

Annual Report

2013-14

Report of projects and papers completed, papers published, and external academic and policy advice given during the year

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1. Research papers completed

1.1: Successive change in Industrial Leadership, Emergence of India as the current world leader in Computer and Information Services

Abstract: The paper analyses the changing leadership in Computer and Information Services (CIS). Leadership is measured in terms of export shares. The leadership appears to have changed from United States of America, United Kingdom and Germany to Ireland and subsequently to India. India has been trying to maintain her leadership through improvements in technological capability and in that process has also become a base for MNCs to set up operations. These MNCs have been increasing their innovative activities in India as revealed through increased patenting and domestic Indian enterprises have followed although very slowly in improving their technological capability. Two conclusions can be drawn. Leadership in CIS is basically a function of the availability of highly trained software engineers. But the sustainability of leadership depends whether the industry is domestically or foreign owned.

Publication status: Working Paper no: 453 Centre for Development Studies

1.2: Entrepreneurship and local technological capacity in the East Asian natural resource-based production network, Case of India's Rubber industry

Abstract: India is unique among the Natural Rubber (NR) producing nations in the world. She has both a producing and consuming sector reinforcing the growth and innovative activities in each other. The paper undertakes a detailed survey of the diffusion of new technologies and the generation of innovations in both the NR producing and consuming sector and the extent to which their relative sectoral systems of innovation (SSI) has contributed to the production of innovations in the two sub sectors of India's rubber economy. In the case of NR, a public research institute

represents the core of the SSI while in the case of the automotive tyre industry it is led by three domestic tyre firms.

Publication status: under consideration by an international refereed journal

2. On going research papers

2.1 Industrial investments in Kerala, Analysis of its trends, constraints and challenges

Abstract: Industrial investments to Kerala's industrial sector have been very meager. In fact the situation is so acute since 2010 that the state has attracted virtually zero investments in the medium and large sectors since that year. Our analysis shows that four constraints are in play, which has its effect in dampening the flow of investments. These are land, labour, environmental consciousness of the civil society and the role of the bureaucracy. Although the state has an explicit industrial policy, the policy does not appear to take cognizance of these constraints in a tangible manner. Given the existence of these constraints and given the fact that the political will to lessen their negative impact is found wanting, the most practical option for the state is focus on industries in the services sector where the effect of these constraints are limited. The three sectors where such investments can flourish are Computer and Information services, hotels and tourism and retail trade. In fact the state is indeed focusing on the former two. In the case of the computer software industry, considerable improvement in the provision of physical infrastructure by adopting a hub and spoke model of investments to the sector has shown some considerable increases. Tourism and hotel is yet to reach its potential limit and in retail trade political compulsions have outweighed economic ones. Given the level of investments that can be expected in the future, the state's youth will have to continue migrating to other parts of the country and indeed abroad for gainful employment. For the state to grow through the manufacturing route will remain a distant dream.

(Abstract reported earlier, but the paper is completed on June 17, 2014)

2.2: Fostering entrepreneurial activity in high technology industries, Cases of medical devices industry in India (jointly with Franco Malerba, Bocconi University, Milan, Italy and Pamela Adams, Franklin University, Lugano, Switzerland)

Abstract: The extent of entrepreneurship in India increased significantly since the onset of economic liberalization that was initiated since 1991. There is statistical evidence to show that the number of new firms formed since 1991 is considerably higher than those formed earlier. Most of these new firms have come up in either high technology services or in manufacturing industries such as biopharmaceuticals and automotive industries. Increased market opportunities have been cited as the main reason for this emergence of high technology entrepreneurship. But this is largely based on the experience of Computer and Information Technology Services industry. Evidences of entrepreneurship in manufacturing industries are limited. This is because of the higher barriers to

entry into manufacturing and the negative effects of poor physical infrastructure (especially roads and electricity) affects manufacturing more than services. Among the barriers to entry, access to state-of-the art technology is an important constraint. The market for disembodied technology in the form of know-how, blue prints, designs etc. have become much more imperfect now. This is even more severe in the case of high technology industries where know-how is usually closely held by a few MNCs and the recent changes in the IPR regime has made reverse engineering almost impossible and run the risk of costly patent litigation. In the context, the proposed study of the evolution of high technology entrepreneurship in an important manufacturing industry is high relevant. The focus on fostering high technology industries in a developing country is sometimes frowned upon.

