

IT Offshoring and India: Some Implications

著者	Balatchandirane G.
権利	Copyrights 日本貿易振興機構（ジェトロ）アジア 経済研究所 / Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO) http://www.ide.go.jp
journal or publication title	IDE Discussion Paper
volume	86
year	2007-01-01
URL	http://hdl.handle.net/2344/422

Discussion Papers are preliminary materials circulated to stimulate discussions and critical comments

DISCUSSION PAPER No.86

**IT Offshoring and India:
Some Implications**

G. Balatchandirane

January 2007

Abstract

There has been a large spurt in the offshore outsourcing of Information Technology (IT) recently. India has been a major recipient of such work. There have been loud protests against the “loss” of jobs in the US as work was shifted to India. The large inflow of IT related work has also had major impact on the Indian economy. There are implications on the foreign policy level as well. While the economic implications are well known, we try to see a little of the foreign policy implications in this paper.

Keywords: Offshoring, information technology, foreign policy

JEL classification:L86, O53

* Visiting Research Fellow, IDE. email: balagvnd@yahoo.com

The Institute of Developing Economies (IDE) is a semigovernmental, nonpartisan, nonprofit research institute, founded in 1958. The Institute merged with the Japan External Trade Organization (JETRO) on July 1, 1998. The Institute conducts basic and comprehensive studies on economic and related affairs in all developing countries and regions, including Asia, the Middle East, Africa, Latin America, Oceania, and Eastern Europe.

The views expressed in this publication are those of the author(s). Publication does not imply endorsement by the Institute of Developing Economies of any of the views expressed within.

INSTITUTE OF DEVELOPING ECONOMIES (IDE), JETRO
3-2-2, WAKABA, MIHAMA-KU, CHIBA-SHI
CHIBA 261-8545, JAPAN

©2007 by Institute of Developing Economies, JETRO

IT Offshoring and India:

Some Implications

- G. BALATCHANDIRANE

While producing a commodity or delivering a service, a firm might get part of the commodity or service produced from another firm and this is called as outsourcing. When the latter firm is abroad or “offshore” it is called as offshore outsourcing, or simply as “offshoring”.¹ Offshore outsourcing has been in vogue for quite some time in manufacturing. It is of late that this term has acquired high visibility after there was a large scale migration of IT related jobs and services across borders. The countries that sent the work offshore, it is held, lose jobs to those who receive the offshored work.²

The global data processing and outsourced market had a value of \$246 billion in 2004 with North America accounting for 43.6 percent, Europe 29.4 percent, Asia-Pacific for 17.8 percent, and the rest of the world 9.1 percent.³ The United States is the country that started the offshoring trend in IT and today accounts for the largest share of offshore work sent out by any country in the world. The United Kingdom, Germany, France, and other Western European countries come next. India is major recipient of this offshored IT work. A recent development in offshoring is that Indian companies that receive offshored work

¹ Offshore outsourcing conjures visions of a sea being crossed. The US is said to offshore outsource IT services from India. A number of European countries that outsource from other European countries that can be reached by crossing the land border do not use this term. Some MNCs headquartered at a developed country start a subsidiary or buy a firm in a developing country to exploit the human capital and wage differentials they thus have access to and utilize this to produce part of the good or service they sell. This would be called as captive outsourcing. I use the terms “offshore outsourcing” and “offshoring” interchangeably.

² Much has been written on the alleged loss of jobs especially in the US due to offshoring of work. What probably is relevant is the net gain to the economy that sends jobs abroad. For some of the better write-ups on this debate, see The Economist 2004, and Aspray, William, Frank Mayadas, Moshe Y. Vardi, eds., 2006

³ Datamonitor data, as cited by Aspray, William, etal “Offshoring: The Big Picture” in Aspray, William , Frank Mayadas, Moshe Y. Vardi, eds., 2006.

have begun to open facilities in China, where wage rates are lower than in India and a huge local market is emerging. They are in net effect offshoring work offshored to them to capture the economic benefits of even lower wages in China. An assessment by the consulting firm A.T. Kearney of the most desirable future locations for offshore work placed India at the top of the list, followed by China, Malaysia, the Czech Republic, and Singapore.⁴ Table No. 1 gives the statistics related to the worldwide offshore market in IT.

