



CAN IT AND ITES BE AN ENGINE OF GROWTH? AN EMPIRICAL ANALYSIS

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Abstract: India emerged as one of the fastest growing economies of the world during the 1990s because of the spectacular dynamism shown by the services sector. India's services sector has been burgeoning fast and one of the major driver's of the growth of services sector is Information Technology (IT) and Information Technology Enabled Services (ITES). It is well documented in literature that IT impacts growth by different channels. In this study we try to empirically verify the question: Can IT and ITES be an engine of growth? Using micro-level data of 100 households of 20 IT and ITES firms along with secondary data we tried to estimate the extent of indirect employment generation at macro-level and the share of IT and ITES in total employment and total value added. According to our study, one job for skilled professional employed in IT and ITES spins off jobs for 0.48 semi-skilled, low skills or unskilled workers. As per our estimates, the 16 lakh workers who are expected to be directly employed in IT sector in the FY 2008 would generate secondary employment for 7,68,000 people which would constitute 0.16% of total employment. However, the share of consumption expenditure of 16 lakh professionals would be 20% of total value added. Assuming the consumption expenditure of the IT and ITES workers and total value added to be the same/constant when we tried to assess the contribution of consumption expenditure of 2.3 million workers (who are projected to be directly absorbed by IT sector by 2010, NASSCOM, 2005) to total value added it comes out to be 29% of total value added. The study says that the proportion of IT-ITES in total employment may be small but its contribution to total value added is still very high. Indeed IT and ITES can be an engine of growth in India's economy by way of generating demand impulses in the economy as has been hypothesised and shown through the present study. Keeping in view the contributions of this sector and its huge untapped potential as evident from the present study and various other studies, there is a need for introduction and implementation of policy initiatives to address the challenges faced by this sector and to sustain the growth driven by the services sector.

Keywords: *fastest growing economies; spectacular dynamism; the services sector; burgeoning fast; major driver's of the growth; IT and ITES engine of growth; employment generation.*

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INTRODUCTION

India emerged as one of the fastest growing economies of the world during the 1990s mainly because of the remarkable performance of the services sector. India's services sector has shown highly impressive growth being driven primarily by the Information Technology (IT) and Information Technology Enabled Services (ITES). India became 10th largest exporter of services (Prasad, 2007a) in the world in the year 2007. As per the Global Services Location Index 2007, India has emerged as a top destination for off shoring. "The country continues to be the 'nerve-centre' for global sourcing with over 2/3rd of the Fortune 500 and a majority of the Global 2000 firms leveraging global service delivery-now sourcing from India" (NASSCOM, 2008). Not only this, the WNS '2008 Global Outsourcing 100' survey reveals that 20 Indian companies are among the world's top hundred in outsourcing (The Hindustan Times, 3 May 2008).

Though the impact of IT sometimes fails to be visible, "the country's IT industry reflects in every way possible the vibrancy of India shining" (Natrajan, 2004, p.14). Indian IT companies rode high on the growth wave as is reflected by the fact that four Indian companies joined the billion dollar club viz. Tata Consultancy Services (TCS), (July 2003) and Infosys, Wipro and Bharati Televenture (telecom player) in April 2004. TCS was the first company to touch \$1 billion in yearly revenue, and subsequently it became the first to touch \$1 billion in one quarter in 2007 (De, 2007). That India has been on the global companies' radar for quite some time gets further reflected in the fact that more than 15 Chief Executive officers (CEOs) of leading IT and Telecom companies visited India in less than five months in 2007 (Prasad, 2007b).

The IT industry is growing at a rapid pace. The direct impact of the IT industry

on development is tremendous and its potential is huge. The share of IT and ITES in Gross Domestic Product (GDP) increased from 1.2% in 1997-98 to 5.5% of GDP in the financial year (FY) 2008. Exports increased from \$4.8 billion in 1997-1998 to \$64 billion in FY 2008. Not only this, this sector is expected to directly employ 1.6 million professionals in FY 2008. In addition to direct employment, this sector is expected to generate huge indirect employment also. As per NASSCOM (2005) estimates, 2.3 million direct and 6.5 million indirect jobs will be created by this sector by 2010. Given the rate at which this sector has been growing, the Indian IT industry is definitely gearing up to scale new heights.