The size of India's medical devices industry is variously estimated to be around US\$ 3 billion. But the industry is to be growing at an average annual rate of 15 per cent-one of the highest for the industry in the world. There has been increase in the disease burden in India-incidence of both communicable and non-communicable diseases have shot up. India has also one of the most privatised medical expenditure systems in the world- over 65 per cent of the health expenditures are privately financed. In fact at the specific individual level almost 90 per cent of it is out of pocket. Health insurance system, although growing, covers only a small fraction of the total population. While India's innovation in pharmaceuticals has reduced the cost of drugs dramatically, most modern diseases such as cardio vascular, diabetes requires the use of medical devices both in diagnosis and in the treatment. The medical device industry in India is dominated by MNCs. But the cost of these devices is too high for the people to afford them. Hence there is an urgent need to reduce the cost of these devices so that the technology can be diffused. MNCs such as GE have had some successes in developing very cost effective medical devices. However these remain rare. In this context the Stanford-India bio design project was born. Initiated in 2007, within a few years, the programme have had a great success in terms of creating a number of new entrepreneurs who have come out with innovative medical devices. Innovation here is significant reductions in the cost of production of these equipments without de featuring them.

High technology products become more relevant in developing countries such as India when unmet demand for crucial medical technologies are developed using low cost solutions. In other words technological solutions become highly useful when it satisfies two conditions:

- Technologies are developed for satisfying unmet demand for such technologies; and
- Such technologies are affordable to all sections of the population

This is precisely what the Stanford India Biodesign Project (SIBP) (Brinton et. al, 2013) project has achieved in its seven-year history. Of the various medical devices ventures developed by SIBP, the following five stand out. We propose to do an in depth examination of these five start ups as they are an excellent example of high technology entrepreneurship is fostered which meets the above two conditions.

2.3: Rise to market leadership, Cases from India's Automotive and Pharmaceutical Industries (Abstract reported earlier in 2012-13)

3. Publications during 2013-14

Journal Articles

- Mani, Sunil (2013), 'Outward foreign direct investment from India and knowledge flows, the case of three automotive firms, Asian Journal of Technology and Innovation, Volume 21, Special Issue 1, , pp. 25-38.
- Mani, Sunil (2013) 'Late industrial revolution in India, Democratisation of entrepreneurship' (Review of the book, Sumit K Majumdar, India's late late industrial revolution, New Delhi: Cambridge University Press, Economic and Political Weekly, Vol. 48, pp. 25-28.
- Mani, Sunil and Anant Kamath (2014), ' Evidence-based policy making, What can we learn from India's R&D Statistics? ', Economic and Political Weekly, Vol 49, No: 10, pp. 13-16.

Chapters in Books

- Mani, Sunil (2013) 'India: in Kahn Michael, Luiz Martins de Melo, Marcelo G. Pessoa de Matos Financing Innovation, BRICS National Systems of Innovation , Delhi: Routledge India – 2013, pp.134-162.
- Mani, Sunil (2014), 'National governments and the promotion of innovations', in Grosclaude, Jean-Yves, Rajendra Pachauri, Laurence Tubiana, Damien Demailly, Raphael Jozan and Sanjivi Sundar (eds), Innovation for Sustainable Development, New Delhi: TERI Press, pp. 257-262.

Other Publications

Mani, Sunil (2012), 'Guide to data on Foreign Direct Investments to India', *International Journal of Development and Social Research*, Vol, 1, Issue No: II, pp. 55- 66.

