THE DEVELOPMENT OF THE SOFTWARE INDUSTRY IN POSTREFORM INDIA: COMPARATIVE REGIONAL EXPERIENCES IN TAMIL NADU, ANDHRA PRADESH, AND KERALA

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OVERVIEW

The Development of the Software Industry in Postreform India: Comparative Regional Experiences in Tamil Nadu, Andhra Pradesh, and Kerala is an illuminating attempt by Dr. Rajendra Kumar to develop a coherent analytical framework in order to document and evaluate the reasons behind three successful cases in which high-tech industries were promoted for development and economic growth. Targeted at scholars and policymakers, it is an in-depth look into the role that regional political, cultural and enabling policy environments play in high-technology-based economic development, focusing on the software industry and information technology-enabled services (ITES) in India. The conclusions and findings of the author are a significant contribution towards understanding the different strategies and options available to developing regions in supporting the growth of this type of industry and making them competitive globally.

As highlighted by Dr. Kumar, tech companies based in India have emerged as major software producers and exporters globally. He starts off by analysing India’s success in developing this industry, looking at what he calls “the many puzzling issues” that have not been examined previously. The first issue discussed is how an industrially backward economy could rise to the top of a hi-tech industry and become a global player so quickly. According to the author, this type of growth is considered impossible in contemporary economic development theories. The second issue discussed is how the state has played a significant role in pushing this developing economy forward within an overall neoliberal policy regime, a factor which he considers as needing further study. The third issue examined is the interesting and complicated story of India’s success, with its regional variations, in the growth of this industry.
A FUNCTIONAL APPROACH

The book comprises nine chapters, apart from the foreword and preface. The functional labelling of the chapters and sections is a useful method of organizing the book for easy reference and contributes to its highly technical nature. There is an appendix with some interesting comparative tables that contain relevant data on regions in India ranging from the 1990s to about 2005.

METHODOLOGY AND BACKGROUND ON THE CASE STUDIES

In chapter 1, the author begins by setting the tone that the Indian ICT industry has been able to sustain annual growth rates in the range of 30-40 per cent since the early 1990s, when the country embarked on ambitious economic reforms. The author goes on to show that, within the country, the growth of this industry has been highly uneven, with the southern and the western regions leading the way. He focuses in on this unevenness in order to conduct a comparative analysis on the role of regional policies and characteristics in the development of this industry. Since the southern region of India has progressed well, with such states as Karnataka and its Bangalore area spearheading the way, Dr. Kumar opts to focus on Tamil Nadu and Andhra Pradesh, as the rise of these states characterizes the development of the industry. These three states combined accounted for over 60 per cent of national software exports in 2005-2006. He uses Kerala, which he considers a late bloomer, as a shadow case to form a testable theory and back up his findings.

In chapter 2, the author examines the reasons why the current economic development schools of thought and existing literature do not adequately capture the nature and drivers of success in high-technology and knowledge-based industries. The author’s main approach to forming his theories is by comparing the differences in the methods and organization of production between traditional manufacturing-based industries in developing countries with the characteristics of production in knowledge-based industries, such as software development.

A point of interest is the author’s argument that “dominant-class” coalitions consisting of industrialists and professionals helped protect and advance specific interests, a case in point being Tamil Nadu and Andhra Pradesh. In contrast, the autonomous political character of Kerala, resulting from the struggles and accomplishments of marginalized castes and social groups, were partly responsible for its failure to implement policies similar to those of the other two states. This unexpected consequence illustrates the differentiations in the impact of policies and actions which could be seen as very positive in one way but stifling in another.
Chapter 3 outlines the various phases of the development of the software industry in India as a whole, and links these stages to milestone policy changes adopted at the country level. Packed with interesting historical information, it stresses the significance of the shift from a protectionist, hardware-production-oriented national policy to a pro-software export-oriented one. This involved fiscal, tax and import duties, related incentives and the setting of standards for technical education.

