. Given its well documented travails, its limited impact on India's growth needs some explanation. If the traditional university system is doing such a poor job, how have Indian firms addressed their human capital needs in recent years? Sectors such as IT have been growing at a scorching pace. From a few million dollars in the mid-1980s, its revenues crossed 70 billion dollars for FY2008 to 2009. More recently, the life-sciences sector (biotech and pharmaceutical) industry has also been growing rapidly, with revenues of nearly $25 billion in 2007.

Of course it could be argued that a better higher education system would have resulted in even higher growth rates or that the poor quality has imposed economic costs. Large increases in wage premia at the top end of India's talent pool imply that supply of quality talent simply has not kept up with the demand. Other costs may not be visible as yet—they may be more long term or their negative effects may be more social and political rather

20. They also find that (at least in this case) controlling for work experience and grades, there is no wage penalty to being female, and unlike studies from U.S. and British labor markets, there is only weak evidence of any wage premium to being more attractive.

than economic. While I will return to this issue in the conclusion, here it is sufficient to discuss why the travails of Indian universities have not had a more inimical impact on Indian firms. I argue that just as Indian firms have been forced to adapt to chronic weaknesses in infrastructure, labor laws, and so on, they have also adapted to the weaknesses of the Indian university system. A surrogate higher education system has evolved and, in particular, workforce skill development is occurring outside the traditional domestic university model—within firms, by commercial providers, overseas, through open-source or virtual learning, and in narrow specialized institutions, the so-called deemed-to-be universities.

9.5.1 Skill Development by Firms

The private sector has long contributed to higher education through four key mechanisms: directly funding research (indeed, in Japan, doctorates called *ronbun hakase,* were awarded by universities to dissertations that were written by researchers working solely in firms, with appropriate company personnel serving as advisers instead of university professors); private philanthropy supporting gifts and endowments; working with weak public institutions to improve the quality of instructional material and infrastructure; and, most important, through so-called corporate universities—in-house company training and development initiatives. These have been around since the nineteenth century, when large companies such as DuPont and General Electric introduced "corporate classrooms" to provide additional training for employees.

In most market economies, the direct and indirect training costs incurred by the private sector make it the largest provider of professional training. Corporations often have greater access to resources than do public universities and offer training in functional skills and new technologies that may not be otherwise available. Although most of these institutions serve only company employees, some corporate universities are opening their programs to fee-paying students or launching subsidiary for-profit universities.

Recently the new multinational corporations (MNCs) from emerging markets have become innovators in this area, having to compensate for the weakness of the higher education systems in their countries by developing ambitious in-house programs. In principle, there are many benefits when firms organize and pay for the labor market skills they need. Indeed all firms do that to some extent—in most cases relying on some variant of an apprenticeship system. However, developing countries have few large firms that can internalize the costs of these training universities. Moreover, as labor markets become more flexible, the greater turnover of employees reduces the incentives for in-house universities because the benefits of such training are not fully internalized.

Nonetheless, as Wadhwa, Kim De Vitton, and Gereffi (2008) argue, with firms forced to recruit from a subpar pool to fill their skilled labor needs,

Indian industry has addressed this handicap by investing heaving in providing the necessary workplace training and development of their employees. An array of workforce skill development practices including new employee training, continual training, hiring managers from within the company, advanced performance appraisal systems, and investing in education by partnering with universities have all gone a long way in improving the skills of their workforce.

The private sector has also become involved in creating "corporate universities" to try and fill the gap between the skills required for employment and those produced by traditional universities. The most organized effort in this regard has been by the IT industry, whose rapid expansion has led to growing skill shortages.[21] Industry leaders, Infosys, Tata Consultancy Services (TCS), and Wipro, have all set up large campuses and training programs and are also working collectively through the industry body, NASSCOM, to improve pedagogy and training in Indian engineering schools. Infosys has set up a $450 million facility capable of training 18,000 fresh graduates annually at a cost of about $5,000 per student. Each of the candidates recruited by the software company has to spend eight hours a day at a residential company campus studying software programming and attending team-building workshops. In order to graduate, every trainee has to pass two three-hour-long comprehensive exams.[22] Similarly, the Wipro Academy of Software Engineering recruits and trains about 14,000 annually. It screens science graduates and trains them in a four-year program with a well-known private engineering school (Birla Institute of Technology and Science [BITS]-Pilani), at the end of which they graduate with a master's in software engineering and are employed by Wipro. Under a program called TCS Ignite, TCS hires science graduates from over 200 colleges in nine states and then puts them through an intensive seven-month customized curriculum before they are inducted as full-time employees. The condition is that these candidates must agree to stay on with the company for two years.

