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# Heterogeneity in Indian IT-ITeS industry: is a uniform policy enough?

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**Abstract:** The astounding success of India's IT-ITeS industry has identified itself as one of the major strategic areas for future development. Considering the fact that the initial growth of this sector came through software development, policies undertaken for this sector to date exhibit significant software centricity. Based on firm-level granular data, this paper argues that over the period, with the increasing presence of ITeS segment comprising primarily call centres, BPOs and medical transcription units, the IT-ITeS industry as a whole has transformed into a heterogeneous sector. Given the relatively less requirement of technical know-how, the ITeS firms appear to be more suited for the Indian economy that inherits a huge amount of unskilled labour force. Therefore, it is time the policymakers realise the changing dynamics of the industry and take appropriate 'segment-specific' policies so that the industry can sustain its competitive edge.

**Keywords:** India; industry; software; IT enabled services; ITeS; heterogeneity, policy.

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## 1 Introduction

India's unprecedented success in a technology intensive sector like IT-ITeS[1] has attracted global attention of researchers and industry analysts (Zhao and Watanabe, 2010), given its predominant agrarian structure, per capita income being one of the lowest in the world and excessive dependence on low-wage, commodity-based exports (Parayil, 2006). Outsourcing of production in information technology has become an integral part of contemporary globalisation (Aranya, 2008) and India is leading in this direction, being the largest recipient of global sourcing market, with a market share of 55% in 2010, an increase from 51% in 2009 (Information Technology Annual Report, 2010–11). Further, it is also the most preferred location on account of the variety of services on offer, encompassing IT software, IT services and ITeS-BPO (Joshi and Mudigonda, 2008). Expectedly, India's technological prominence in the IT-ITeS sector has provided ample employment opportunities (Dongier and Sudan, 2010). World Bank attributes this success to four factors – cost arbitrage, English speaking ability, ease of doing business and segment-specific expertise (Garry, 1999) with the last two playing a dominant role. Emphasis on the segment-specific expertise in the Indian context perhaps owes its origin to the evolution of the industry wherein firms concentrated on software development on one hand and a dedicated efforts towards fostering software development on the policy front on the other (Sarma and Krishna, 2010). While software development continues to occupy a dominant position in the Indian IT-ITeS industry, the industry has become increasingly heterogeneous over the years with the emergence of the ITeS sector encompassing business process outsourcing (BPO), call centre and medical transcription units. In fact, heterogeneity in the industry is such that it won't be an exaggeration to consider various segments of the industry as different industries altogether (Coward, 2002). This changing dynamics of the industry has so far not received its due attention from both policymakers and academia. Such ignorance harbours in the risk of overlooking the need for undertaking certain segment-specific policies, which may ultimately appear crucial in maintaining the competitiveness of the industry as a whole.

A major problem of addressing the issue of heterogeneity emanating from the changing dynamics of the IT-ITeS sector is the paucity of granular or firm-level data. This study attempts to bridge this gap (at least partially) by highlighting the increasing heterogeneity of the industry drawing solely from firm-level data collected from Software Technology Park (STP) Kolkata,[2] one of the nodal centres of its parent body Software Technology Parks of India (STPI).

We initiate the discussion by highlighting the policies that has been initiated for this industry since inception with a view to reiterate the lack of any segment-specific initiatives undertaken over the years in Section 2. Section 3 underlines the contours of

heterogeneity so as to justify the need for segment-specific policies. Section 4 provides a brief description of STP scheme and the structure of data set, which has been collected solely from STP Kolkata. We explore the dynamics of heterogeneity in the industry in Section 5. Concluding observations are drawn in Section 6.

## 2 The policy framework: Indian IT-ITeS industry

Policy framework of the IT-ITeS industry followed a structuralist model till the 1970s (Heeks, 1996) and at least till 1984, restrictive policies ensured that there was no software industry (Parthasarathi, 2004). Thereafter till 1990, there was a wave of liberalisation that gathered momentum since the early 1990s when liberalisation measures were initiated in July 1991 in the wake of severe balance of payments (BOP) crisis. Heeks (1996) and Parthasarathi (2004) have provided a detailed account of various policy initiatives and we abstain from reproducing the same. Instead, we present only the highlights so as to bring to light software development centricity in the policies which, to us, may appear to be a major concern in forming appropriate IT-ITeS policies in near future.

### *2.1 Phase I: prior to 1980*

The origins of what might be called a computer policy dates back to 1963 with the setting up of Electronics Committee of India following India's defeat to China with a view to strengthen the technological base of electronics. The Department of Electronics (DoE) and Electronics Commission (EC) were established in June 1970 and February 1971 respectively, with the latter replacing the Electronics Committee as the principal policy-making body. With this development, there was a shift in policy emphasis towards achieving self-reliance in technological capabilities through import substitution.

Restrictive policies coupled with ongoing crunch in foreign exchange earnings constrained the import of computers. To ease out the import process, the DoE launched Software Export Scheme in 1972, which gave provision of hardware imports in exchange for software exports subject to the fulfilment of export obligation of five times the value of imports to be achieved in the next five years. The export obligation was later on eased in 1974 to twice the value of imports to be achieved in the next five years. Under the revised guidelines, Tata Consultancy Services (TCS) was the first firm that secured permission to import hardware in exchange for software exports.

Other policy initiatives taken in this period included (Heeks, 1996):

a investments in public sector research and development (R&D) projects that involved software development

b granting majority of public sector contracts for customised software to Indian firms

c fostering training and development in software in universities and technical institutions

d to boost NRI investment, NRIs were permitted to set up software firms in India with an export obligation of only 100% of the value of imports

e hardware import duties slashed from 100% to 40%

f banks were encouraged to extend loans for software projects

g software exporters were assured faster clearances of applications.

However, the ramifications of these policy initiatives were not at all satisfactory.

Exports were not forthcoming, notwithstanding the fact that as many as 441 computers were imported during 1976–77 to 1980–81, for a plethora of reasons like evasion of export obligations, abstaining from exports and leasing of computers in the domestic market and lack of proper monitoring on the part of Chief Controller of Imports and Exports (CCI&E).

### *2.2 Phase II: 1981 to 1984*

It did not take long for the DoE to realise that imported computers were not used for the right purposes. However, apart from temporarily banning the import of second-hand machines, nothing much could be done until the formation of the Rajaraman Committee in January 1981 that ushered in tighter policy guidelines in terms of greater government control, tighter inspections, and threats of confiscation of computers in case of non-fulfilment of export obligations. It envisaged optimum utilisation of existing domestic capacity of computers first (in light of the large installed base of imported computers domestically), before going in for additional imports. Nevertheless, in cases wherein the DoE found that no domestic capacity existed, proposals for import would fall under three categories with export obligations remaining unaltered for category A (ordinary import) and category B (import by NRIs) with addition of category C (import on loan basis) that had limited export obligation. These measures were partially successful in terms of decline in approvals for import from 19 in 1981–82 to 4 in 1983–84. Yet, the entire system was cumbersome, though it did not deter DoE's training or investment efforts or its desire to boost exports (Heeks, 1996; Parthasarathi, 2004).

### *2.3 Phase III: 1984 to 1986*

Liberalisation measures were initiated through the New Computer Policy of 1984 with major thrust on hardware to foster indigenous manufacturing capabilities with a view to aid software development. Apart from making imports of hardware cheaper and quicker, it also aimed at improving access to imported software (Heeks, 1996, Parthasarathi, 2004).

On the whole, the Computer Policy of 1984 had mixed results. Though it succeeded in easing the availability of microcomputers (the production of which increased tenfold in two years), bureaucratic hurdles and policy confusion emanating partially from policy makers' limited understanding of the industry continued to affect the software industry (Parthasarathi, 2004).

To dispel the concerns of the industry, the Computer Software Export, Development and Training Policy was launched in 1986 with the objective of promoting the domestic software industry so as to make it internationally competitive. Substantial liberalisation measures were initiated, yet these did not lead to a favourable BOP position.