The spectacular performance of IT and ITES segment of the services sector along with its huge untapped potential motivated us to empirically verify whether IT and ITES could be an engine of growth? To answer this question we begin by providing a brief overview of the literature on linkages between IT and economic development. Section 3, provides the IT landscape in India. In Section 4, the research question is raised. Section 5 discusses sources of data, methodology and the empirical results have been reported in Section 6. Section 7, gives conclusions and policy implications.

IT AND ECONOMIC DEVELOPMENT

Identifying the drivers of economic growth ranks among the most important issues that economists have focused on. Several studies in Pohjola (2001) have found significant returns on ICT investments in developing as well as developed countries. The spectacular success of the IT industry in India has stimulated interest among academicians on the potential role that IT can play in India's economic development (Adeya, 2002; Arora and Athreye, 2002; Bhatnagar and Schware,

2000; Chandrasekhar, 2003; Kumar, 2001; Kapur, 2002; Richter and Banerjee, 2003; Saith and Vijayabaskar, 2005; Tessler et al., 2003; Thatchenkery and Stough, 2005). Some are of the opinion that the Indian case study could serve as a useful model for other developing countries (Tschang, 2001). Some other studies (Miller, 2001), using India as an example attempt to evaluate the potential benefits that the internet and more broadly, the IT industry promises to bring to developing countries.

Having explained in brief the linkages between IT and growth and development, let us examine the growth performance of IT and ITES in particular in the post-reform period in India's economy.

IT LANDSCAPE IN INDIA

In the present section, we have provided an overview of the contribution of the IT-sector in India's economy. We will take up the composition of the IT market first as has been given by National Association of Software and Services Companies (NASSCOM) and will proceed on to discuss the contribution of this segment of the service sector to economy.

Composition of IT market in India

Coming now to the composition of the IT market in India, there are two components of the Indian IT market: domestic IT market and IT exports. The IT-ITES industry has been divided into three segments, viz. IT services and software, ITES-BPO and hardware.

Globally, the non-IT outsourcing segment is referred to as Business Process Outsourcing (BPO). In India, this segment is referred to as ITES (NASSCOM, 2005b). ITES refers to those outsourcing services, which are processed and delivered with the

use of IT. BPOs comprise of diverse activities such as human resource, accounting, financial research, marketing, sales, legal work, logistics and so on.

Contribution of IT in rapid growth of Indian economy

IT industry is an outstanding performer of the Indian economy. Strong demand over the past few years has placed India amongst the fastest growing IT markets in the Asia-Pacific region. The Indian software and IT industry has registered a Compound Annual Growth Rate (CAGR) of 28% during the last five years (Government of India, 2007-2012.).

The following sub-section shows the contribution of IT industry to GDP, to revenue generation, the generation of foreign exchange and that of employment.

IT and GDP

During the decade of 1990s, the rise of IT industry in India was a remarkable achievement of the Indian Economy.

Table 1 shows the growth of the Indian IT industry from FY 1997-1998 to 2008. As is evident from the table, the IT industry in India accounted for a marginal share of India's GDP in the FY1997-1998, but it has been rising very fast. The share of IT industry was just 1.2% of GDP in 1997-1998. It is expected to increase to 5.5% of GDP in the FY 2008. The NASSCOM - McKinsey Report (1999) projected that by 2008, this sector would contribute a 7.7% share to GDP. NASSCOM (2005a, p.80) says

"The IT and BPO industries can become major growth engines for India, as oil is for Saudi Arabia and electronics and engineering are for Taiwan. Saudi Arabia's oil exports accounted for 46% of GDP in 2004; Taiwan's electronics and

Table I Growth of Indian IT Industry# and its share in National GDP (FY 1997–2006E)

Year	Growth of Indian IT Industry (in US\$ billion)	Share in National GDP (%)
1997–1998	4.8	1.2
1998–1999	6.0	1.5
1999–2000	8.2	1.9
2000–2001	12.1	2.7
2001–2002	13.4	2.9
2002–2003	16.1	3.2
2003–2004	21.6	3.5
2004–2005	28.4	4.1
2005–2006E	36.3	4.8
FY 2007E*	47.8	5.4
FY 2008E**	64	5.5

Note: # IT industry includes hardware, software and services and related business Services

Source: NASSCOM, *Strategic Review* 2006, 2007, 2008

*see NASSCOM, *Strategic Review*, 2007.