Mani, Sunil (2014), 'TRIPS compliance of India's patent regime', *Mathrubhumi Yearbook Plus 2014*, pp.256-272

Working Paper

Mani, Sunil (2013), 'Changing Leadership in Computer and Information Services, Emergence of India as the Current World Leader in Computer and Information Services', WP 453

4. Seminars/Conferences/Workshops attended(2013-14)

Seminars presented at CDS

Gave an open seminar “Changing Leadership in IT services, Emergence of India as a world leader in Computer and Information Technology Services’ at the Centre for Development Studies, August 23, 2013-10-24

Did a book review of “India’s late, late industrial revolution, Democratizing entrepreneurship, by Sumit Majumdar”, September 10, 2013’

Seminar papers presented outside CDS

Gave a lecture on “Emerging strategies of Indian MNCs, Cases from India’s Automotive Industry” to a group of students and faculty from Saint Mary’s University of California, T A Pai Management Institute, Bangalore, July 10, 2013

- Presented paper on Entrepreneurship and Local Technological Capacity in the East Asian Natural Resource-Based Production Network: Case of India’s Rubber Industry in the workshop organized by IDE-JETRO, Bangkok, Thailand, October 7, 2013 .
- Was a Visiting Research Professor (Long Term) at Bocconi University, Milan, Italy, during November 4 through December 3, 2013. During the time he taught a course on “Fundamentals of Innovation and Industrial Change” jointly with Professor Franco Malerba.
- Presented a paper on “Changing leadership in computer and information services: The emergence of India as the current world leader in computer and information services’ Bocconi University, Milan, Italy, November 27, 2013

4. Seminars/Conferences/Workshops attended(2013-14)

- Participated in the Schumpeter workshop at Columbia University, New York, USA , December 5 and 6, 2013
- Presented a paper on Changing leadership in computer and information services: The emergence of India as the current world leader in computer and information services, Joint UNU-MERIT/School of Governance, University of Maastricht, The Netherlands, December 17, 2013,
- Was member of the examination committees of two doctoral dissertations viva voce at University of Maastricht, The Netherlands, December 18, 2013
- Presented a paper titled, “Policy spree or policy paralysis, An evaluation of India’s efforts at encouraging firm-level innovative activities’, at the national conference on “India’s industrialization: how to overcome the stagnation”, Institute for Studies in Industrial Development (ISID), New Delhi, December 20-21, 2013.

Presented the keynote speech ‘What do we know about FDI inflows to India ?’ at the UGC Sponsored National Conference on Foreign Direct Investment in India, Opportunities and Challenges, St Peter’s College, Kolenchery, January 30, 2014

Presented a paper on National governments and the promotion of innovations’ at the panel, Panel discussion, ‘How to steer the Indian Innovation System towards sustainability?’”, Delhi Sustainable Development Summit (DSDS), New Delhi, February 7, 2014

Presented a paper on ‘Entrepreneurship and Local Technological Capacity in the East Asian Natural Resource-Based Production Network, Case of India’s Rubber Industry’, IDE-JETRO Workshop, Bangkok, Thailand, February 15, 2014.

Was Visiting Professor at University of Toulouse Le Mirail. Presented a set of 5 lectures to Masters Students of Structure and Models of International Economy at University of Toulouse Le Mirail, Toulouse, France, March 20-28, 2014

4. Seminars/Conferences/Workshops attended(2013-14)

- Presented a seminar on 'Successive change in Industrial Leadership Emergence of India as the current world leader in Computer and Information Services', Toulouse Business School, Toulouse, France March 28, 2014.

5. External involvement in academic and policy Advice

Visiting Research Professor, Bocconi University, Milan, Italy (October-December, 2013)

Visiting Professor, University of Toulouse Le Mirail, Toulouse, France (March 2014)

Member, Editorial Board of Research Policy (Elsevier), International Journal of Technology and Globalization (Inderscience), International Journal of Technological Learning, Innovation and Development (Indescience), International Journal of Development and Social Research (Xavier Institute of Management)

External referee to: Research Policy, International Journal of Technological Learning Innovation and Development, Journal of Institutional Economics, Economic and Political Weekly, Journal of Higher Education.

External Examiner to two doctoral dissertations at University of Maastricht, The Netherlands.

6. Personnel Associated with the Unit

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