### *2.4 Phase IV: 1987 to 1990*

This phase witnessed significant modifications in the existing policy measures, which covered three main areas:

a Trade: Indian firms were allowed to become distributors of foreign software – a process known as 'stock and sale'.

b State controls: In 1987, it was announced by the Software Development Authority that firms must get themselves registered with the DoE to receive assistance in export promotion. However, this process was effectively restricted to large firms.

c Promotional measures: This included creation of The Electronics and Software Export Promotion Council (ESC) to foster exports of electronic goods and software by providing marketing assistance; Establishment of STPs in 1990 to facilitate offshore provisioning of software and services; and formation of NASSCOM, the industrial body in 1988.

Nevertheless, the policy initiatives portrayed a sense of loss of direction.

### *2.5 Phase V: 1991 to 2000*

Following the establishment of the STPs, the Indian economy witnessed a severe BOP crisis in mid-1991. In order to counter the crisis, radical changes in economic policies were introduced which included among others, trade liberalisation, openness to foreign investment, relaxation of entry barriers to new firms and devaluation of the rupee. These changes brought about in the economy following the establishment of STPs attracted multinationals[3] (like never before) to set up their Offshore Development Centres (ODCs) in India. There was a greater focus on services rather than products largely to tap the burgeoning export market of services. The demand for software and services was at its peak, thanks to large scale outsourcing, primarily to resolve the Y2K problem or the 'Millennium Bug' (Athreye, 2002).

### *2.6 Phase VI: post 2000*

The liberalisation measures initiated in the early 1990s were maintained. In addition, The Information Technology Act 2000 was initiated so as to provide security to the cyber user by according legal recognition to electronic commerce. During this period, the industry witnessed consolidation like never before, with increasing M&A activity, especially amongst big and mid-sized players of the industry. Alarming wage inflation, rising infrastructural costs, upsetting attrition rates were some of the new trends that surfaced, which lured many players to venture into tier-II and tier-III cities. The STP scheme, which facilitated offshore provisioning of services was discontinued on 31st March 2011. This was a major blow to the industry, and will impact the smaller players the most. The Union Budget of 2011 raised the Minimum Alternative Tax (MAT) from 18% to 18.5% applicable to units in Special Economic Zones (SEZs) and SEZ developers. These developments would intensify the concentration of the industry further.

## 3 Difference between software development and IT enabled services

In most of the studies centering around the Indian IT-ITeS industry, the terms 'IT' and 'ITeS' are used interchangeably (Mitra, 2009). However, the industry body NASSCOM classifies the IT-ITeS industry into three broad segments, namely IT software (renamed

as software products and engineering services), IT services and ITeS-BPO. Software development comprises IT software and IT services while the rest is IT enabled services (ITeS) (NASSCOM, 2010).

IT software (also referred to as software products/packaged/generic software) entail hard-core programmes and are usually available shrink-wrapped in CDs. They have a large user base. Typical examples would include Microsoft Office, Adobe's Page Maker and Photoshop, etc. The fixed cost of producing such software is huge, although the marginal cost of reproduction is almost negligible (amounts to the cost of a blank CD for example). As a result, the cost of producing one copy or a million copies is almost the same. Hence, a product company would always prefer to sell as many copies of a particular product as it can without customising the product to suit the requirements of any specific user. In doing so, software product companies reap standard economies of scale and their profits increase as the market share rises (Niosi et al., 2012).

In contrast, IT services (also referred to as customised software) are software developed to suit the requirements of a client. Customised software is produced both in-house or under contract for large clients in the banking financial services and insurance (BFSI), manufacturing and telecom verticals. It is usually divided into 27 segments, notable among them being accounting and finance, business intelligence, customer relationship management (CRM), enterprise resource planning (ERP), manufacturing and warehousing, security and supply chain management. In contrast to software products, production of customised software entails primarily variable (labour) cost and not fixed cost, majority of which is often borne by the client. Since variable cost is primarily incurred, producers of customised software do not tend to enjoy the economies of scale, though then tend to reap economies of scope through different kinds of service diversifications (Niosi et al., 2012). The provision of quality labour which is abundant in India and with it the incurrence of variable (labour) costs for production of customised software is one of prime reasons for India's specialization in services and not products.[4]

Another variant of software product is that software which is embedded in the product itself. It is called embedded software. A typical example would be the software embedded in a cell phone.

On the other hand, ITeS are those services that are rendered using software as a means of production and internet as a transporting medium. These services are labour-intensive primarily involving back office operations (Aranya, 2008) and are usually outsourced away from the user organization, often to a third party or in some cases a subsidiary of its own. These services are non-strategic in nature (Rajeev and Vani, 2010). Typical examples of ITeS would include BPO, call centre, and medical transcription, other ITeS like CAD-CAM, etc. (Coward, 2002; Cusumano, 2003; Eischen, 2004; Joshi and Mudigonda, 2008; Dongier and Sudan, 2009; Joshi, 2011).

The policy framework described in the previous section gives us an impression that since its inception, the IT-ITeS policies have given prime accord to the software development segment. Given the initial predominance of the software development firms, such emphasis was not unnatural till the 1990s. However, since the early 2000, the entry of ITeS firms in an unprecedented scale has altered the picture considerably. Today, like most other industries, the IT-ITeS industry comprises a heterogeneous group of firms. In addition to the differences in firm sizes and their respective market shares, there is heterogeneity among firms across various segments of the industry; segmentation in accordance with the products or services being offered.

In our study, we have considered IT software, IT services and embedded software under the ambit of software development, and services rendered by call centres, BPO, medical transcription and others as ITeS. This classification follows directly from Coward (2002) who identified significant differences between these two subgroups. For the purpose of our analysis, it would be worthwhile to highlight the differences in alignment with Coward. The major differences between the two sub-groups are as follows:

1 Workers in software development firms require in-depth knowledge of computer programming languages, networks, and software programmes. ITeS, on the other hand, demands only basic knowledge of IT. In the words of Coward (2002), "*employees need to know how to use computers, but not understand how they work*".

2 From educational standpoint, software development requires people with either computer science background or having advanced technical training. In contrast, for ITeS, only elementary computer training with proficiency in English is required.

3 Software development is much more communication intensive as compared to ITeS. Development of software involves "*an iterative process of building, checking, revising and testing*" (Coward, 2002). In case of ITeS, once the process is established, there is less need for project communications.

4 Though theoretically every industry can outsource its projects to software development firms, the software development firms themselves dominate in this category. The ITeS firms, on the other hand, posses a broader client base encompassing various other industries.

5 While cost savings is considered as one of the major reasons behind outsourcing of projects of both software development and ITeS, the quality of service often becomes more important in case of software development. Call centres, BPOs and medical transcription units also require quality customer interaction. However, due to the requirement of a more or less customised quality of service, cost considerations appear to be more important in case of outsourcing of ITeS.

6 With respect to quality certifications, while international certifications are vital in case of software development firms for they provide the necessary signal-value for attracting potential clients and thereby contracts (Arora and Asundi, 1999), only accuracy and speed are the major requirements of the ITeS firms.

Thus, though software development and ITeS share the commonality of relying on internet as a transport medium, the market structure, skill base and other strategies required to nurture the two segments are quite different.

## 4 Data description

To highlight the increasing heterogeneity of the IT-ITeS industry, we have concentrated on STP Kolkata. Registered as an Autonomous Society, STPs were established by Government of India (GOI) on 5th June 1991, with an objective of promoting exports of software and services. Conceptually, the STP scheme is similar to 100% Export Oriented Unit (EOU) scheme or the Export Processing Zones (EPZs) established by the Ministry

of Commerce. The scheme offers certain benefits to its member units like approval for single-window clearance, income tax holiday as per sections 10A/10B of the IT Act, 100% duty free imports of capital goods (CG), 100% excise duty relief on CG procured from the Domestic Tariff Area (DTA), full reimbursement of Central Sales Tax (CST), etc. The STPs were instrumental in enabling offshore development of software and services. Parthasarathi (2004, 2006) points out that the formation of STPs and consequent shift towards offshore provisioning of services manifested itself by changing the fortunes of the industry. Exports from STPI have grown from Rs. 200.5 billion in 2000– 01 to Rs. 2,072.6 billion in 2008–09, thereby registering a compounded annual growth rate (CAGR) of 34% during the said period.