**see NASSCOM, *Strategic Review*, 2008.

engineering exports accounted for 17% of GDP in the same year. India's IT and BPO industries could account for 10–12% of India's GDP by 2015.”

Revenue generation from IT industry

It is important to point out here that the revenue generation from the total software and services segment (exports as well as domestic) is expected to be \$39.7 billion in the FY 2007 of which exports are expected to be in the range of \$31.3 billion (see Table 2). We are likely to touch \$60-billion mark (by 2010) as per NASSCOM estimates (see Joshi, 2008b).

IT and ITES: an important source of foreign exchange (FOREX)

Indian IT and ITES have played an instrumental role in the building up of foreign exchange reserves for India and the trend in the build up clearly reflects the growth of IT and ITES exports from India (NASSCOM, *Strategic Review*, 2006). IT and ITES has emerged as a key contributor

to the FOREX earnings of India. Its share in total receipts from trade in invisibles nearly doubled over the last five years, as per the *Strategic Review*, 2006. The IT and ITES exports increased from \$6.2 billion to \$23.9 billion while FOREX earnings went up from \$42.3 billion to the projected \$139 billion in the financial Year (FY) 2006 (See Table 3). IT and ITES exports further increased to \$31.3 billion in the FY and the FOREX reserves increased to US\$272.3 billion (*Monthly Monitor*, 2007).

Coming now to the Indian economy, ICTs spearheads globalisation process. It is being seen as the new engine of growth. The recent surge in services during the last two decades has been attributed mainly to high productivity services such as IT services and ITES (like BPOs, KPOs, MBPO, LPOs, RPOs, ESO, HRO¹, etc.). At present, India exports software and services to nearly 95% countries around the world. North America (USA and Canada) accounts for 61% of our software exports. It is heartening to note

Table 2 Sector wise Break-up of IT Industry Export Earnings (in \$ billion)

Revenues (US\$ billion)	FY 2004	FY 2005	FY 2006	FY 2007
IT Services	10.4	13.5	17.8	23.7
-Exports	7.3	10.0	13.3	18.1
-Domestic	3.1	3.5	4.5	5.6
ITES-BPO	3.4	5.2	7.2	9.5
-Exports	3.1	4.6	6.3	8.3
-Domestic	0.3	0.6	0.9	1.2
Engineering Services and R&D, Software Products	2.9	3.9	5.3	6.5
-Exports	2.5	3.1	4.0	4.9
-Domestic	0.4	0.8	1.3	1.6
TOTAL Software and Services	16.7	22.6	30.3	39.7
Revenues of which, exports	12.9	17.7	23.6	31.3
Hardware	5.0	5.9	7.0	8.2
Total IT industry (including Hardware)	21.6	28.4	37.4	47.8

Source: NASSCOM, *Strategic Review*, 2007.

Table 3 Growth of Indian IT-ITES# FY 2001–06 (US\$ billion)

FY	IT-ITES Exports (\$ bl)	FOREX Reserves (\$ bl)
2001	6.2	42.3
2002	7.6	54.1
2003	9.9	75.4
2004	13.3	111.7
2005	18.2	131.2
2006E	23.9	139.0*
FY 2007**	31.3	272.3

Note: # includes hardware, software and services and related business services exports

Source: RBI, NASSCOM, *Strategic Review*, 2006

*Forex Reserves as on 06 January 2006.

