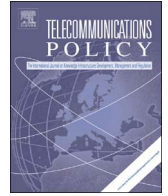




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The rise of IT services clusters in India: A case of growth by replication

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ABSTRACT

The Indian IT services sector has grown from small beginnings at the bottom of value creation to a major player in the global information and communications technology (ICT) industry. It commands a 55% share in the global market for IT services. India's IT sector value proposition in terms of low cost with large supply of high quality talent is compelling. As a result, India has become the premier choice not only for outsourcing IT services by the developed-world's multinational corporations (MNCs) but also for locating their own Global In-house Centers (GICs), which simultaneously compete and partner with local firms. This gave rise to six additional clusters beyond the earliest, largest and robust cluster, Bangalore. The paper provides a review of relevant literature; develops a conceptual framework for evaluation of clusters; and presents data and analysis with respect to relative size, growth, specialization, MNC presence and connectivity to local firms through expatriates and returning Indians, innovation; and discusses adequacy of ICT infrastructure for future growth. Although there are clear signs that the Indian IT sector has been moving towards a regime of providing high-end value added services, the sector's value proposition – lower cost combined with a large supply of high quality talent – remains the single most compelling reason for the rise and growth of multiple export clusters. Thus the sector's growth appears to be a case of growth by replication rather than innovation. The paper concludes that the Indian IT sector's value proposition in terms of lower cost combined with large supply of high quality talent remains the single most compelling reason for the rise and growth of multiple IT services export clusters. While the old adage, “people follow jobs” still holds for large part of the labor force, there is little doubt that the sprawling IT services clusters in India - with more to come from Tier II and Tier III cities – indicate, in fact, that “jobs follow talent.” Both local firms and the MNCs, through their GICs, are pushing the boundaries of location farther and farther to continue to leverage cost advantage and available pools of talent.

1. Introduction

Geographic concentration or agglomeration of certain industries, often referred to as clusters, has recently emerged as a key area of research in economics and business disciplines. While firms have obvious strategic interest in understanding the implications of clusters for locational decisions, it is of equal concern to policy makers who seek to understand how and why industrial clusters emerge and the implications of such agglomeration for building regional and national innovation systems for economic growth and

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development. Recent research suggests that agglomeration facilitates economic development, in the developed as well as the developing world by stimulating regional growth that benefits the nation as a whole. Indeed, analysis of clusters has become an integral part of the new trade theory. The source of comparative advantage is often local arising from a concentration of economic activity offering opportunities to improve productivity through greater access to specialized inputs and information; fostering producers of complementary products; and improving the rate and success of innovation (Marshall, 1920; Krugman, 1991; Ellison and Glaeser, 1997; Porter, 1998, for example). Key factors in the evolution of these clusters of economic activity include demand conditions, policies of local, state and national governments, transportation and communications infrastructure, institutions of higher learning, availability of skilled labor force and credit, entrepreneurial talent, the role of multinational companies (MNCs) and last but not least chance occurrences or historical accidents (such as the case of IBM setting up a large industrial research laboratory in Toronto, Canada after being denied by Cambridge, England). A detailed survey of relevant literature on clusters is provided in Section 3.

It is well established that the phenomenally rapid growth of information technology (IT) clusters over the past three decades has helped India become the world's leading exporter of IT services to the developed world in general and to the United States, in particular with important labor market implications for productivity, employment, wages, and innovation for India as well as the developed world. It is a topic of much discussion and heated debate among academics and policy makers alike in the US and other countries importing such services. A review of extant literature suggests that while there have been several case studies, focused mainly on Bangalore, few have attempted to throw light on the emergence of multiple horizontal IT services clusters - clusters separated by geography, state and local political boundaries, differences in infrastructure, educational institutions, availability of talent pool, complementary supporting industries and state and local government policies. And much of the research on IT clusters goes back to 2007 and earlier. Much has happened in the evolution of the nature, scope, and capabilities of Indian IT clusters since then, which raise a number of policy-related concerns and issues that provided the motivation for this paper. They include: the adequacy of ICT infrastructure to meet the current and future demand for IT services globally in the context of fourth Industrial revolution which, among other things, combines Internet of Things (IoT) and Internet of Services (IoS); the role of rapidly growing MNC led GICs – that compete and cooperate with the local firms - in the growth of more IT clusters in the country that go beyond being a supportive function; the role of IT clusters climbing up the value-chain through innovation to generate more and better jobs for the growing number of technical graduates in the country. Moreover, as Delgado, Porter, and Stern (2014) suggest, in the face of positive impact of clusters on regional development and industry performance, there is a growing need for cluster-based data for comparative analysis to aid policy makers and businesses alike. In addition, it is important to note at the outset that vast majority of theoretical and empirical literature on clusters has to do with *industrial clusters*. By contrast, this paper is about the growth of IT services clusters in India.

The focus of this paper is on information technology (IT) clusters—particularly the software segment—that have emerged in seven Indian cities/regions starting with Bangalore followed by the National Capital Region (NCR) comprising New Delhi and its surrounding areas in three different states, Mumbai, Pune, Hyderabad, Chennai, and Kolkata. Particular focus will be on Bangalore, the largest IT cluster within what one might refer to as super cluster of high-technology firms spanning several industries—IT hardware, aerospace, machine tools, bio technology, and pharmaceuticals—and leading educational institutions.

The rest of the paper is organized into five sections. Section 2 provides an overview of the Indian IT sector. In Section 3, we provide a survey of relevant literature and a conceptual framework to help understand the evolution of clusters. A brief profile of the seven clusters and a comparative analysis of their characteristics are provided in Section 4. Section 5 discusses the contribution of MNCs and Indian expatriates with connections to MNCs from US and other developed-countries to the development of Indian IT sector. Concluding remarks and implications of our analysis for the future of India's IT services sector are provided in Section 6.

1.1. Data and sources

For purposes of this paper, IT sector—unless otherwise specified—refers to services provided by firms under three categories: IT-enabled services (ITES), business process management (BPM), and engineering and research and development (ER & D). Major sources of data for this paper are annual reports of the National Association of Software and Services Companies (NASSCOM) and the Prowess financial data base maintained by the Center for Monitoring Indian Economy (CMIE). Company-level financial measures (sales and value-added per employee, for example) were calculated from relevant data contained in the financial statements of 76 companies for which we had consistent data from 2004–2005 to 2013–14.

2. Overview of the Indian IT services sector

A watershed event in the evolution of modern IT sector in India was a liberalized regime around the mid-1980 concerning electronic, computer, and telecom sectors. The new computer policy (NCP) under this regime allowed, among other things, import of computers meant for software development for export markets at a lower duty or no duty in certain cases, and collaborations with foreign equity participation in software development. A key element of the policy was to encourage software exports through satellite-based computers with overseas links (Sharma, 2015). Moreover, the definition of software was broadened to include consultancy services delivered by the Indian firms at the location of clients abroad spawning what has come to be labelled as “body shopping”. This work was of short duration involving lower-end jobs like coding and data conversion. The experience foreign MNCs gained working with Indian companies in body shopping combined with the availability of a large pool of low cost engineers who are fluent in English made India a very attractive destination for offshoring which became the next phase in the evolution of its IT

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