Since its inception, STPI has set up quite a number of its centres or nodal offices in various parts of India. STP Kolkata is one such nodal wing and is administered by West Bengal Electronics Industry Development Corporation (WEBEL) under the powers delegated by STPI for implementing the scheme in the state of West Bengal. The IT-ITeS industry in West Bengal is concentrated mostly within the aegis of STP Kolkata.[5]

The required data for this study has been collected solely from the statutory reports submitted by the registered units in prescribed formats to STP Kolkata. These include annual performance report cum auditor's certificate, monthly and quarterly performance reports. The data set covers a period of 15 years, 1992–93 to 2006–07. Needless to say, all comparisons that are made in the paper are based on a particular data set and subject to its limitations.

A major part of our data has been collected from the performance details furnished by the member units in their auditor's certificate at the end of each financial year.[6] The auditor's certificate provides information like – the date of STP approval, the CG limit that is approved by the STP, the performance of the member units outlined in terms of the export earnings, the costs incurred by the units (that includes cost for import of CG, cost towards other foreign exchange outflow and cost for meeting the monthly salaries/wage bill of the employees) and the amount of investment. The employment figures, on the other hand, were extracted from the monthly performance reports.

## 5 Exploring the heterogeneity

### *5.1 Industry dynamics*

To explore the heterogeneity of the IT-ITeS industry one should ideally start with the evolution of the sector. The IT-ITeS industry that blossomed under the purview of STP Kolkata made its modest beginnings in 1992–93 with only a handful of firms (Table 1). Out of the eight software application firms that entered the industry, three were functional and only one exported. The first product development unit entered in 1996–97. The first of the two other ITeS units entered the industry in 1997–98. Thus, till 1998–99, the export basket consisted of software application, product development and other ITeS.

The year 1999–00 marked an important landmark in the evolution of the industry. This year witnessed an unprecedented entry of firms (161 to be exact). It needs to be mentioned in this connection that this large scale entry of firms in 1999–00 was triggered off by a notification circulated by GOI stating that firms registering on or before 31st

March, 2000 would enjoy income tax benefits. This can be realised from the fact that of the 161 firms that got registered, as many as 117 were non-operational.

However, the most notable feature of 1999–00 was that the year also marked the birth of the ITeS sector, with the entry of call centres, BPO and medical transcription units. The flow of the non-software development firms continued in subsequent years. As a result, while in 1999–00 around 70% of the firms in the industry were software application firms, their share declined steadily over the years. In 2006–07, the share of software application firms was around 47%. This, in turn, implies that though the industry continues to be dominated by software application, with the flow of time, other segments started to grow at a higher rate. As a result, the structure of the industry continues to become more and more complex and heterogeneous.

**Table 1** Status of entry and exit of firms

| *Year* | *Registration issued* | | *Operating units* | | *Exporting units by products/service lines* | | | | | | | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *DY* | *CU* | *DY* | *CU* | *SA* | *PD* | *ES* | *BPO* | *CC* | *MT* | *Other ITeS* | |
| 1992–93 | 8 | 8 | 3 | 3 | 1 | - | - | - | - | - | - | 1 |
| 1993–94 | 3 | 11 | 5 | 8 | 3 | - | - | - | - | - | - | 3 |
| 1994–95 | 3 | 14 | 6 | 11 | 6 | - | - | - | - | - | - | 6 |
| 1995–96 | 7 | 21 | 14 | 20 | 11 | - | - | - | - | - | - | 11 |
| 1996–97 | 5 | 26 | 10 | 24 | 16 | 1 | - | - | - | - | - | 17 |
| 1997–98 | 7 | 33 | 17 | 27 | 21 | 1 | - | - | - | - | 2 | 24 |
| 1998–99 | 8 | 41 | 13 | 30 | 25 | 2 | - | - | - | - | 2 | 29 |
| 1999–00 | 161 | 202 | 42 | 55 | 35 | 5 | 1 | 1 | 1 | 4 | 4 | 51 |
| 2000–01 | 39 | 241 | 39 | 81 | 45 | 5 | 2 | 2 | 1 | 7 | 6 | 68 |
| 2001–02 | 14 | 255 | 66 | 105 | 45 | 6 | 3 | 3 | 5 | 7 | 8 | 77 |
| 2002–03 | 25 | 280 | 48 | 114 | 57 | 10 | 3 | 5 | 5 | 9 | 10 | 99 |
| 2003–04 | 19 | 299 | 74 | 122 | 58 | 11 | 3 | 6 | 5 | 9 | 12 | 104 |
| 2004–05 | 26 | 325 | 70 | 144 | 62 | 12 | 3 | 10 | 11 | 10 | 15 | 123 |
| 2005–06 | 39 | 364 | 96 | 166 | 71 | 15 | 3 | 12 | 18 | 8 | 17 | 144 |
| 2006–07 | 37 | 401 | 92 | 188 | 79 | 16 | 3 | 17 | 21 | 8 | 23 | 167 |

Notes: DY: During the year
CU: Cumulative since inception
SA: Software Application
PD: Product Development
ES: Embedded Software
CC: Call Centre
MT: Medical Transcription
BPO: Business Process Outsourcing
Other ITeS: Other IT Enabled Services.

*Source:* STP Kolkata

**Table 2** Revenues of the industry (all figures in Rs. millions)

| *Year* | *Exports by products/service offerings* | | | | | | | | *Domestic sales* | *Total revenue* | *Share of exports* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *SA* | *PD* | *ES* | *BPO* | *CC* | *MT* | *Other ITeS* | *Total exports* | | | |
| 1992–93 | 10 | - | - | - | - | - | - | 10 | 0 | 10 | 100% |
| 1993–94 | 26 | - | - | - | - | - | - | 26 | 0.1 | 26.1 | 100% |
| 1994–95 | 59.7 | - | - | - | - | - | - | 59.7 | 0.7 | 60.4 | 99% |
| 1995–96 | 90.8 | - | - | - | - | - | - | 90.8 | 1.1 | 91.9 | 99% |
| 1996–97 | 219.6 | 0 | - | - | - | - | - | 219.6 | 6.3 | 225.9 | 97% |
| 1997–98 | 368.7 | 2.2 | - | - | - | - | 22 | 392.9 | 1.6 | 394.4 | 100% |
| 1998–99 | 839.3 | 49.8 | - | - | - | - | 48.1 | 937.3 | 11.1 | 948.4 | 99% |
| 1999–00 | 819.5 | 124.7 | 7.3 | 0.2 | 0 | 3 | 25.9 | 980.6 | 32.2 | 1,012.8 | 97% |
| 2000–01 | 3,313.5 | 216.5 | 73.9 | 15.9 | 2.5 | 9.8 | 89.8 | 3,722 | 174.7 | 3,896.7 | 96% |
| 2001–02 | 5,628.3 | 212.6 | 110.9 | 32.7 | 22.7 | 23.5 | 82.3 | 6,112.9 | 103.6 | 6,216.4 | 98% |
| 2002–03 | 7,417.7 | 353.2 | 67.1 | 53.4 | 155.7 | 48.1 | 189.9 | 8,285 | 330.3 | 8,615.3 | 96% |
| 2003–04 | 11,306.4 | 452.9 | 22.6 | 94.7 | 265.9 | 68.6 | 307.7 | 12,518.7 | 102.8 | 12,621.5 | 99% |
| 2004–05 | 15,851.5 | 329 | 43.7 | 108.4 | 519.1 | 111.9 | 448.1 | 17,411.6 | 165 | 17,576.6 | 99% |
| 2005–06 | 19,123 | 428 | 36.5 | 238.2 | 737.3 | 125.1 | 375.2 | 21,063.2 | 167.9 | 21,231.1 | 99% |
| 2006–07 | 28,315.4 | 722.1 | 53.6 | 1,201.7 | 1,270 | 153.3 | 813.7 | 32,529.7 | 212.7 | 32,742.3 | 99% |