Reasons for the rise of offshore outsourcing

Software was the first service sector that was offshore outsourced in great amounts. The basic reason for this was the tremendous ease with which the work data and work products could be transported. It did not require very sophisticated communications equipment either. In the 1980s the price of telecommunications equipment fell drastically. This was to change the notion that the developing nations could handle only low-end work in software related work. Data that used to be encoded on physical media could now be sent through the wire. The process was facilitated by the cheap as well as easily available telecommunications bandwidth. Offshore outsourcing which began as a trickle, rapidly increased in volume. Even sophisticated high value added software creation could be outsourced from developing countries like India. What was till recently unthinkable as being suited for production in India was being outsourced from it as India scored over the developed world in terms of cost. There seemed nothing that was the exclusive turf of the advanced world in the field of IT. Nandan Nilekani, CEO of Infosys hit the nail on the head when he declared “Whatever can be sent down a wire is up for grabs”.

The second major reason would be the fact that the fall in transport costs had led to a separation of geography of production and consumption for manufactured productions under the process of globalization in the last decade or so; now it is impacting on Software and IT related services in a similar way. These services which will be generated in countries like India “will be consumed at the other end of a fibre-optic cable in America, Japan and Europe”. A study by

⁴ A.T. Kearney 2004 as quoted in the World Investment Report 2004. See *Ibid.*

McKinsey found that the supply of IT services is the most global. Already 16 percent of all the work done by the world's IT-services industry is done remotely, away from the places where they are consumed. Potentially, as much as half of this entire work can be moved away, or can be outsourced.⁵

The third major reason would be the growing complexity of white-collar work in the developed world. Outsourcing helps divide the increasingly complex job into more manageable piece works. Companies started outsourcing the work of their IT departments, development of business software as well as managing corporate computer networks. It is believed that up to half the world's biggest companies have outsourced some IT work.

Among the other major reasons is the access to skills that countries like the US can have by outsourcing. While the US undoubtedly has a huge educational apparatus producing vast quantities of human capital, this does not suffice. With countries like India joining the world market, and with the existence of an excess of educated workers at a time when the US math and science educational system is slowing down its production, new opportunities for moving work offshore have come about. Thus another reason for companies to send work offshore is the size and quality of the available labor pool abroad. In the late 1990s, many US firms turned to Indian vendors because they had available programmers with the knowledge of legacy systems to make Y2K fixes. Similarly, during the dot.com boom in 1999 and 2000, many US firms turned to offshore vendors to find enough people who knew the Java programming language. There was an abundance of such people in India, for example, not only because of the large labor pool but also because of the private players in the computer education system in India reacted quickly to the market and taught skills that were in current demand.

Yet another reason is the fact that outsourcing gives market access. Companies sometimes find it strategically attractive to have a market presence in countries in which they would like to sell their products. The next reason would be that outsourcing helps IT firms that face the "feast or famine" situations, that is,

⁵ The Economist 2004.

during any given period of time, either they do not have enough work or they have too much work. These small companies cannot afford to keep a very large workforce on their payrolls because they cannot afford the payroll in lean times, and therefore they have to work with a minimum workforce. However, this causes problems for the company when it lands a large project that needs to be completed in a short period of time. The rational way out is to outsource work.⁶ Finally, as more and more companies in the US outsourced their work, this had a cascading effect. Companies willy-nilly had to go in for outsourcing as their competitors were doing it and reaping economic gains.

Why India was an attractive offshoring destination

One important factor was the substantial wage differential that existed between major consumers of software services (like the US) and India which for a variety of reasons had a comparative advantage in providing software related services. While it costs \$45,000 annually in the United States for a new software engineer to be employed and only \$5,000 per year in India in the mid 1990s, and despite the many additional overhead costs associated with offshoring, firms made substantial cost-cutting by sending work to the India.

The second factor was the plentiful availability of human resources (both with and without engineering degrees) in India with capabilities in the English language - the language of global business and law. Around 290,000 engineering degree and diploma holders enter the workforce annually in India. A large share of them enter the IT industry. Most have received their education in English. Table No. 2 gives an idea about the pool of graduates in India.