Collectively, efforts of companies like Infosys's Campus Connect Program and Wipro's Academy of Software Excellence aim to improve the quality of engineers through curriculum development and training in colleges. NASSCOM, the apex body representing the IT industry, has been directing its efforts at standardized skills assessment and verification program and improve the skills of 10,000 faculty members in 1,500 engineering colleges over the next three years.

The surrogate education system is extending well beyond software companies. In finance and banking, accounting firm Ernst & Young, faced with

21. See, "India's Corporations Race to Train Workers and Avoid Being Left in the Dust," India Knowledge@Wharton, September 18, 2008.

22. Infosys's Global Education Centre (GEC) is spread over 335-acres. It has over 500 faculty rooms and 10,300 residential rooms in a built-up space of 6 million square feet and is capable of training 13,000 students in a single sitting.

a severe shortage of freshly qualified chartered accountants for its tax audit business, has opened a tax academy, which trains recruits as tax associates. While India's largest public-sector bank, State Bank of India, annually recruits about 20,000 new employees (from 2.4 million applicants) and has a long-established training program, new private-sector banks are following suit. ICICI Bank recruits undergo a one-year residential classroom training at the ICICI Manipal Academy of Banking and Insurance, a joint venture between the bank and the private Manipal University. The bank and university have jointly designed the course content with courses in treasury, international banking, and microfinance. The costs are paid by ICICI Indian Institute of Banking and Finance (IIBF).

Recently, even a seemingly lower skill sector, the rapidly expanding organized retail sector, has followed suit. Pantaloon (a large retail firm) has started a three-year bachelor of business administration (BBA) program with a focus on retail in association with the Madurai Kamraj University. The Bharti Group has started the Bharti Academy of Retail Academy for Insurance and is also setting up sixty learning centers across the country to offer courses in insurance, telecom, and retail. Other training initiatives in this regard include Reliance Retail, the Future Group and Retailers Association of India.

Industry has also become involved in redesigning curricula. For instance, the Confederation of Indian Industry (CII) has been putting together courses to improve soft skills, training the trainers for this course and to integrate related courses into the university curriculum. This initiative has been launched in the state of Tamil Nadu and will be extended to universities across other states. Firms and industry bodies, with the efforts of state governments are all working at enhancing skill development. The CII is also working closely with the government and large companies in a public-private partnership model to upgrade the government-owned industrial training institutes (ITIs) and align them more closely with the needs of industry.[23] To address the shortage of civil engineers, Volvo Construction Equipment has joined hands with Visveswaraya Technological University (VTU) for offering hands-on industry education to postgraduate students of the university. Under this partnership, the university has recognized Volvo's Resource Centre for Asphalt and Soil Testing Academy as an extension center to offer postgraduate courses in road technology.

Even public-sector organizations such as the Department of Space, the Council for Scientific and Industrial Research (CSIR), and the Defense Research and Development Organization (DRDO) are seeking to address their difficulties in recruiting qualified research and development (R&D) personnel by setting up captive "deemed universities." For instance, the

23. Companies that have adopted ITIs include Bosch; Hero Honda; Ashok Leyland; Larsen & Toubro; and Bharat Heavy Electricals, Ltd.