The first IT company started in the late 1960s, and the number of companies operating in India grew steadily. There is evidence of rapid growth after 1991. Software exports from India grew from $4 million in 1980 generated by 21 companies to $16,941,500 (excluding ITES) generated by 6,500 companies by 2005. The explosive growth depicted in the book, starting in 1991, is linked to economy-wide liberalization of industrial licensing, trade and foreign exchange policies as well as the relaxation of the rules on equity ownership by foreign firms. This not only increased the number of companies in operation but also improved the technological sophistication of the software development work done within India as more and more foreign companies entered the scene. Also of importance is the rise of the Tamil Nadu, Andhra Pradesh and Kerala regions during the mid-1990s, following in the footsteps of Karnataka.

The timeline for the central Government’s policy actions given in this chapter starts with the establishment of a separate Department of Electronics in 1970, followed by the establishment of the Electronics Commission, which were both intended to develop the hardware and software industry as well as formulate related policies. The author believes that the single most important national-level policy initiative taken to promote the software industry was the Software Technology Parks of India (STPI) scheme in 1988, which resulted in the establishment of software technology parks in major urban centres. These parks included ready-to-use infrastructure, such as satellite telecommunications facilities and single window clearance for projects, thereby lowering the start-up and operations costs of software companies.

THE IN-DEPTH TECHNICAL ANALYSIS

In chapter 4, the author uses multivariate time-series regression models to analyse various factors associated with the growth in software exports nationwide and in selected states. His analysis reveals that states with relatively better initial conditions, such as availability of skilled labour and good infrastructure, performed better in subsequently developing this industry. An interesting finding is that the literacy rate at the start of the reforms did not show a relationship with software
export growth. He goes on to state that, apart from the initial factors, the availability of skilled labour played a major part in the growth of the industry. He backs his argument with figures such as the high proportion of fresh engineering graduates in the states that excelled in terms of software exports.

THE THREE CASE STUDIES

Chapters 5, 6 and 7 contain a wealth of information on the development of the software industry in the three selected case study states of Tamil Nadu, Andhra Pradesh and Kerala. These chapters discuss the historic development of the software industry in each of the states and compares other factors, such as the structure and types of companies, policy initiatives taken by the state to develop the industry, which included regulatory and labour policy reforms, efforts to improve skilled labour and industry-specific infrastructure availability, promotion of linkages to global markets and expertise, and stimulation of local demand.

Chapter 5 looks at the growth in software and software services exports from Tamil Nadu, which grew at an annual rate close to 100 per cent from 1993 to 2005, starting with a 0.2 per cent share of the national total and ending with 13.4 per cent in 2005. Leading up to this rapid growth phase, the industry here was made up of companies started by Indian nationals, with the period between 1991 and 1995 showing evidence of the entry of multinational corporations (MNCs). The author emphasizes the critical role played by the different types of companies, including foreign-expatriate Indian companies, by comparing the number of such companies in Chennai with the rest of the country.

In Tamil Nadu, priority for this industry was only given in the mid-1990s marked by the setting up of the first STPI in 1995, 7 years after the programme was started. The first major state government policy initiative came in 1997 when the first IT policy was announced. However, software companies were already taking advantage of the available general incentives and tax subsidies for mega- and super-mega projects during the 1990s. An important effort of the state government worth mentioning is the inclusion of industry stakeholders in the decision-making process concerning the industry. While the first phase (1995-2000) focused on industry-specific infrastructure, skilled labour improvements and regulatory reforms, the second phase (2001-2006) was focused on attracting more large companies and creating linkages between local and multinational companies and international markets.

Similar to Tamil Nadu, Andhra Pradesh (discussed in chapter 6) also experienced growth in software and software services exports between 1993 and
2005 at an annual rate over 75 per cent holding a share of 11.9 per cent of the national total in 2005. The main difference between the two regions was that, by the mid-1990s, there were more MNCs in Andhra Pradesh. This was the result of a decision of the state government to attract large MNCs. Overall, the policy initiatives and direction taken by both regions are very similar and resulted in similar growth patterns.

The discussion on Kerala in chapter 7 highlights the differences in the strategies implemented and links them to exports growth in order to test the author’s theories and tactfully lead to the introduction of his “competitive flexibility” model. Unlike the previously discussed two regions, Kerala experienced only a 39 per cent annual growth rate in software and software services exports in the same period. Kerala was the last of the three states to adopt specific policy initiatives aimed at promoting this industry; incentives for investment and tax concessions for the industry were only introduced in 1998.