The number of IT and ITES professionals employed in India has grown from 284,000 in 1999-2000 to an estimated 813,500 in 2003-04. Most of the new recruits are recent graduates with various academic backgrounds. Turning to the worker demand and supply for the IT sector, NASSCOM estimates that the supply of IT professionals will in fact outstrip demand by 48,000 in 2008. The

⁶ Aspray, William, etal "Offshoring: The Big Picture" in Aspray, William , Frank Mayadas, Moshe Y. Vardi, eds., 2006.

number of professionals who would be joining the IT workforce from various academic disciplines is given in the Table No. 3.

Among other minor factors would be the time difference between India and the West, primarily the US - the largest market for IT and IT related services. While this factor initially spurred medical transcription, now some of the US companies exploit this to work on a software round the clock. The US company would work during day time on a particular software creation or application and then pass it on to the Indian counterparts for whom the day begins when it ends in the US. They in turn work till evening when it becomes day in the US and pass it back.

The offshoring of software services began in India with “body-shopping”, namely, the dispatch of computer professionals by an Indian company to work in a country like US at the client’s premises for a fixed period of time. Later the trend of doing part of the work at the client’s site and the rest in India followed. This was followed by call centres, then IT enabled services like accounting and the like. From medical transcription, Indian companies moved to IT-enabled knowledge processing namely there was a shift from Business Process Outsourcing to Knowledge Process Outsourcing (BPO to KPO). Examples would be the reading of X-rays, patent analyses, and doing IT research and development. Foreign MNCs started opening BPOs initially and later R and D centres to exploit the low cost of human capital. The low cost of human capital which was important earlier and still matters today is not so much of an overriding concern of the companies that outsource from India now. The quality of R and D work that can be done in India is given a high rating today.

Where does India stand today?

A brief review of the growth of IT and ITES (IT enabled services) in India might be in order.⁷ For 2004-05, the IT-ITES production in India was US\$ 28.2 billion. Of this IT Services and Software accounted for 59 percent, hardware 21 percent and ITES and BPO 20 percent. IT-ITES exports for 2004-05 was

⁷ The following figures are from the NASSCOM (2005).

US\$ 17.9 billion. Of this IT Services and software was 68 percent, hardware 4 percent and ITES and BPO was 28 percent. The US accounts for 68 percent of all of India's IT and ITES exports. Japan takes up just 3 percent of the total and South Korea is 0.2 percent and China is a measly 0.1 percent. The Indian domestic market for IT and ITES was US\$ 10.2 billion in 2004-05. Of this hardware was 52 percent, software 5 percent, IT Services 38 percent and ITES and BPO 6 percent. The global IT and ITES production for Calendar Year 2004 was US\$ 1410 billion. Of this North America held a share of 50 percent. India accounts for just 2 percent. India's exports to North America was US\$ 10 billion. In the global total of US\$ 1410 billion software is 14 percent, hardware is 25 percent, IT Services, ITES and BPO is 60 percent.

There are a little over 3000 software firms in India. The industry is heavily concentrated with the top 20 players accounting for 48 percent of the total IT services and software revenue and nearly 63 percent of the total IT services and SW exports in FY 2003-04. The top three companies have sales turnover in excess of US\$ 1 billion. In ITES-BPO attrition levels are in the range 25-40 percent. For 2004-05, ITES-BPO were US\$ 5.7 billion. 90 percent of this figure were exports. The US accounts for two thirds of total exports and UK 29 percent. With about 400 players here the top 20 account for half the industry aggregate. About 850,000 strong workforce is employed in the IT and ITES industry. Total number of IT and ITES-BPO professionals employed in India has grown from 284,000 to over 1 million in 2004-05.

As against the above figures, The NASSCOM *Strategic Review 2006* predicted that the Indian IT-ITES Sector will exceed US\$ 36 billion in the FY 2006.