**For IT and ITES exports see NASSCOM, *Strategic Review*, 2007 and for FOREX reserves *Monthly Monitor*, November 2007.

that in 1999–2000, more than a third of Fortune 500 companies outsourced their software requirements to India.

IT and employment

Studies show (Sarkar and Mehta, 2008; Thomas, 2005) that the contribution of

ICT employment to the total is still very minimal. As per estimates of Sarkar and Mehta (2008), the ICT sector accounts for just 0.3% of total employment. The ICT sector employed 700,000 (0.700 million) persons which is a miniscule of the total employment in the economy which was 324.7 million workers in India by Usual

Principal Status in 1999–2000. But there are studies which show that there is a huge potential for employment generation in this sector (All India Management Association and The Boston Consulting Group, 2003; NASSCOM, 2005a).

Table 4 indicates that in the IT and ITES sector, the number of knowledge professionals employed has grown from 0.284 millions in the financial year 1999–2000 to 1.287 millions by end of 2005–2006.

RESEARCH QUESTION

The motivation for this research is that the services sector and IT and ITES sector in India are booming, but can IT and ITES be an engine of growth? We argue in this paper that services especially IT and ITES can be an engine of growth in the case of India by generating employment opportunities and contributing to the overall GDP growth.

The growth of IT and ITES can impact the overall growth of the economy through inter-sectoral linkages by generating demand impulses in the economy. There would be consumption demand as well as production demand on the one hand (which will boost the growth of the rest of

the economy) and direct employment generation for the skilled workers on the other. The consumption demand, production demand and demand for skilled workers will result into generation of secondary/indirect employment in the service sector. As IT and ITES grow, there would be increased spending by employees of this segment on food items as well as non-food items. It is this spending by IT-BPO employees on food, apparel, clothing, durable goods, travel, health and medical care and real estate services which would boost production demand and consequently lead to higher GDP growth on the one hand and employment generation on the other. It is direct and indirect employment generation by putting purchasing power in the hands of people can contribute to change in economic conditions and rise in per capita living standards. Figure 1 depicts how IT-ITES growth can impact the rest of the economy through inter-sectoral linkages.

In the present study we have made an attempt to explore and estimate an unexamined relationship/inter-sectoral linkages between growth of IT and ITES and overall growth of the economy by collecting and analysing the primary survey data and combining that with secondary data.

Table 4 Growth of IT – ITES professionals in India

Indian IT Sector : Knowledge Professionals Employed* (in millions)							
(Nos.)	1999– 2000	2000– 2001	2001– 2002	2002– 2003	2003– 2004	2004– 2005E	2005– 2006E
IT, Engineering and R&D Software Product Exports	0.110	0.162	0.170	0.205	0.296	0.390	0.513
IT-enabled Services Exports	0.420	0.700	0.106	0.180	0.216	.316	0.409
Domestic Sector	0.132	0.198	0.246	0.285	0.318	0.352	0.365
Total	0.284	0.430	0.522	0.670	0.830	1.058	1.287

Note: *Does not include employee numbers related to the hardware sector

Source: Government of India (2007–2012), *Eleventh Five Year Plan*, New Delhi, India.