Department of Space has set up the Indian Institute of Space Science and Technology, and the Department of Atomic Energy the National Institute of Science, Education, and Research. The Bhabha Atomic Energy Research Center (BARC) training schools (established by the founder fathers of India's atomic energy program in 1957), provided the scientific personnel for the Department of Atomic Energy for nearly a half-century. The programs were modeled on the Argonne International School of Nuclear Science and Engineering (1955) and Oak Ridge School of Reactor Technology (1950) in the United States where many of the BARC pioneers had been trained. This is now being transformed into a deemed-to-be university—the Homi Bhabha National Institute (HBNI). Faced with a shortage of trained personnel, the CSIR, a network of thirty-eight government laboratories in applied research, is planning to set up a research university. This would allow the CSIR to impart a quality education and award degrees and thereby create the human capital it desperately needs.

9.5.2 Buying Higher Education Abroad

Higher education and learning has always had a strong international flavor. Where political constraints make any change unfeasible and the supply of higher education institutions with any signaling effect is severely limited, there is an increasing tendency to purchase higher education overseas. Since the late 1990s, the number of students crossing borders to receive education has increased by more than 50 percent. It is estimated that the number of students from developing countries studying abroad is likely to double before 2015 and double again by 2025. While China has emerged as the largest country of origin for international students, there has been a surge of students from India as well.

International student outflows from India have been growing rapidly. In contrast to past decades when these outflows were more the result of low pay offs to skill rather than underinvestment in higher education capacity, with the rapid rise in skill premiums and the difficulties of access to quality institutions within the country, the latter has become more important. Data from the Indian government indicate that more than a quarter million Indian students were studying abroad in 2008 to 2009.[24] In 1993, there were barely 300 Indian students in Australia. In 2008 to 2009, the figure crossed 97,000. However, most of this increase has been either at the undergraduate level and (especially) master's level, not at the doctoral level.[25] Indeed, the number of S&E doctorates received by Indians in the United States peaked

24. Of these, 104,522 were in the United States; 97,035 were in Australia; 25,905 were in the United Kingdom; and 6,040 were in New Zealand. Figures are from a report of the Ministry of Overseas Indian Affairs cited in "Desi Students Are Latest Globe Trotters," *Sunday Times of India,* Bangalore, July 26, 2009, p 7.

25. More than 70 percent of Indian students in the United States were in graduate programs, IIE *Open Doors 2007.*

in the late 1990s (around 1,300 annually) and subsequently declined to about 800 annually between 2001 to 2003.

Until about the mid-1960s, Indians who went abroad for higher education tended to return. And when they did, the reentry vehicle was generally the public sector. From the mid-1960s to the end of the millennium, return rates fell sharply, especially for those with advanced degrees. The pendulum has again begun to swing back, but with one key difference: the reentry of Indians with advanced degrees is now almost entirely to the private sector (especially the growing number of MNC R&D labs), with few joining public-sector research institutions. In the latter case, many researchers have postdoctoral experience abroad, rather than doctoral degrees (this is especially true of the biological sciences).

While there are many gains from these outflows, there are two significant costs. One, a large number of students, especially those engaged in research, do not return. Despite the increasing attractiveness of India, the percentage of Indians obtaining PhDs in S&E who had "definite plans to stay" in the United States increased from 56.3 percent in 1994 to 1997 to 62.7 percent in 2002 to 2005, even as the number of Indians obtaining PhDs in S&E declined by 30 percent (from 5,014 to 3,587). And two, students (and parents) incur very large expenditures, which are almost the same as the total higher education expenditures in the country—for a tiny fraction of the number of students in the country. While public higher education spending in India was about $4.5 billion in 2006 to 2007, Indians were spending nearly $3.5 billion buying higher education overseas (Kapur and Mehta 2008).

Although the number of students from developing countries seeking education abroad has sharply increased in recent years, the phenomenon itself is not new. What is newer, however, is the reverse: foreign higher education institutions, establishing programs in developing countries under a variety of arrangements ranging from cross-border franchised agreements, twinning agreements, joint programs, validation programs, subcontracting, and distance learning activities.[26] For example, the growing demand for nurses in India (and abroad) has led to a burgeoning number of private nursing schools. Although these are accredited by the Indian Council of Nursing, this carries little signaling value. Recently, a group of private nursing schools in India approached the Commission on Graduates of Foreign Nursing Schools (CGFNS), a statutory U.S. body, to create a set of standards that could become an imprimatur and have a distinct signaling value.[27] The importance of external validation mechanisms is likely to increase.