⁸ It pointed out the following:

- IT-ITES sector estimated to grow by 28 percent, to account for 4.8 percent of GDP in FY 2006
- Employment in software and services sector to touch 1,287,000

⁸ Summary version accessed at http://www.nasscom.org/artdisplay.asp?Art_id=4989

- Software and service exports to grow by 32 percent, to reach US\$ 23.4 billion

Table No. 4 gives the relevant figures for the period 2004-06. Among the key highlights of the NASSCOM Strategic Review 2006 were the following:

Steady growth: The Indian IT-ITES expected to exceed US\$ 36 billion in annual revenue in FY06, an increase of nearly 28 percent in this current fiscal

- Exports to account for nearly two-thirds of the total revenues IT-ITES sector to contribute to 4.8 percent of GDP in FY06
- Engineering and R&D, software products hold significant opportunity for India - growing at 37 percent and 43 percent (CAGR FY 2003-06E), respectively
- Indian IT-ITES sector on track to achieve the targeted US\$ 60 billion in exports by FY 2010
- **Emergence of newer locations:** As global delivery matures, newer locations are emerging; however India remains the undisputed leader
 - India maintains its distinctive lead amongst offshore destinations
 - Strong fundamentals help sustain India's value proposition
 - Has 28 percent of the suitable talent available across all offshore locations (outranks the next destination by a factor of 2.5)
 - Keen emphasis on security and quality
 - Sustained cost competitiveness, gains from increased productivity, utilization and scale expansion

Let us now consider the importance of India to the rest of the world and vice versa and the growth prospects for this sector globally and for India in the near term. There is a vast amount of literature on what IT can do for a country like India.⁹ Here we are concerned only with the economic impact of offshoring on India. Offshore outsourcing is probably the one growth area that has been

⁹ See among others Adeya, 2002; Tessler, Shirley, Avron Barr and Nagy Hanna, 2003; Arora, & Athreye, 2002; Bhatnagar & Schware, eds., 2000; Chandrasekhar, 2003; Kapur, 2002; and Kumar, 2001.

registering growth rates in the region of 30 percent every year in the last decade in India. It has been directly boosting India's exports and has come to occupy a growing share of total exports. It has literally led to the creation of hundreds of thousands of new jobs. IT is seen as the way for India to leap from being a third-world economy in the 20th century to a world leader in the 21st century.

Concomitant with these trends the foreign software companies in India have been on a recruitment overdrive. Table No. 6 which gives an idea of the number of personnel that some of the better known names in the industry have recruited in India and compares it with their total number of global employees. By any standard the percentages are impressive and show the importance of India as a outsourcing hub for these companies. It is noteworthy that these companies are involved in design and high end development in their India operations, indicating the climb up the value chain for India.

Software services have become India's largest export, and the emergence of India as a source of software service exports is attracting great attention in the developing world. The question being raised is whether the Indian way of development through IT outsourcing can be a way to leapfrog and join the ranks of the advanced west. It is held that there is much that other developing nations can learn from India. In this regard.¹⁰ Employment reached 697,000 (approximately 50 percent working for the domestic market) at the end of March 2005 a growth of 19.8 percent from the year earlier (Nasscom 2005). If the industry grows at 20 percent per year in 2005-2006, then the number of employees added in India would be the equivalent of all the software workers in Ireland and Israel combined. India is emerging as the single most important destination of software services offshoring.

The Size and Impact of Offshoring in India

¹⁰ See for instance Tojo Thatchenkery, Roger R. Stough, Govindasamy Balatchandirane and Rupa Ranganathan, 2005 and Tschang, 2001

According to IDC, global demand for IT services and BPO was estimated at US\$ 847 billion in 2004 and is expected to reach US\$ 1,082 billion by 2007. Over the same period, the 'offshore-able' market is estimated to increase from US\$ 634 billion to US\$ 836 billion. NASSCOM estimates suggest that offshore penetration is likely to increase from an estimated 6.3 percent of the global IT services and BPO market in 2004 to 8.8 percent by 2007. The value of global services delivered from offshore locations is forecast to rise from US\$ 39.6 billion in 2004 to nearly US\$ 74 billion by 2007.¹¹ The software and service industry is becoming increasingly important to India's economy, growing from 3 percent to 21 percent of India's total exports between 1996 and 2003.¹²