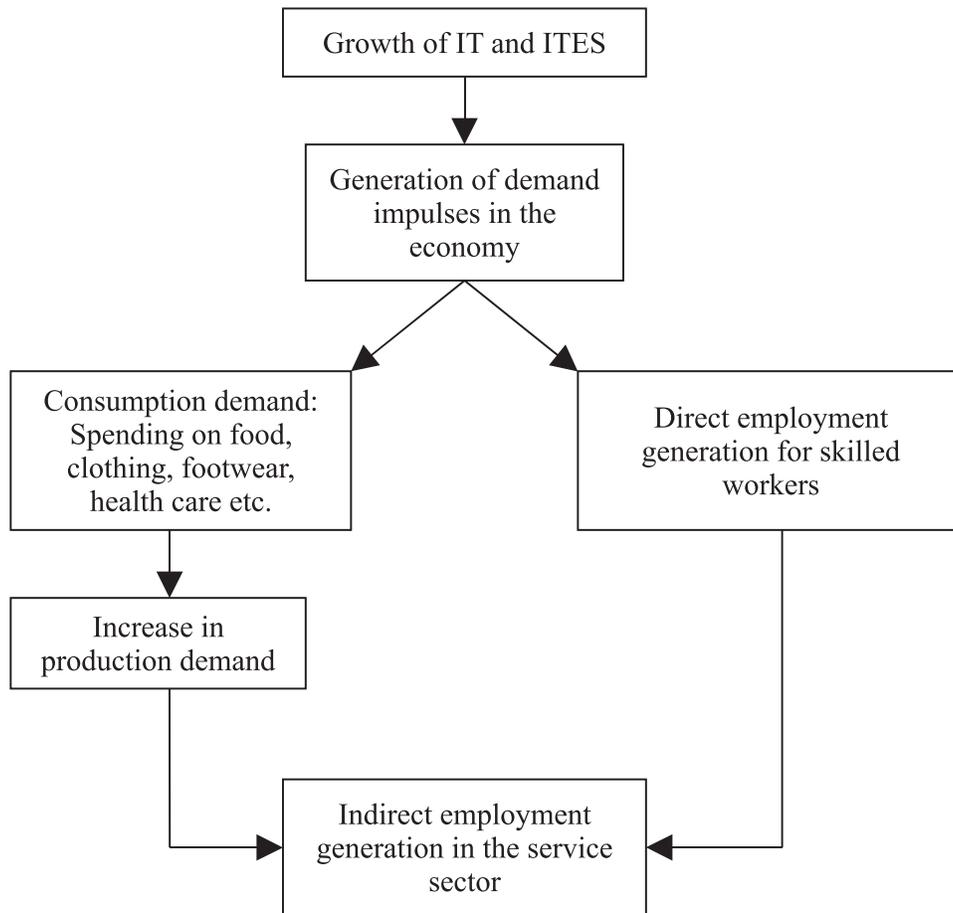


Figure 1 IT, ITES and Rest of the Economy: Inter-Sectoral Linkages

SOURCES OF DATA AND METHODOLOGY

At the outset it is pertinent to mention that, at present Central Statistical Organisation does not give us a separate contribution made by IT and ITES sectors in its National Accounts Statistics (NAS). It is NASSCOM data reports which give us the figures for the IT and ITES sector. We have relied on NASSCOM data while carrying out this study. The main secondary sources of data for IT and ITES were the various reports of NASSCOM. We have also made use of data from Government of India, The Economic

Survey, World Development Indicators, and journals like Dataquest, etc.

This study is based on primary data collected from 100 respondents of 20 IT and ITES firms located in Gurgaon. Gurgaon is a satellite city around Delhi and is a hub for many multinational corporations (MNCs) and Indian firms especially in the area of call centers and back-end processing. It is interesting to note that the Government of Haryana has set up an Electronic city in Gurgaon spread over an area of 40 acres for hi-tech and export-oriented electronics/IT

industry. A Software Technology Park is being developed over an area of 14,000 square feet within the Electronic city (NASSCOM-KPMG, 2004, p.164). Questionnaires were personally administered to 100 respondents drawn from 20 firms and filled up by a trained interviewer.

EMPIRICAL RESULTS

Finally in Table 5, using micro-level data of a hundred households of 20 IT and ITES firms and combining that with macro level data, the focus of the study: can IT and ITES be an engine of growth has been examined. The main findings of the study are:

- 1 A micro-level study done in the Gurgaon region shows that the direct employment of one IT-ITES professional results into indirect employment generation for 0.48 semi-skilled, low skill or unskilled workers². Taking this figure of 0.48 and using NASSCOM data of 16 lakh (1.6 Million) professionals who are expected to be directly employed in the IT industry (FY, 2008), we project/estimate that there would be indirect employment generation to the extent of 768,000 (people) at the macro level. Using total employment figures of 460.43 million (on Usual Principal Status basis) as given in Mitra (2008 for the year 2004-2005), we found that the indirect employment in IT and ITES would constitute 0.16% of the total employment whereas the share of direct employment would be 0.34% of total employment in India's economy.
- 2 Similarly from micro-level data on per capita per household average monthly consumption expenditure, we calculated the annual food, non-food expenditures and expenditure on services per capita per household. Then we tried to compute the shares of these consumption expenditures incurred by IT and ITES employees in the

value added from agriculture, manufacturing and services (using data on value added given by the Economic Survey). Using those shares we tried to find out the contribution of 16 lakh employees to the agriculture, manufacturing and services value added. Adding these together we arrived at the consumption expenditure of 16 lakh workers. According to our estimates the share of consumption expenditure incurred by 16 lakh employees (expected to be employed in IT sector in the year 2008) would be 20.19% total value added.

It is quite obvious from the above table that direct employment of 16 lakh workers would help to generate indirect employment for 768,000 workers. The consumption expenditure of 16 lakh professionals would account for a 20.19% share of total value added. Assuming that the consumption expenditure of the IT and ITES workers and the total value added to be the same, one can try to assess the contribution of 2.3 million workers (who are expected to be directly absorbed by the IT sector by 2010 as per estimates given in NASSCOM, 2005) to consumption expenditure and the share thereof in total value added. It turns out to be 0.29% of total value added.

To sum up, as per our study a miniscule 0.34% of the total workforce expected to be employed in the IT-ITES will contribute 20.19% to value added through consumption expenditures. The results of the present study clearly support our hypothesis that IT and ITES can indeed be an engine of growth through generating demand impulses in the economy.

CONCLUSIONS AND POLICY IMPLICATIONS

India emerged as one of the fastest growing economies of the world during the 1990s

Table 5 Contribution of IT and ITES to employment and consumption expenditure at Micro and Macro-Level

Contribution of employees of IT and ITES to	Contribution of single employee of IT and ITES at Micro level (as estimated from sample survey)	Projections of Contribution of IT and ITES at Macro level (16 lakh)
1. Indirect Employment Generation	0.48	$0.48 \times 1,600,000(\text{FY } 2008) = 768,000$
Share of IT and ITES in total employment		$768,000/460,430,000 \times 100 = 0.16\%$
2. Consumption Expenditure	Rs. 13,952pcphh	Rs. 107,625.4396 + Rs. 101,039.069 + Rs. 84,836.223 = 293,500.7316
Contribution of Consumption Expenditure of 16 lakh IT and ITES to total value added		$293,500.7316/1,453,109 \times 100 = 20.19\%$
a. Average monthly Expenditure on Food Items	Rs. 3,299 pcphh	i. Annual Food Exp = $3,299 \times 12 = 39,588$ ii. Share of IT and ITES in value added from agriculture = $39,588/588,530 = 0.0672$ iii. Contribution of 16lakh IT Professionals to Value added from Agriculture = Rs. 107,625.4396
b. Average monthly Expenditure on Non-Food Items	Rs. 3,725pcphh	i. Annual Non-Food Expenditure $3,725 \times 12 = 44,700$ ii. Share of IT and ITES in value added from Manufacturing = $44,700/707,845 = 0.0631$ iii. Contribution of 16lakh IT Professionals to Value added from Manufacturing = Rs. 101,039.069
c. Average monthly Expenditure on Services	Rs. 6,928pcphh	i. Annual Expenditure on Services = $6,928 \times 12 = 83,136$ ii. Share of IT and ITES in value added from services = $83,136/1,567,934 = 0.0530$ iii. Contribution of 16lakh IT Professional to Value added from Services = Rs. 84,836.223

Notes:

- i) One IT and ITES professional (not the household) hires 0.48 workers with different levels of skills. The question posed to the respondent was: Do you hire workers with different levels of skill?
- ii) pcphh stands for per capita per household
- iii) We have made projections for 16 lakh professionals because as per NASSCOM, *Strategic Review 2008*, IT sector is expected to directly employ 1.6 million professionals in the FY 2008.
- iv) Non-food items include apparel, tailoring, footwear, personal care items, etc.
- v) Services include education, health, leisure, tourism, communication services, etc.
- vi) Total value added figures have been taken from *The Economic Survey, 2007–2008*. The figures are quick estimates of 2006–2007.
- vii) Total employment in the economy (in 2004–2005), by Usual Principal Status was 460.43 million / 460,430,000(see Mitra, 2008).