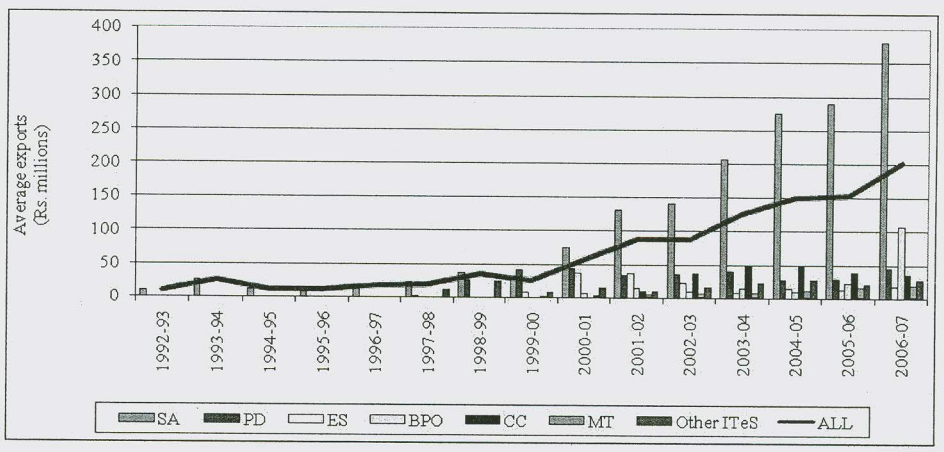
*Source:* STP Kolkata

### *5.2 Revenues of the industry*

The rather distinguishing feature of the IT-ITeS industry is its unprecedented export-orientation. Exports have accounted for almost 100% of the total earnings. This is no surprise considering the fact that the STP scheme is a 100% EOU scheme. Only after meeting certain export obligations, which has been revised by STP from time to time, can the units venture into sales in the DTA. It was found that domestic sales comprise primarily of software services. ITeS cater largely to the export market.

Looking at the trajectory of exports, we observe that the volume of exports have increased from a meagre Rs. 10 million in 1992–93 to over Rs. 32.5 billion in 2006–07 (Table 2). However, the growth rate of exports increased on an average since 1999–00 (Figure 1). The export basket has been dominated by software application since inception, given the fact that majority of the firms (and more importantly the bigger ones) are engaged in software application. However, it should also be noted that the average exports of ITeS units, especially that of call centres, BPO and other ITeS units seems to have picked up since 2002–03. Thus, it is not only in terms of numbers but also in terms of revenue earning capacity; the non-software development firms seem to gain increasing importance over time.

**Figure 1** Trajectory of exports (see online version for colours)




*Source:* STP Kolkata

### *5.3 Industry structure*

To explore the structure of the industry, we classified the firms in accordance with their annual turnover (Table 3). The table reveals that the IT-ITeS industry exhibits a pyramidal structure. Majority of the firms are either small or marginal with only a handful of big players.[7] Among the firms in the industry, only one firm had an annual turnover between Rs. 5 to 10 billion for three consecutive years, 2003–04 to 2005–06. Again only one firm crossed Rs. 10 billion barrier in 2006–07. In contrast, there a large number of firms with an annual turnover between Rs. 10 to 15 million. As a matter of fact, the industry also has quite a number of players whose annual turnover is less than even Rs. 1 million.

**Table 3** Structure of the IT-ITeS industry at STP Kolkata

| *Annual turnover (Rs.)* | *1992–93* | *1993–94* | *1994–95* | *1995–96* | *1996–97* | *1997–98* | *1998–99* | *1999–00* | *2000–01* | *2001–02* | *2002–03* | *2003–04* | *2004–05* | *2005–06* | *2006–07* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Greater than Rs. 10 billion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| Rs. 5 billion to 10 billion | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | - |
| Rs. 2 billion to 5 billion | - | - | - | - | - | - | - | - | - | 1 | 1 | - | 1 | 2 | 2 |
| Rs. 1 billion to 2 billion | - | - | - | - | - | - | - | - | 1 | - | - | 2 | - | 1 | 3 |
| Rs. 500 million to 1 billion | - | - | - | - | - | - | - | - | 1 | 3 | 2 | 2 | 3 | 1 | 2 |
| Rs. 300 million to 500 million | - | - | - | - | - | - | - | - | 2 | - | 2 | 2 | 1 | 2 | 2 |
| Rs. 200 million to 300 million | - | - | - | - | - | - | 1 | 1 | - | 3 | 2 | 2 | 3 | 3 | 7 |
| Rs. 150 million to 200 million | - | - | - | - | - | - | 1 | - | 2 | 1 | 1 | 3 | 6 | 4 | 5 |
| Rs. 100 million to 150 million | - | - | - | - | 1 | 1 | - | 2 | 3 | 1 | 5 | 2 | 3 | 5 | 10 |
| Rs. 50 million to 100 million | - | - | - | 1 | 1 | 2 | 3 | 2 | 8 | 6 | 9 | 10 | 5 | 15 | 16 |
| Rs. 10 million to 50 million | - | 1 | 1 | - | 1 | 6 | 9 | 13 | 17 | 19 | 15 | 28 | 42 | 46 | 48 |
| Rs. 5 million to 10 million | 1 | - | 1 | - | 1 | - | 6 | 5 | 9 | 11 | 14 | 14 | 14 | 15 | 22 |
| Rs. 1 million to 5 million | - | - | 1 | 3 | 4 | 9 | 4 | 6 | 16 | 17 | 32 | 22 | 29 | 32 | 36 |
| Less than Rs. 1 million | - | 2 | 3 | 7 | 9 | 6 | 5 | 22 | 9 | 15 | 16 | 16 | 15 | 17 | 13 |
| Total | 1 | 3 | 6 | 11 | 17 | 24 | 29 | 51 | 68 | 77 | 99 | 104 | 123 | 144 | 167 |

*Source:* STP Kolkata

The concentrated structure of the industry is aptly reflected by the Herfindahl-Hirschman Index (HHI) and five-firm concentration ratios ($C_5$).[8] The top-five players of the industry have accounted for over 70% of the industry revenues consistently since 2001–02 (Table 4).

Given the predominance of the software development firms that exhibit significant increasing returns, this type of concentration is a natural outcome in the industry. However, the most striking feature of the industry is that notwithstanding the entry of a number of firms in the non-software development segments, the extent of concentration has not decreased. This is primarily because the new entrants in BPOs, call centres and medical transcription segments are small firms.[9] It needs to be noted that while the

software development segment exhibits a pyramidal structure, the ITeS segment is by and large more competitive, characterised by prevalence of a number of smaller firms competing with each other to enhance their competitive standing in the international market.