According to the NASSCOM Strategic Review 2005, the Indian IT sector "... has risen to become biggest employment generator with the number of jobs added almost doubling each year, has spawned a number of ancillary businesses such as transportation, real estate and catering, and has contributed to a rising class of young consumers with high disposable incomes. Indian IT-ITES growth has had a significant multiplier effect on the Indian economy. Apart from the direct impact on national income and employment, the sector has also contributed to the growth of several ancillary industries, a rise in direct-tax collection and an increase in consumer spending due to the significantly higher disposable incomes. Arguably, the most significant impact of the growth in IT-ITES is the increase in employment generation effected by the industry. Indian IT-ITES currently employs over 850,000 people in the Indian IT-ITES industry. Currently, engineers and other graduates account for 72 percent of the workforce. The cumulative demand for professionally qualified employees (MCAs, CAs and MBAs) is rising, expected to exceed 280,000 in the current fiscal. In addition to the 850,000 strong workforce employed directly in the industry, Indian IT-ITES will have also created approximately 1,150,000 indirect employment opportunities in tertiary industries such as transport, catering, construction industries, security and housekeeping services, etc."

¹¹ NASSCOM Strategic Survey of Indian IT Industry 2005.

¹² Arora, Ashish et al "The Economics of Offshoring" in Aspray, William , Frank Mayadas, Moshe Y. Vardi, Eds. 2006

According to NASSCOM estimates, the total value of tax deducted at source (TDS) by the IT-ITES industry in FY 2003-04 amounted to US\$ 226 million (over 10 billion Indian Rupees). Of this taxes deducted on salaries paid alone accounted for over US\$ 173 million (nearly 8 billion Indian Rupees). This gives an idea of the the sudden increase in disposable income in the hands of a relatively young and unattached section of the society. This is also contributing to the rapid growth in consumer demand. It is estimated that in FY 2004-05, the Indian IT-ITES sector will have contributed to creating the demand for nearly 12,500 passenger cars, over 80,000 two-wheelers and over 150,000 mobile phone subscriptions. The rapid growth of IT-ITES in India has led to a surge in demand for real estate and construction. It is estimated that the IT-ITES industry currently accounts for approximately 6-7 percent of the incremental demand in this segment. Indian IT-ITES currently accounts for an estimated 26 percent of hotel room occupancy in the metro cities and over 18 percent of all airline seat capacity - higher than any other single sector of the economy.

The maturity of offshore outsourcing in India is contributing to the reversal of the brain-drain witnessed in the 1980s, when a number of Indian's migrated to western economies in search of better career opportunities. The reverse trend has come to the fore with MNCs choosing to send their own senior executives - often foreign citizens of Indian origin - to establish and run their operations in India. With the rise of India as the preferred offshore destination, companies are now also moving young expatriate recruits on Indian salaries to work here for short periods. This allows the Indian companies to gain access to multi-lingual capabilities essential to serve the newer, non-English speaking markets. In turn, the expatriate candidates earn the experience of working in a global business environment and a working holiday in India. Overall, the trend towards offshoring of IT Services is bound to increase in the future and India would be a large player in the offshoring business. Though there is competition, India's pre eminent position would continue for the near future.¹³

Foreign Policy Issues

¹³ See for instance Aggarwal, Alok and Abhishek Pandey, 2004.

The rapid rise of the Indian IT Industry (and offshoring in particular) has long term and deep economic impact on the Indian society. This also ultimately affects foreign policy considerations. The following would be some of the issues that will have some foreign policy relevance when we consider the rise of India as an increasingly important destination for the outsourcing of software services.

Firstly, the economic weight of India inside Asia will rise¹⁴ and it will be an increasingly important player in software outsourcing sector. It will also move up the value chain. There are competitors like China, Philippines etc in outsourcing, but India's lead time which is estimated to be 5-10 years will be a major advantage. It has to be also remembered that the highest concentration of the highest level of certification for software companies in the world is in India implying the high quality level of these companies. Further most of the major western Software producers have opened large R and D centres in India clearly indicating the Indian climb up the value chain. The IT sector in general (and outsourcing in particular) would be major drivers of the economic rise of India inside Asia. The increased economic weight would lead to more "voice" for India in Asia and elsewhere. The visibility of India which has gone up in the international arena recently will go up further. How India exploits these positive attributes to achieve its foreign policy goals is a moot question.