Source: Based on the Field Survey Data, NASSCOM (2008) and Mitra (2008) (see Joshi, 2010b)

because of the remarkable performance of the services sector. India's services sector has been burgeoning fast and one of the major driver's of the growth of the services sector is IT and ITES. It is well documented in literature that IT impacts growth by different channels. In this study we try to empirically verify the question: Can IT and ITES be an engine of growth? Using micro-level data of a hundred households of 20 IT and ITES firms and combining this with macro level data, the present study points out that the proportion of IT-ITES in total employment may be small but the contribution of this to total value added is still very high. The point worth appreciating is that this sector came to the fore after 1991 (BPOs in 1993) and within 15-17 years the contribution of this sector to our economy is really commendable whether to GDP, revenue or foreign exchange generation and employment (though it may be minimal at present). There is a huge potential of growth in this sector as is apparent from this study and as has been reported in various studies (Joshi, 2006b, 2010b).

In view of the above-mentioned findings of the study indicating the huge employment generation potential of IT and ITES and the contribution of this sector to value added, there is an urgent need to handle the challenges faced by this sector. It is important to point out here that the sustainability of the impressive growth of the Indian economy has been questioned in the context of some persisting challenges in the form of lack of social infrastructure (Joshi, 2003, 2006d), physical infrastructure; IT infrastructure (Joshi, 2006a, 2008b), agricultural and industrial sector reforms, rupee appreciation and U.S. sub-prime crisis, increasing regional disparities (reflected in digital divide), etc. All these problems can adversely affect the IT and ITES growth. Besides, there are challenges peculiar to the field of IT and ITES like rising labour

costs, rapid growth in demand for talented manpower/quality staff, high attrition rate, outsourcing backlash etc are some other limiting factors (Joshi, 2006c, 2008a). The growth of IT and ITES is having social, economic, health, ethical and environmental implications also (Joshi, 2006c, 2008c). Further, delay in the promotion of conducive/enabling business environment and good governance will disqualify us from catching up with the global giants in terms of world-wide presence and scale. Recent "The Satyam saga raises serious questions about the key parts of India's financial ecosystem" (Srinivas, 2009, p.29). The bigger question that needs to be addressed in the light of this corporate fraud of an entrepreneurial firm like Satyam is: what kind of business environment and business culture will help to promote and demonstrate good corporate good governance. It is also important to point out here that the measurement of output, productivity, non-availability of data or availability of data after a time lag are the other problems confronted with in the case of services in general and IT-ITES in particular. The problem gets further compounded because these new species of services (like IT, ITES, etc.) are new entrants in the national accounts and there is a lack of development of concepts. Further, the quality of each unit of the same service varies from the others. Therefore, it is too difficult to achieve the same level of output in terms of quality as has been pointed out in Cowell (1984). Further, quality improvements stemming from the application of new technologies are extremely hard to measure (Joshi, 2008d). In view of the above problems which can adversely impact the growth of the high potential IT and ITES segment; there is an urgent need for policy intervention to address the above-referred problems if India is really keen to sustain a growth driven by the services sector in India.

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NOTES

¹ BPOs stands for Business Process Outsourcing, KPOs for Knowledge Process Outsourcing, MBPOs for Medical Business Process Outsourcing, LPOs for Legal Process Outsourcing, RPOs for Research Process Outsourcing , ESOs for Engineering Process Outsourcing and HROs for Human Resource Outsourcing.

² We would like to point out here that the semi-skilled, low skill or unskilled workers were hired by the respondent and not by the other members of the household. Even if is argued that these workers were hired not by the respondent but by other members of the HH, the fact remains that it is only when household income got supplemented that these different categories of low skill workers were hired.