**Table 4** Industry concentration

| *Year* | *Number of players* | *HHI* | $C_5$ |
|---|---|---|---|
| 1996–97 | 17 | 3,718.79 | 95.79 |
| 1997–98 | 24 | 1,441.71 | 74.31 |
| 1998–99 | 29 | 1,271.86 | 66.37 |
| 1999–00 | 51 | 1,011.31 | 59.88 |
| 2000–01 | 68 | 1,222.73 | 61.60 |
| 2001–02 | 77 | 1,653.55 | 70.96 |
| 2002–03 | 99 | 2,005.41 | 71.75 |
| 2003–04 | 104 | 2,326.09 | 74.20 |
| 2004–05 | 123 | 2,868.43 | 77.04 |
| 2005–06 | 144 | 1,815.28 | 76.18 |
| 2006–07 | 167 | 1,585.07 | 70.20 |

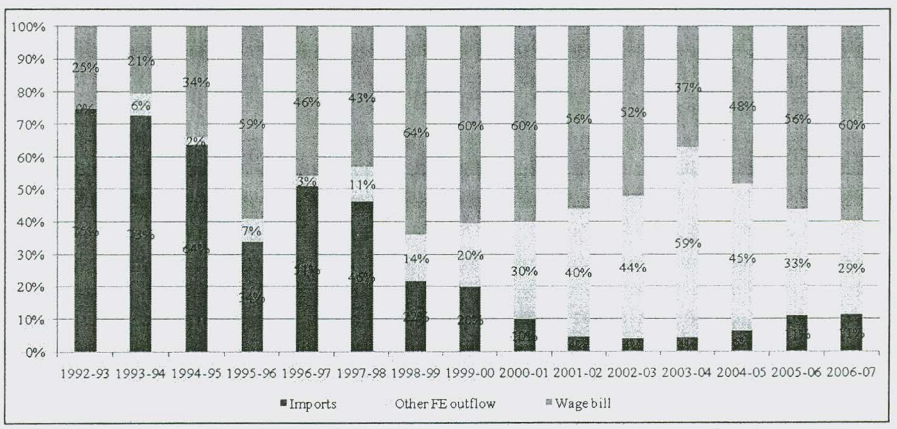
*Source:* STP Kolkata

## *5.4 Components of cost*

The auditor's certificate reveals the firms incur three types of costs, namely cost for import of CG, cost for other FE outflow (that includes costs like cost of imported spares and consumables, royalty, repartition of dividends and profits) and cost for meeting the monthly salaries (i.e., wage bill) of the employees.

The share of various costs in total cost is illustrated in Figure 2. It appears that over the years, the share of imports has progressively declined and its place has been taken over initially by the wage bill factor and later on by other FE outflow.

**Figure 2** Cost components (see online version for colours)

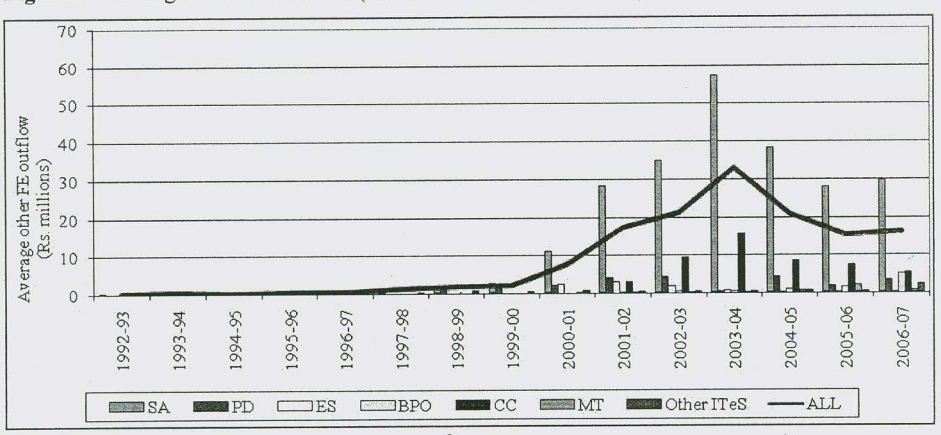



*Source:* STP Kolkata

The decline in the share of imports since inception is due to the fact that in the formative years firms go for huge imports towards establishment of their initial set-up which then declines significantly over the years as the firms put more emphasis on up-gradation and modification of their existing set-up, resulting in comparatively lower imports. Though entry of the non-software development firms gained momentum since 1999–00, this has not affected the share of imports much due to their relatively less reliance on imported CG. Moreover, due to the reduction in government duties on importable items, the prices of importable items have declined substantially over the years. Further, with the subsequent availability of the importable items in the domestic market in recent years, the firms continue to prefer procuring them from the DTA, resulting in lower share of imports in total cost.

Other FE outflow, on the other hand, has increased gradually over the years with the increase being more pronounced since 1999–00 (Figure 3). Though software application units always acquired the prominent position, foreign exchange outflow of call centres have started to increase significantly since 2001–02.

**Figure 3** Average other FE outflow (see online version for colours)



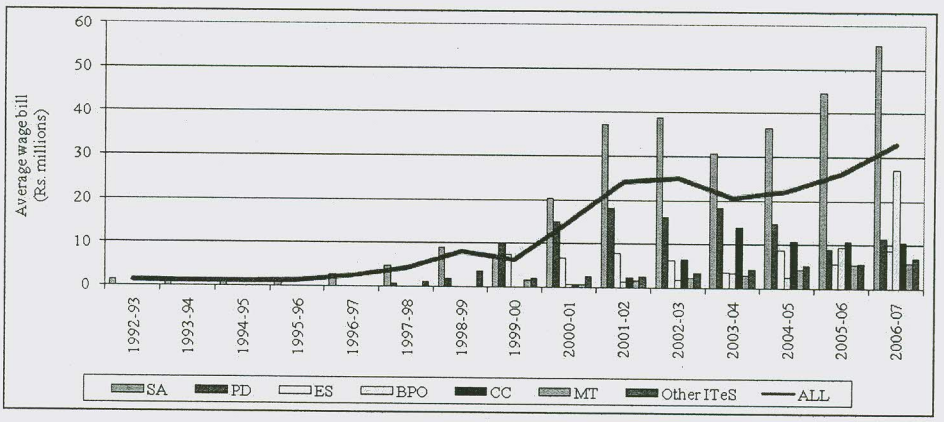

*Source:* STP Kolkata

It is not a mere coincidence that average other FE outflow and average exports have exhibited the same trend (Figures 1 and 3). As a matter of fact, a higher other FE outflow goes hand in hand with higher exports for it reflects increasing links of the firms with their clients in the West.

The average wage bill has increased significantly over the years with the entry of new firms and subsequent growth in output and employment (Figure 4). Higher wage bill may also be attributed to the increasing competition among the units to procure and retain efficient and skilled manpower for executing high-end services, resulting in upward revision of the wage bill factor. Predictably, average wage bill has been highest for software application, product development and embedded software units, which entail domain-specific technical knowledge and expertise. However, the figure also highlights that over the years wage bill of BPOs, call centres and medical transcription segments has also grown at a considerable extent. Given that, these segments require less technology-specific skills, this in turn indicates that rise in wage bill is on account of

substantial employment generation in these segments (this will be substantiated with data in course of our analysis).

**Figure 4** Average wage bill (see online version for colours)

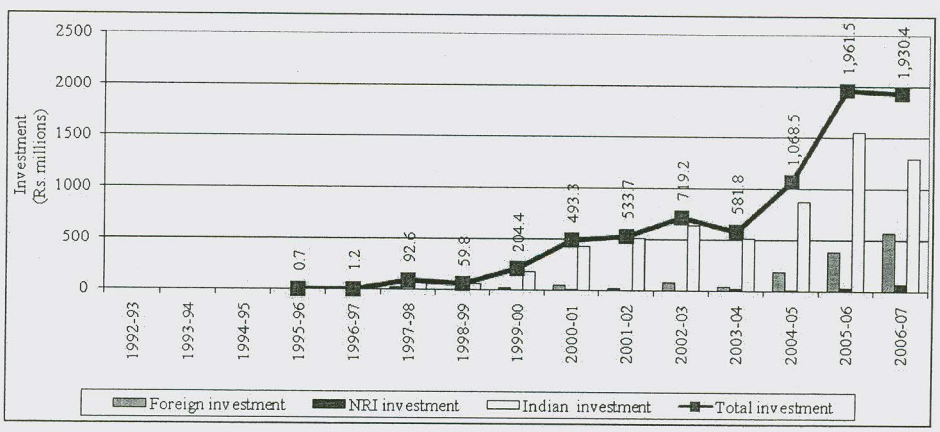



*Source:* STP Kolkata

## 5.5 *Investment scenario*

There are three sources of investment, namely foreign investment, NRI investment and Indian investment (Figure 5). The absence of investment figures till 1994–95 was due to the fact that firms did not report investment figures in their auditor's certificate. As a matter of fact, till 1996–97, investment figures were underreported. The industry has been dominated by Indian investment. Though there is a little bit of foreign investment, NRI investment has been virtually negligible. The investment, especially the Indian component, seems to have picked up since 1999–00 in alignment with the growth rate of exports.