Second, the sharp chorus against outsourcing that took place in the US in 2004 and which took political overtones, died down and has been replaced by a number of sober write-ups. While no new flare-up is foreseen for the immediate future, as the job losses in the US are still substantial, India will need to be diplomatically prepared to negotiate any revival of the problem.

Third, the projected growth rates in the IT sector and outsourcing itself indicate that there is going to be a huge shortfall in the human capital that will be required. The entry of foreign universities, will stir up a number of controversies. The developed world is interested in the export of universities in India as they

¹⁴ See for instance Wilson, Dominic and Roopa Purushothaman, 2003. In what came to be called as the BRICs report they predicted that India would have a growth rate of over 5 percent till at least 2050, the highest for any country in the world. The net result would be that Indian economy would overtake Germany around 2022 and Japan around 2032. Though the report did not specifically mention the IT industry's spectacular growth, this was factored into the overall matrix.

face a resource crunch. Western governments are also in favour of their universities setting up shop in India. India will have to take into account the increasing privatization as well as quality issues in higher education. This implies India will have to play a proactive role in General Agreement on Trade in Services (GATS) under the auspices of WTO to ensure that the attempts to introduce educational services in the realm of free trade are not detrimental to it. How far the “public good” nature of higher education will be maintained by the private providers of education is a worrisome aspect.

Fourth, one important reason for the success of the software industry and outsourcing in India is that the network of Indian IT professionals in the Silicon valley kept their contacts with their counterparts back home. A sizeable number of them have come back. How well the Indian government uses these networks to preempt any unfavorable legislation and how well this mobile pool of labor is utilized for the seeping of technology inside India is another aspect that merits consideration.

Fifth, the Indian government and private sector have just begun to understand the importance of lobbying in the US. Well over a million US\$ has been spent in the recent efforts to convince the Senate to pass the nuclear agreement. Having learnt the efficacy of lobbying, how the government and private sector utilize it to ensure non passage of legislation detrimental to outsourcing as well as to raise the limits on H1B visas would be a relevant issue.

Conclusion

While India certainly will gain in the near term, it is no cake walk either. It is worth remembering that India accounts for a tiny share (about 2 percent) of the global software market and is still so visible and the impact in both economic terms and foreign policy terms so large. With this share slated to rise, the impact is going to be much larger and hence the earlier problems are going to enlarge or newer ones are going to emerge. How well India tackles the foreign policy issues related to offshoring will be important. This is the second chance that India is getting to use the rapid rise of IT industry as a driver to economic development. India has lost the first round which belonged to manufacturing. How well it does

in protecting its interests in the second round will determine whether India manages not to miss the bus or end up as an also-ran.

Author's E mail id: balagvnd@yahoo.com

References

Adeya, Catherine (2002) ITs and Poverty: A Literature Review available at http://network.idrc.ca/ev.php?URL_ID=24718&URL_DO=DO_TOPIC&URL_SECTION=SECTION. Accessed September 24, 2004.

Aggarwal, Alok and Abhishek Pandey, 2004 *Offshoring of IT Services – Present and Future* Business Research, Evaluserve.

Arora, A. and S. Athreye. (2002). 'The Software Industry and India's Economic Development' *Information Economics and Policy*, 14, 253-273.

Aspray, William , Frank Mayadas, Moshe Y. Vardi, Editors 2006 *Globalization and Offshoring of Software* A Report of the ACM Job Migration Task Force

Bhatnagar, Subhash and Schwabe, Robert, eds., (2000) *Information and Communication Technology in Development: Cases from India*. New Delhi: Sage Publications.

Chandrasekhar C P., (2003) "The Diffusion of Information Technology and the Implications for Development: A Perspective Based on the Indian Experience"
http://www.networkideas.org/featart/feb2003/IT_Bangalore_Paper.pdf

The Economist 2004 "A Survey of Outsourcing" 13th November.