26. Under twinning arrangements, after initial training in their home country, students relocate overseas to receive their final training and degree from the foreign university. Under franchising programs, the entire program takes place in the home country, with the foreign institution providing curricula and assessment and certifying the program with the university crest on the degree.

27. Interview with Barbara Nichols, CEO, CGFNS, Cambridge, September 27, 2008.

The other alternative, attracting foreign higher education providers to India, has faced strong resistance. There is no dearth of critics who fear the entry effects of foreign providers of higher education. Some fear that foreign providers—by importing curricula with little consideration of local traditions and culture—might prove to be Trojan horses of cultural imperialism. Others argue that foreign providers arguably undermine the sovereignty of the state, especially in its capacity to regulate education and its nation-building functions. A third concern is that because transnational education is aimed primarily at upper socioeconomic groups, foreign providers may simply engage in "cream-skimming," exacerbating inequities in access to tertiary education. A fourth concern is of an internal "brain-drain"—wage differentials between faculty at public and private (foreign) institutions would result in public universities stripped of their most talented teachers.

These concerns must be juxtaposed against a reasonable counterfactual. It is not as if the current "closed" system higher education system has either sharply reduced social inequality or brought about exemplary "nation-building." If the choice is between students going overseas and spending money there or spending it mainly at home, the latter is surely a less-worse option. Indeed, a policy of allowing any university ranked in the world's top 1,000 could only improve Indian higher education given the handful of Indian universities that make the grade, as noted earlier.

But India's political economy has made liberalization in this sector exceedingly difficult. However, the return of the Congress party led government in 2009 with a stronger mandate, and the weakening of the left parties led to renewed hopes that a policy change would occur. Such a change would require the government to pass a bill in parliament that could only occur if it ensured a level playing field between foreign and domestic suppliers with regard to the sensitive issue of social obligations, namely affirmative action. This would make it very unlikely that reputed foreign universities would enter India, at least at the undergraduate level. The few that might will confine their activities to graduate, specialized degrees.

9.5.3 Virtual Education

Technology is driving another mechanism of availing of higher education—virtual education. Distance learning is not a new phenomenon in developing countries—students have enrolled in correspondence courses for decades, especially in teacher training programs.[28] But these classes had little interaction between faculty and students and were plagued by high dropout rates. However, significant improvements in technology in the past

28. In 1996, all of the five largest distance-learning programs were based in lower- or middle-income countries (World Bank and UNESCO 2000). These include Anadolu University in Turkey, founded in 1982; China TV University, founded in 1979; Universitas Terbuka, Indonesia, founded in 1984; Indira Gandhi National Open University (IGNOU), India, founded in 1985; Sukhothai Thammathirat Open University, Thailand, founded in 1978.

decade have transformed these programs, drastically increasing their size and scope. Despite skepticism on numerous fronts, especially perceived weaknesses on key components of quality education—discussion, collaboration, and reasoning skills—virtual education has been increasing rapidly. There has been a dramatic expansion of resources available online, specifically through the use of "open courseware," in which high quality "open knowledge" materials, including course content, library collections, and research data is being made available online. In 2006, more than 100 higher education institutions and associated organizations from around the world launched the Open Courseware Consortium, each pledging to place course materials for at least ten courses online for free.[29] By reducing constraints on access to quality content and instruction at low cost, virtual education has much promise. Nonetheless, making these resources available online does not solve the problem of access for the less privileged without addressing the availability of affordable Internet access, which continues to be a critical impediment.

The principal driver of virtual education in India has been the Indira Gandhi National Open University (with more than 1.8 million students). Despite the brouhaha about India's IT prowess, until recently there were only limited attempts at leveraging its potential for virtual education. However, a recent joint venture funded by the Indian government that includes all Indian institutes of technology (IITs) and the Indian Institute of Science (IISc), called the National Programme on Technology Enhanced Learning (NPTEL), aims to enhance the quality of engineering education in the country by developing curriculum-based video and Web courses. Dissemination is through an agreement with Google and YouTube. The NPTEL YouTube channel covering the courses hosts about seventy-four courses currently and has had more than 1.3 million visitors. However, the didactic importance of this mechanism is unclear as yet.