**Figure 5** Sources of investment (see online version for colours)




*Source:* STP Kolkata

Segment wise break-up of investment reveals that since 2000–01 there has been significant increase in investment in the ITeS segments, though software application segment retained its leadership both in absolute and relative terms. The increase in investment in ITeS segments has been most prominent in call centres, followed by BPOs and medical transcription units.

**Table 5** Segment wise investment (all figures in Rs. millions)

| *Year* | *SA* | *PD* | *ES* | *BPO* | *CC* | *MT* | *Other ITeS* | *ALL* |
|---|---|---|---|---|---|---|---|---|
| 1992–93 | | | | | | | | 0.0 |
| 1993–94 | | | | | | | | 0.0 |
| 1994–95 | | | | | | | | 0.0 |
| 1995–96 | 0.7 | | | | | | 0.0 | 0.7 |
| 1996–97 | 1.2 | | | | | | 0.0 | 1.2 |
| 1997–98 | 85.2 | | | | | | 7.3 | 92.6 |
| 1998–99 | 59.8 | | | | | | 0.0 | 59.8 |
| 1999–00 | 74.0 | 10.3 | 0.0 | 0.0 | 0.0 | 39.9 | 80.3 | 204.4 |
| 2000–01 | 270.5 | 2.7 | 0.1 | 0.8 | 41.5 | 9.9 | 167.1 | 493.3 |
| 2001–02 | 461.0 | 4.8 | 23.3 | 0.0 | 24.2 | 6.3 | 14.0 | 533.7 |
| 2002–03 | 469.3 | 4.7 | 34.5 | 0.4 | 141.2 | 23.3 | 44.0 | 719.2 |
| 2003–04 | 500.7 | 15.8 | 0.0 | 1.6 | 18.3 | 6.6 | 31.0 | 581.8 |
| 2004–05 | 725.8 | 17.9 | 0.0 | 9.0 | 44.5 | 33.3 | 157.2 | 1,068.5 |
| 2005–06 | 1,364.8 | 117.6 | 0.3 | 26.9 | 80.8 | 10.5 | 65.0 | 1,961.5 |
| 2006–07 | 935.2 | 112.1 | 4.0 | 36.1 | 141.7 | 8.6 | 114.5 | 1,930.4 |

*Source:* STP Kolkata

### *5.6 Employment*

Labour or employment is the most crucial input for a technology-intensive industry like IT-ITeS. The employment in the industry has grown from 12 in 1992–93 to over 26,000 in 2006–07. It is no surprise that both in aggregative terms and average terms, employment has picked up since 1999–00 (Table 6, Figure 6), just the same year when the exports started to grow at a rapid pace (Table 2, Figure 1).

However, Table 6 also points out some major changes that are taking place in the industry. It is undeniable that the software application is by far the largest employment generating segment. Given the prominence of this sector both in terms of number of operating units and in the share of revenue generated, this is obviously not surprising. What is actually notable is that in terms of employment generation, over the period ITeS segments like BPOs and call centres are growing at a comparatively higher pace. The share of software application units in total employment generation, which was around 80% in 1999–00 continued to decline more or less steadily over the years. In 2006–07 its share was only about 64%.

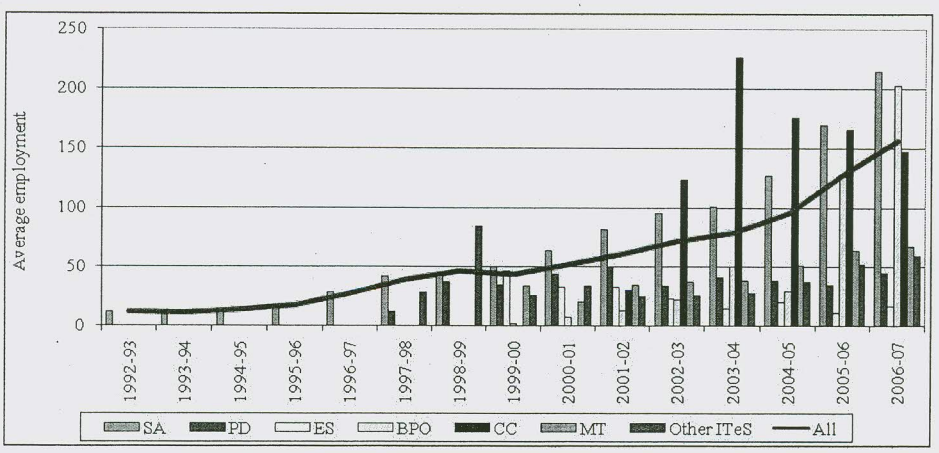
**Table 6** Employment

| *Year* | *SA* | *PD* | *ES* | *BPO* | *CC* | *MT* | *Other ITeS* | *ALL* |
|---|---|---|---|---|---|---|---|---|
| 1992–93 | 12 | - | - | - | - | - | - | 12 |
| 1993–94 | 32 | - | - | - | - | - | - | 32 |
| 1994–95 | 80 | - | - | - | - | - | - | 80 |
| 1995–96 | 187 | - | - | - | - | - | - | 187 |
| 1996–97 | 455 | 0 | - | - | - | - | - | 455 |
| 1997–98 | 792 | 12 | - | - | - | - | 56 | 860 |
| 1998–99 | 904 | 75 | - | - | - | - | 169 | 1,148 |
| 1999–00 | 1,750 | 173 | 46 | 2 | 0 | 135 | 100 | 2,206 |
| 2000–01 | 2,882 | 216 | 65 | 15 | 10 | 138 | 200 | 3,526 |
| 2001–02 | 3,684 | 299 | 98 | 38 | 149 | 240 | 193 | 4,701 |
| 2002–03 | 5,428 | 334 | 69 | 107 | 619 | 332 | 250 | 7,139 |
| 2003–04 | 5,841 | 453 | 43 | 300 | 902 | 344 | 325 | 8,208 |
| 2004–05 | 7,909 | 458 | 59 | 290 | 1,930 | 501 | 564 | 11,711 |
| 2005–06 | 12,103 | 512 | 33 | 1,511 | 2,981 | 508 | 883 | 18,531 |
| 2006–07 | 16,956 | 708 | 49 | 3,443 | 3,084 | 536 | 1,361 | 26,137 |

*Source:* STP Kolkata

The growth of the BPOs and call centres highlight that the job profile of the IT-ITeS sector is going to experience a change in near future. In general, jobs in the call centres and BPOs are not only labour intensive, but are less demanding in terms of skill. Given the underdeveloped state of overall education in India, this in turn, may open up a gateway for productive employment opportunities to a large section of the Indian workforce which lack the necessary skills required in areas of software application and product development.

**Figure 6** Average employment (see online version for colours)




*Source:* STP Kolkata

## 6 Concluding observations

The study attempted to highlight the inherent heterogeneity in the Indian IT-ITeS industry – a fact often overlooked by researchers and policymakers alike due to paucity of firm-level data. From the data obtained from STP Kolkata, the industry was classified into seven broad segments in accordance with the product or services being offered. From the analysis, it appears that all these are different spheres of activities altogether and the heterogeneity among them is such that it won't be an exaggeration to consider them as different industries altogether in conformity with Coward (2002). However, this distinction has never been taken into consideration by the government or regulatory bodies while devising policies or measures to promote the industry. As a matter of fact, policies undertaken to promote the sector had been unilaterally focussed towards software development, without any consideration of the intra-sectoral heterogeneity.