Kapur, Devesh, (2002) *The Causes and Consequences of India's IT Boom in India Review* 1(2), April pp. 91-110.

Kumar, Nagesh, (2001) "Indian Software Industry Development in International and National Development Perspective", *Economic and Political Weekly*, 36(45) 10 November, pp. 4278-90.

Kenney, Martin and Rafiq Dossani 2006 *Offshored Services, Innovation and Knowledge Intensity*, Keynote Presentaion at the Innovation in Services Conference, Manchester, UK, 15-18, June.

NASSCOM (2004), *The IT Industry in India: Strategic Review 2004* New Delhi: National Association of Software and Service Companies.

NASSCOM (2005), *The IT Industry in India: Strategic Review 2005* New Delhi: National Association of Software and Service Companies.

Tessler, Shirley, Avron Barr and Nagy Hanna, (2003) The Role of Software in IT Strategy, *The Electronic Journal on Information Systems in Developing Countries*, June.

Tojo Thatchenkery, Roger R. Stough, Govindasamy Balatchandirane and Rupa Ranganathan, 2005, "Information Communication Technology and economic development: the Indian context", in Tojo Thatchenkery and Roger R. Stough eds., *2005 Information Communication Technology and Economic Development: Learning from the Indian Experience* Cheltenham, UK and Northampton, USA: Edward Elgar, pp.29-46.

Wilson, Dominic and Roopa Purushothaman, 2003 *Dreaming With the BRICs: The Path to 2050* Goldman Sachs: global Economics Paper No: 99.

Table 1
Size of Worldwide offshore market in IT

Source	Data reported	Statistic
McKinsey & Co. (2005)	Amount of Onshore Outsourcing Worldwide as of 2001	\$227 billion
	Amount of Offshore Outsourcing Worldwide as of 2001	\$10 billion
	Amount of captive offshoring worldwide as of 2001	\$22 billion
	Number of IT services jobs globally that could be done anywhere in the world as of 2003	2.8 million
	Number of service jobs worldwide that could be done anywhere in the world	160 million
	Number of actual IT service jobs in offshore operations in low-wage countries as of 2003	371,000
Evalueserve (2004)	IT offshore revenue worldwide, April 2003-March 2004	\$17 billion (almost half from India, almost one-quarter from Ireland) (includes IT products shipped from Ireland)
UN Conference on Trade and Development (2004) (as quoted on TurkishPress.com)	percentage of world's largest 1000 companies offshoring business process outsourcing	30
	Value growth in offshore business process outsourcing worldwide (projected)	\$1.3 billion in 2002 to \$24 billion in 2007
Scholl (2003) (as quoted in World Investment Report 2004)	Market value for offshoring of IT services (not including captive production for multinationals)	\$1.3 billion
McKinsey & Co. (2003) (as quoted in World Investment Report 2004)	Market value for offshoring of IT services, including captive production for multinationals	\$32 billion

Source: Aspray, William, etal "Offshoring: The Big Picture" in Aspray, William , Frank Mayadas, Moshe Y. Vardi, Eds 2006

Table No 2
Graduate pool in India, FY 2003-04

Numbers	Engineering degree Holders	Engineering Diploma Holders	Arts Degree Holders	Science Degree Holders	Commerce Degree Holders	Total Graduates
Graduates (through 2003)	1,200,000	1,750,000	11,500,000	4,985,000	5,933,000	21,986,000
Graduates in 2004 (Estimate)	155,000	130,000	1,150,000	540,000	480,000	2,460,000

Source NASSCOM *Strategic Review 2005: The IT industry in India* (NASSCOM, New Delhi: 2005)

Table No. 3
Indian IT Sector: Labor Supply

(in '000)	2003-04	2004-05
Number of engineering graduates	215	284
Degree (4-year course)		
Diploma (3-year course)	112	155
	103	129
Number of IT (Computer Science, Electronics, Telecom) Professionals	141	165
Engineering IT graduates (Degree)	95	100
Engineering IT graduates (Diploma)	46	65
Number of IT professionals entering the workforce	80	94
Engineering IT graduates (degree)	55	58
Engineering IT graduates (diploma)	25	36
Number of non-IT engineers entering the IT workforce	40	40
Number of graduates (other disciplines)	30	30
Total fresh IT labor supply	150	164