Fascinatingly, a STPI called Technopark (endowed with excellent facilities) was established in Kerala in early 1990s. However, though the infrastructure was conducive to the growth of this industry, the state did not attract enough companies until the end of the 1990s. According to the author, this was mainly due to the perception that labour in the state was militant and the government was hostile towards capitalists. Kerala was seen as being a hotbed for trade unions and was ruled by a leftist coalition from 1996 to 2001. The second phase (2001-2006), where there was a noticeable jump in exports after 2002, started off with a change of government in the state, which announced a new IT policy in 2001. This policy directly addressed the concerns of private companies in regard to labour issues. Subsequently, the state focused on attracting more companies and expatriate professionals to invest in the region and improving linkages with international markets.

In chapter 8, Dr. Kumar further looks at the role of the state in each of three regions and examines the various reasons for the success of Tamil Nadu and Andhra Pradesh, while using Kerala to showcase deterrents to growth.

**THE COMPETITIVE FLEXIBILITY MODEL**

Dr. Kumar's' new “competitive flexibility” model, presented in chapter 9, tries to capture the essential elements of strategies which give credibility to the hypothesis that increasing globalization presents tremendous opportunities for developing regions to become globally competitive in a hi-tech field.
This chapter, as with the proceeding chapters, once again summarizes and compares the different factors that influenced software export growth in the three regions and then goes on to discuss the pitfalls of existing literary paradigms in explaining this growth, in order to build a stronger argument for his new model. One of his main points to counter common literary models which are built around innovation economics is that the state did not play a significant role in providing specialized R&D or finance to the industry. The author’s final point is that regional strategies are still relevant even in modern knowledge-based economies, where regional and national boundaries have become increasingly irrelevant; appropriate development strategies, as discussed in the book, attract companies to take advantage of local resources and capacities and enable them to link up to international networks of production and innovation.

CONCLUSION

Dr. Kumar explains the success of the selected regions in India in terms of four critical factors: availability of adequate skilled labour and specialized infrastructure, pro-employer labour and policy reforms, ethnic linkages of immigrant professionals abroad who returned to establish firms in their native states, and their existing technological capabilities at the beginning of reforms. He believes that the most important strategy adopted by the successful states was to provide specialized factors of production (skilled labour and infrastructure) for the industry.

The author is clinical in his approach and focuses only on the situation in India in order to add depth to his research and findings. He correctly points out that, even in countries such as India, where there is visible evidence of success in software and ITES exports, there is a serious lack of research on how the different strategies adopted by the subnational regions influenced the specific development path of the industry in the respective regions. This is probably the strongest argument for the significance of this book, while the rich compilation of historical, factual and analytical information should encourage all interested practitioners, policymakers and even laymen to have a copy of this book.

Using time-series regression modelling, the author identified some key conditions that had positive or negative relationships with the growth of the software and ITES industry in India. This valuable and highly technical analysis is well worth reading in order to assist in unravelling the complex problems encountered in developing economic growth strategies.

As an added perspective, however, the author could have given some comparisons to global figures in terms of software exports, engineering graduates,
and other factors which could have given the reader a better understanding of the industry as a whole and highlighted India's position within it. This limitation also resonates in his discussion of the national level policies which shaped the growth in software exports in India – comparisons of similar or different approaches by other countries would have fulfilled the readers' urgent desire to compare development strategies in a global context.

It is sensible to note that, in attempting to promote his competitive flexibility model, the authors' focus on criticizing contemporary paradigms and models gives the reader a slightly ambiguous view of real life development options. He refers merely to the models in the literature that generalize traditional industries into one group which, for example, calls for vertical and horizontal integration rather than vertical specialization as one element of the success strategies. A case in point is the author's discussion of Michael Porters' development framework, where he does not consider the similarities of Porters' model in action in real world situations, to his own competitive flexibility model. For example, in the case of ceramics manufacturers, vertical specialization could be seen as a way to promote SMEs by outsourcing decal application and ornate painting work, which promotes collaboration in order to improve competitiveness. This could lead the reader to question whether the competitive flexibility model is a “new” theoretical framework as claimed by the author or an amalgam of existing paradigms. Nevertheless, awareness of this would urge the astute policymaker to consider applying the competitive flexibility model on other traditional industries in late-developing countries.

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* The views expressed in this review are those of the reviewer and do not necessarily reflect those of the United Nations.