This unilateral focus towards fostering software development was obvious, given the fact that till the 1990s, the industry was characterised by the presence of the software development firms only. Expectedly, such an approach paid rich dividends catapulting India as arguably the most favoured outsourcing destination. However, the dynamics of the industry witnessed massive transformation since early 2000 as evident from our study on STP Kolkata characterised by increasing presence of firms in the ITeS segment. In addition to revenue generation, these firms have also generated substantial employment opportunities given the demand for low-skilled labour force that can be easily absorbed. This has important ramifications towards formulating policies in future for development of the IT sector in particular and the services sector in general.

In sharp contrast to the development experience of most of the hitherto developed economies, India has attained services led growth by bypassing agricultural and industrial development. According to World Bank (2004), "*India's developmental aspirations depend to a considerable extent on its ability to sustain the rapid growth of its service sector*". The IT-ITeS sector, being the backbone of the service industry thus has a crucial role to play in shaping the destiny of the country. No wonder, given the broad client base and cost arbitrage, the ITeS segment (if nurtured properly) has the potential to absorb a significant part of the low-skilled labour force which is abundant in India. Therefore, arranging specific policy initiatives focusing on the relatively low-skilled segments of the IT-ITeS industry are comparatively easier and ought to have immense impact in a country like India that faces high incidence of unemployment among relatively less technically-skilled workforce due to the miniscule rate of growth of the manufacturing sector. It is high time the policymakers take note of these inherent differences across various segments for the holistic development of the industry. This may also prove to be beneficial since the sustainability of the industry is highly susceptible to the vulnerabilities of the export market and emerging competition from various low-cost destinations.

This study, however, is not without its usual set of limitations. Firstly, by concentrating only on STP Kolkata, the paper has limited its applicability in suggesting a nation-wide policy. Secondly, due to unavailability of STP specific data we have not been able to move beyond 2006–07. Thirdly, the low level of industry practitioner response did not help the cause either and compelled us to focus only on the performance reports submitted by registered units at STP Kolkata. It therefore becomes the task of the future researchers to complement this study by focusing on the other regions as well. Meaningful conclusions can be drawn if firm-level data is augmented by more responses

from the industry participants. Otherwise, we would always remain in the dark in understanding the true dynamics of the industry that has been historically notorious for paucity of firm-level data.

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## Notes

1 IT-ITeS industry includes IT software, IT services and ITeS-BPO. In other words, it comprises the entire IT industry barring IT hardware (NASSCOM classification).

2 Since this data is not published but privately collected, it is unique.

3 During the period 1992–99, over 70% of the known multinationals came to India (Athreye, 2002). That included even IBM which had left India in protest against the FERA norms in 1978 (Parthasarathi, 2006).

4 Raymond (1999) argues that of all software development efforts, two-thirds are devoted to customised services and the rest in producing new software products.

5 In similar lines, IT-ITeS industry at an all India level is concentrated mostly within the aegis of STPI. In 2005–06, STP units accounted for 97% of India's IT earnings [Table 1, Parthasarathi (2010), p.249].

6 In this connection, it is important to state that the units that are non-operational do not submit their auditor's certificate for they do not have any performance. Thus the units that do not furnish their auditor's certificate are deemed to be non-operational.

7 The picture is no different at an all India level also.

8 The years 1992–93 to 1996–97 have been excluded due lower number players in computation of the indices.

9 During 2005–06, only 2 of the 55 firms in the ITeS segment as a whole had an annual turnover over Rs. 150 million.

## Annexure

*List of firms*

| | |
|---|---|
| 1 | A.B. Technologies |
| 2 | A1 Future Technologies |
| 3 | A4 Solutions Pvt. Ltd. |
| 4 | Acclaris Business Solutions Pvt. Ltd. |
| 5 | Acropolis Information Technology Pvt. Ltd. |
| 6 | Ada Software and Services Pvt. Ltd. |
| 7 | Adapt International Private Limited – Export Division |
| 8 | Adept Software Avenues Pvt. Ltd. |
| 9 | Adroit Infoservices Pvt. Ltd. |
| 10 | AIG Systems Solutions Pvt. Ltd. |
| 11 | Alumnus Software Limited |
| 12 | AMB Computer Integrated Engineering Pvt. Ltd. |
| 13 | American Reprographics Company India Private Limited |
| 14 | APT Software Avenues Pvt. Ltd. |
| 15 | ARB Software India Pvt. Ltd. |
| 16 | Aritra Computers Pvt. Ltd. |
| 17 | Artintel Systems Laboratories Pvt. Ltd. |
| 18 | ASPL Compuserve |
| 19 | Atlas Software Technologies (India) Pvt. Ltd. |
| 20 | Avant Garde Software Pvt. Ltd. |
| 21 | Avisere Technology (P) Ltd. |
| 22 | Azure Software Pvt. Ltd. |
| 23 | Babcock Borsig Softech Ltd. |
| 24 | Bayrise Technologies Pvt. Ltd. |
| 25 | Bhavani Metrics |
| 26 | BNKe Solutions Pvt. Ltd. |
| 27 | BOC Global Support Services Private Limited |
| 28 | BRI Technologies Pvt. Ltd. |
| 29 | Brick & Click Technologies Pvt. Ltd. |
| 30 | Bridgetree Research Services Pvt. Ltd. |
| 31 | Cadopia (India) Pvt. Ltd. |
| 32 | Cadworld Infosystems Pvt. Ltd. |
| 33 | CAE Solutions |
| 34 | Capgemini Consulting India Private Limited |
| 35 | Caribsoft Infosystems Private Limited |
| 36 | CA-TCG Software Pvt. Ltd. |
| 37 | CFI Technologies Private Limited |

*List of firms (continued)*

| | |
|---|---|
| 38 | Chutney Technologies India Pvt. Ltd. |
| 39 | Clickseva.Com |
| 40 | CMC Limited |
| 41 | Cogentech Management Consultants Pvt. Ltd. |
| 42 | Cognizant Technology Solutions India Pvt. Ltd. |
| 43 | Cognizant Technology Solutions India Pvt. Ltd. (Unit-Ii) |
| 44 | Cognizant Technology Solutions India Pvt. Ltd. (Unit-Iii) |
| 45 | Computech International Ltd. |
| 46 | Connectiva Systems India Pvt. Ltd. |
| 47 | Convergence Contact Centre Pvt. Ltd. |
| 48 | Databazaar India Pvt. Ltd. |
| 49 | Debono India Infotech Pvt. Ltd. |
| 50 | Delsoft (India) Pvt. Ltd. |
| 51 | Descon Soft Limited |
| 52 | Destiny Infotek Ltd. |
| 53 | Development Ark |
| 54 | Devita Engineering (India) Private Limited |
| 55 | Digital Avenues Limited |
| 56 | Digital Domain (India) Pvt. Ltd. |
| 57 | Digital Think (India) Pvt. Ltd. |
| 58 | Distributed Object Technologies Limited |
| 59 | DPS India Pvt. Ltd. |
| 60 | DPS Technologies India Pvt. Ltd. |
| 61 | DSQ Software Ltd. |
| 62 | Earthbase Technologies |
| 63 | Eastek Solutions Private Limited |
| 64 | E-Callserve Outsourcing Pvt. Ltd. |
| 65 | E Force India Pvt. Ltd. |
| 66 | Electra Design Automation Pvt. Ltd. |
| 67 | Elogix Software Pvt. Ltd. |
| 68 | Emend Technology Pvt. Ltd |
| 69 | ENG Software Pvt. Ltd. |
| 70 | Erevmax Technologies Pvt. Ltd. |
| 71 | Excellence Tech. (A Divn. Of Kariwala Industries Ltd) |
| 72 | Falta Software Pvt. Ltd. |
| 73 | Finovant Solutions Private Limited |
| 74 | Firstsource Solutions Limited |
| 75 | Fi-Tek Pvt. Ltd. |