Source NASSCOM *Strategic Review 2005: The IT industry in India* (NASSCOM, New Delhi: 2005)

Table No. 4

IT Industry-Sector-wise break-up

US \$ billion	FY 2004	FY 2005	FY 2006
IT Services	10.4	13.5	17.5
-Exports	7.3	10.0	13.2
-Domestic	3.1	3.5	4.3
ITES-BPO	3.4	5.2	7.2
-Exports	3.1	4.6	6.3
-Domestic	0.3	0.6	0.9
Engineering Services and R&D, Software Products	2.9	3.9	4.8
-Exports	2.5	3.1	3.9
-Domestic	0.4	0.8	0.9
Total Software and Services Revenues	16.7	22.6	29.5
Of which, exports are	12.9	17.7	23.4
Hardware	5.0	5.9	6.9
Total IT Industry (including Hardware)	21.6	28.4	36.3

Total may not match due to rounding off.

Figures for 2006 are estimates

Source <http://www.nasscom.org>.

Table No. 5

Employment figures-Software and Services sector

Sector	FY 2004	FY 2005	FY 2006
IT Services	215000	297000	398000
ITES-BPO	216000	316000	409000
Engineering Services and R&D and Software Products	81000	93000	115000
Domestic Market (including user organizations)	318000	352000	365000

*Figures do not include employees in the hardware sector
Figures for 2006 are estimates
Source <http://www.nasscom.org>.

Table No. 6
Employment for Global Operations in India by some Foreign Software Firms

Name of Firm and Nationality	Employment in India (date)	Global Employment	percent in India	Locations
Oracle, US	6,900 (2005)	41,658	16	Bangalore, Hyderabad
Microsoft, US	2,500 (2005)	57,000	4	Bangalore, Hyderabad
SAP, Germany	5,000 (2006)	38,802	15	Bangalore
IBM, US	53,000 (2006)	369,277	14	Bangalore, Delhi, Chennai
Veritas, US	900 (2004)	17,250	5	Pune
Adobe, US	500 (2005)	3,142	16	Delhi
EDS, US	5,000 (2005)	117,000	4	Chennai, Delhi, Mumbai
Cap Gemini, France	2000 (2004)	59,324	4	Mumbai, Bangalore
Comp Assoc, US	1,000 (2006)	16,000	6	Hyderabad

Source: Kenney, Martin and Rafiq Dossani 2006.

Table No. 7

The Extent and Impact of Offshoring in India

Indian national economic output attributable to the IT-ITES industry in 1997-98	1.2 percent
Indian national economic output attributable to the IT-ITES industry in 2003-04	3.5 percent
Indian IT industry revenue in IT services and software in 2003-04	60 percent
Indian IT industry in hardware in 2003-04	22 percent
Indian IT industry in ITES/BPO in 2003-04	18 percent
Growth in Indian IT and ITES exports	\$9.9 billion in 2002-03
	\$13.3 billion in 2003-04
IT and ITES export from India to the United States in 2003-04	69 percent
IT and ITES export from India to Europe in 2003-04	22 percent (mostly to the United Kingdom)
India IT services and software revenue in 2003-04	\$12.8 billion (29.6 percent increase over previous year)
Jobs added to Indian IT services and software sector in 2003-04	98,000 (more to domestic companies than multinationals)
Growth in Indian IT services revenue	\$1.9 billion in 2002-03
	\$2.5 billion in 2003-04
Growth in Indian offshore product development exports (includes exports of software products made by Indian companies)	\$560 million in 2002-03
	\$710 million in 2003-04
	(mostly produced by multinational captives)

Multinational companies that opened captive centers in India since early 2001	230
Value of research conducted by Indian captives of multinationals in 2003-04	\$800 million to \$1 billion
Value of research conducted by Indian captives of multinationals in 2008 (projected)	\$11 billion
Call center seats	96,000 in 2003; 158,000 in 2004

Source: NASSCOM Strategic Review 2005