A major handicap is that 80 percent of India's Internet connections are in the country's twelve largest cities (which account for about one-tenth of the population). To address this issue, the Indian government launched a new $1 billion initiative in 2009—National Mission in Education through Information and Communication Technology—to provide content generation, connectivity, and computing infrastructure to all higher educational institutions across the country.

9.6 Conclusion

The paper has argued that while there has been a substantial growth in higher education in India, whether measured by the number of students or

29. Other examples include Connexions, the Open University in the United Kingdom, and CMU's Open Learning Initiative. They offer some advantages in that they are specifically designed for online distance learning.

expenditures (especially private), serious governance issues have hobbled the Indian university system. To the extent the Indian system has succeeded, it is largely the result of Darwinian selection mechanisms. The formal labor market invariably selects from such an enormous pool, with selection ratios often less than 1 percent, with the assumption that those selected may have limited skills but have the attributes to be trainable. A parallel surrogate higher education system has, however, evolved to impart job-related skills that are more akin to vocational education rather than a conventional university system.

In June 2009, a committee set up by the Indian government a year earlier submitted its report.[30] The report was a severe indictment of the Indian higher education system and largely corroborates many of the weaknesses emphasized in this paper. It called for sweeping changes to the regulatory system, abolishing the plethora of regulatory bodies and replacing them by a single body: a Commission for Higher Education and Research (CHER). In order to shield the new regulator against political pressures, the report emphasized that this commission be established through a constitutional amendment and have a constitutional status. It also highlighted the dangers of the growth of specialized institutions of higher education in the country at the cost of broad-based universities, short-changing the possibilities of a broad-based undergraduate education and cross-fertilization of ideas across disciplines. At the time of writing this paper, however, it was unclear if the Indian government would adopt the roadmap for reforms suggested by this commission or put into place some other ideas.

In addition, this paper also raises fundamental questions about just what we mean about higher education and the purposes it serves. Beyond selection, it is unclear what is the value added by higher education in India. It is entirely possible that the limited numbers of good higher education institutions benefit the few who have access to them and crowd out from labor markets others with similar ability but who lack access. Furthermore, with formal educational qualifications becoming more prevalent, the pressures to get credentialed are mounting, without the corresponding skills and training. However, just as an arms race does not lead to greater security despite much greater spending, the upward spiral in education credentialing in India, as elsewhere, may not yield social benefits commensurate to the expenditure (e.g., Wolf 2004; Murray 2008).

The success of the evolving surrogate education system has (at least now) depended mainly on drastic selection mechanisms and the ability to pay private providers. But for the vast majority of graduates with worthless degrees, who are not selected into these training programs and left to the

30. Government of India, *Report of the Committee to Advise on Renovation and Rejuvenation of Higher Education,* June 2009. The report is also known as the Yash Pal Committee report after the Chairman of the Committee that drafted the report.

vagaries of the informal sector, the risk of being locked into low productivity occupations is very real. The rapid increase in the number of credentialed but poorly educated young people posed significant political challenges for India in the 1970s at a time of economic stagnation. In an era of rapid growth these dangers are less apparent—but the sharp increase in their numbers and expectations, coupled with weak formal job market prospects for the majority of India's graduates, may well come back to haunt the country if its growth falters.

Even otherwise success in labor markets does not imply success in knowledge creation. India's knowledge needs in areas with large public goods pay offs, in social sciences and a host of basic sciences, be it climate change, health economics, infectious diseases, or agricultural technologies, have been woefully neglected. The Achilles heel of the system is that higher education in India has become so completely focused on professional education that the less instrumental aspects of higher education—research and training in the "liberal arts" and "pure" sciences—have atrophied significantly.[31] It is hard to gauge the long-term effects of this decline because there is little agreement on even the most fundamental question about higher education: what is the purpose of higher education? To train people for a labor force or train a labor force that is, in turn, trainable by employers? To create a middle class? Be an engine of innovation? Provide a ladder for social mobility or create national elites? To influence and mold the minds of young people? If the answer is "all of the above" (however weakly), the prognosis may be less bright than currently thought.