*List of firms (continued)*

| | |
|---|---|
| 76 | Fortune Hi-Tech Centre Ltd. |
| 77 | Foster Wheeler India Private Limited (Export Division) |
| 78 | Gamut Infosystems Ltd. (Export Division) |
| 79 | GE Capital International Services |
| 80 | Genpact India |
| 81 | Global Associates |
| 82 | Global System Technologies India Pvt. Ltd. |
| 83 | Globsyn Technologies Limited |
| 84 | Gravity Infotech |
| 85 | Great Media Technologies Pvt. Ltd |
| 86 | Greenwave Technologies India Pvt. Ltd. |
| 87 | GSI logic Software Private Limited |
| 88 | HCL Technologies Ltd. |
| 89 | HCL Technologies Ltd. (Erp-Kolkata) |
| 90 | Heinen & Hopman Engineering (I) Pvt. Ltd. |
| 91 | HSBC Electronic Data Processing India Pvt. Ltd. |
| 92 | IBM Business Consulting Services Ltd. |
| 93 | IBM Daksh Business Process Services Pvt. Ltd. |
| 94 | IBM India Pvt. Ltd. |
| 95 | ICRA Techno Analytics Limited |
| 96 | Igration Technology Solutions Private Limited |
| 97 | Impex Infotech Limited |
| 98 | India InfoPower International Pvt. Ltd. |
| 99 | Indusnet Technologies |
| 100 | Infomax Technologies |
| 101 | Infosoft Global Pvt. Ltd. |
| 102 | Infovision Software Pvt. Ltd. |
| 103 | Insync Technologies Pvt. Ltd. |
| 104 | Integrated Research And Consultation Pvt. Ltd. |
| 105 | Interactive Outsourcing (P) Ltd. |
| 106 | Interra Information Technologies (I) Pvt. Ltd. (Unit-I) |
| 107 | Interra Information Technologies (I) Pvt. Ltd. (Unit-Ii) |
| 108 | Interra Systems (India) Pvt. Ltd. |
| 109 | Intrasoft Technologies Ltd. |
| 110 | Inuva Info Management Pvt. Ltd. |
| 111 | Inverto India Pvt. Ltd. |
| 112 | Ixia Technologies Pvt. Ltd. |
| 113 | Jay Shree Infotech Consultants |

*List of firms (continued)*

| | |
|---|---|
| 114 | Jaya Computers & Softwares (P) Ltd |
| 115 | Kanika Infotech Ltd. |
| 116 | Kreative Fingers Pvt. Ltd. |
| 117 | Kreeti Technologies |
| 118 | Krypton Infotech Ltd. |
| 119 | Last Peak BPO Pvt. Ltd. |
| 120 | Last Peak Data Pvt. Ltd. |
| 121 | Last Peak Solutions Pvt. Ltd. |
| 122 | LCC Infotech Ltd. |
| 123 | Lee & Nee Softwares (Exports) Ltd. |
| 124 | Lexmark International (India) Pvt. Ltd. (Software Division) |
| 125 | Limtex Infotech Ltd. |
| 126 | Logo Design Company |
| 127 | Logos Infotech |
| 128 | LSI Logic India Pvt. Ltd. |
| 129 | Manjushree Infotech |
| 130 | Matrix Technologies Pvt. Ltd. |
| 131 | Metalogic Systems Pvt. Ltd. |
| 132 | Mil Technologies Limited |
| 133 | Mindedge Solutions |
| 134 | Mindteck (India) Ltd. |
| 135 | Mohata Softwares Pvt. Ltd. |
| 136 | Myezconnect Pvt. Ltd. |
| 137 | Navigators Software Pvt. Ltd. |
| 138 | Net Always |
| 139 | Netguru Ltd. |
| 140 | Netwatch Online Pvt. Ltd. |
| 141 | Nexgen Technology Services Pvt. Ltd. |
| 142 | NGS Solutions Pvt. Ltd. |
| 143 | NIIT Technologies Ltd. |
| 144 | NIIT Technologies Ltd. (Unit-Ii) |
| 145 | Octagon Software Pvt. Ltd. |
| 146 | Ontrack Systems Ltd. |
| 147 | Opaque Solutions Pvt. Ltd. |
| 148 | Optimal Computing Pvt. Ltd. |
| 149 | Oxi-Zen Softech Private Limited |
| 150 | Papyrus Infotech Pvt. Ltd. |
| 151 | Pecon Software Limited |
| 152 | Pertech Computers Ltd. |

*List of firms (continued)*

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| 153 | Pinnacle Infotech Solutions |
| 154 | Pixel Infosys |
| 155 | Praxis Softek Solutions Pvt. Ltd. |
| 156 | Pursuit Software Development Pvt. Ltd. |
| 157 | R J Softwares |
| 158 | Rebaca Technologies Pvt. Ltd. |
| 159 | Regal Services |
| 160 | Relate Software Pvt. Ltd. |
| 161 | Re-Life Digital Solution Private Limited |
| 162 | S. Sanghi & Co |
| 163 | S.Karnani & Associates |
| 164 | Sarang Infotech & Software Solutions Pvt. Ltd. |
| 165 | SB3 Software Solutions Pvt. Ltd. |
| 166 | Search Engine Ranking System Consultants Pvt. Ltd. |
| 167 | Sema Software India Pvt. Ltd. |
| 168 | Seven Hills Information Pvt. Ltd. |
| 169 | Siemens Information Systems Ltd. |
| 170 | Sintho Coates & Laminates (India) Pvt. Ltd. |
| 171 | Skytech Solutions Pvt. Ltd. |
| 172 | Smart Call Center Solutions Pvt. Ltd. |
| 173 | Soffront Software Pvt. Ltd. |
| 174 | Steel Plus Ltd. |
| 175 | Stesalit Infotech Ltd. |
| 176 | Stride Technology Pvt. Ltd. |
| 177 | Sunny Technologies Pvt. Ltd. |
| 178 | Sunrise Worldwide Ltd. |
| 179 | Sys-Con Engineering |
| 180 | Sysmetric Pvt. Ltd. |
| 181 | Tata Consultancy Services Limited ( Victoria Park) |
| 182 | Tata Consultancy Services Limited (GDC) |
| 183 | Tata Consultancy Services Ltd. |
| 184 | Tata Interactive Systems |
| 185 | TCG Software Services Pvt. Ltd. |
| 186 | Tech Mahindra Limited |
| 187 | Techna Digital Services Pvt. Ltd. |
| 188 | Techna Infrastructure Pvt. Ltd. |
| 189 | Technico Overseas |
| 190 | Techsoft |

*List of firms (continued)*

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| 191 | Techsoft Pvt. Ltd. |
| 192 | Tekverity Software Pvt. Ltd. |
| 193 | Transfront Solutions |
| 194 | Transtek Solutions Pvt. Ltd |
| 195 | Trulogix Information Systems Pvt. Ltd. |
| 196 | UshaComm India Pvt. Ltd. |
| 197 | Valley Infosystems Pvt. Ltd. |
| 198 | Vishnu Solutions Pvt. Ltd. |
| 199 | Vision Comptech Integrators Ltd |
| 200 | Vision Comptech Ltd. |
| 201 | Web Development Company Ltd. |
| 202 | Web Spiders (India) Pvt. Ltd. |
| 203 | Webgrity |
| 204 | Wizard Enterprises Pvt. Ltd. |
| 205 | Worldware India |
| 206 | Xplore-Tech Services Private Limited, Siliguri Unit |
| 207 | Xplore-Tech Services Pvt. Ltd. |
| 208 | Xponse IT Services Pvt. Ltd. |
| 209 | Xponse Technologies Ltd |