Given the enormous pool of young people in India, the future of India's higher education system will have considerable effects on the U.S. higher education system given that students from India constitute the largest number of foreign students in the United States. In the foreseeable future, at least that demand will remain, given the growing cohort of India students and the weaknesses of the Indian higher education system. However, the more noticeable change is likely to come when India modifies its policies to attract foreign universities and a new generation of Indian higher education institutions gets established. During the 1950s and 1960s, the collaboration between U.S. and Indian institutions established some of India's leading higher education institutions (see box 9.1). While those arrangements will not be precisely replicated, there are likely to be growing linkages between the large number of new central government as well as private institutions that are being set up and U.S.-based institutions on faculty training and exchanges, pedagogy, collaborative research programs, and student

31. For a view on India's attempts at improving science education, see Shobo Bhattacharya, "India's Education Experiment in Basic Sciences: The IISER Solution," *India in Transition,* January 7, 2009, http://casi.ssc.upenn.edu/iit/Bhattacharya.

Box 9.1 Examples of successful United States-India collaborations in higher education

Successful collaborations between the United States and India have a left a strong legacy, not just for India but for the United States as well. The Indian Institute of Technology, Kanpur, established in 1959, benefited in its first decade from the Kanpur Indo-American Programme, where a consortium of nine U.S. universities (Massachusetts Institute of Technology [MIT]; University of California, Berkeley; California Institute of Technology; Princeton University; Carnegie Institute of Technology; University of Michigan; Ohio State University; Case Institute of Technology; and Purdue University) helped set up the research laboratories and academic programs. The Indian Institute of Management, Ahmedabad established in 1961, collaborated with Kellogg School, Wharton School, and Harvard Business School in its initial years, while Indian Institute of Management, Calcutta, was developed in collaboration with MIT's Sloan School of Management and the Ford Foundation. Faculty training and program design were the key elements in these collaborations.

A less heralded, but equally successful collaboration, was the U.S. role in developing Indian agriculture higher education institutions. During the 1960s and 1970s, the Ford Foundation financed a large-scale extension build up, the Rockefeller Foundation helped strengthen agricultural research, and the United States Agency for International Development (USAID) helped conceptualize and finance a new institutional innovation—state agricultural universities. Because of the lack of knowledge about U.S. institutions, the Rockefeller Foundation awarded ninety short-term travel grants to Indian scientists and teachers to visit agricultural colleges and experiment stations in the United States between 1959 and the early 1970s, while resisting pressures to invest in university buildings and equipment.

In the 1950s, an Indian delegation visited the United States. Impressed by the contribution of the land grant universities, it recommended the establishment of at least one state agricultural university (SAU) per state. In 1960, India decided to create SAUs that were directly responsible to the states and outside the control of the Ministry of Education. The USAID provided funding for five American universities to enter into partnerships with nine of the newly established SAUs. The five American universities supplied 300 professors on assignments of two or more years to these nine Indian universities. An Agricultural Universities Commission was established in 1960. The Indian government invited the Rockefeller Foundation to help to

help to craft a system of core institutions to support the development and spread of the Green Revolution and the Ford Foundation to help the Indian Council of Agricultural Research build centers of excellence to serve all of India at some of the state universities during the 1960s.

Today, the Gates Foundation is poised to play a similar role by assisting in the establishment of new public health schools in India to address India's poor record in this area. These collaborations have not only served India well through a cadre of excellent engineering and managerial human capital, and the technological basis for India's agricultural growth, but also helped supply the United States with excellent talent who over time created strong bridges between the two countries.

exchanges. In addition, programmatic research in global goods, such as sustainable agriculture, climate change, energy, transport, tropical diseases, and water, are likely to grow as well. India will represent one of the biggest overseas opportunities for U.S. higher education well into the future.

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