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## ***INTRODUCTION***

Forum for Global Knowledge Sharing (Knowledge Forum) is a specialised, interdisciplinary global forum. It deals with science, technology and economy interface. It aims at providing a platform for scholars belonging to different institutions, universities, countries and disciplines to interact, exchange their research findings and undertake joint research studies. It is designed for persons who have been contributing to R&D and publishing their research findings in professional journals. Its registered office is housed at the Institute for Human Development (IHD), New Delhi. However, its members and office bearers are from various institutions and countries (see the list of Governing Council Members) and function from their respective institution. Knowledge Forum was registered on August 25, 2005. We regularly hold annual conferences where the members present their research papers, share research findings with other members and interact. Knowledge Forum annual international conferences have been well attended and the papers have been of a high quality.

At present there is no inter-disciplinary forum for persons belonging to different disciplines like business schools, economics, basic sciences and technology to interact, collaborate and share their knowledge on the problems involved in technology creation and transfer, and other issues relating to global business. It was felt that in the current era of globalisation and fast technological change the creation of such a forum is vital.

Economists have been working on themes relating to technology creation and transfer without having an in-depth knowledge of science and technology. Likewise technologists have also been working on these themes without much or any knowledge of their economic viability. Therefore, some of us felt the vital need for a forum where technologists and social scientists could meet and interact. The membership to the Forum is open to all scholars who have been publishing in refereed professional journals.

**Corporate Members:** Global Development Network; The Hindu, The Kasturi & Sons Limited; Sir Dorabji Tata Trust; and EID Parry India Ltd, Murugappa Group.

## ***RESEARCH PAPERS***

The most important part of our website is the folder on “***Research Papers***”. All the registered members are allowed to submit their research papers. The submitted papers are refereed (peer reviewed) and the accepted papers are uploaded on the website. Placing the paper in our website does not prevent the authors from publishing it in any journal. These are considered similar to working papers and not as publications. We have now about 250 research papers in the website. eSocialSciences <http://www.esocialsciences.org> has also been giving wide publicity to our papers and programmes. In addition to research papers we also have folders on conference papers where presentations by non-members are also placed and one on Commentaries wherein members share important developments in science, technology,

economy and research methodology. We also have a folder on **Books** where our publications are listed with abstracts.

## **GOVERNING COUNCIL**

### ***President***

- Professor S. R. Hashim, former Chairman, Union Public Service Commission and former Member Secretary, Planning Commission

### ***Vice Presidents***

- Professor Stanley Nollen, McDonough School of Business, Georgetown University, Washington DC
- Professor Y. S. Rajan, Dr. Vikram Sarabhai Distinguished Professor, ISRO

### ***Treasurer***

- Professor K. Narayanan, Department of Humanities and Social Sciences, IIT Bombay

### ***Secretary/Hon. Director***

- Professor N. S. Siddharthan, Hon. Professor, Madras School of Economics, Chennai

### ***Members***

- Professor Y.K. Alagh, Chancellor, Central University of Gujarat.
- Professor Filip De Beule, KU Leuven University, Belgium
- Professor Bishwanath Goldar, Institute of Economic Growth and JNU, Delhi
- Professor Ashok Jain, Former Director NISTAD
- Professor K. L. Krishna, former Director, Delhi School of Economics
- Dr. Kaushalesh Lal, Society for Development Studies, Delhi and MERIT, The Netherlands
- Professor B. L. Pandit, Delhi School of Economics
- Professor Bino Paul, Tata Institute of Social Sciences, Mumbai
- Dr. Padma Prakash, eSocialSciences
- Professor Alakh N. Sharma, Director, Institute for Human Development, New Delhi

**Note:** Professor P. V. Indiresan was the founder President and remained President till October 2008. During the General Body Meeting (October 17, 2008), Professor Indiresan expressed his desire to be relieved from the post of the President. Consequently the Governing Council elected Professor S R Hashim President.

## ***MEMBERSHIP***

Membership of KNOWLEDGE FORUM is open to any individual with a research publication record in professional forums or holder of patents and who is in agreement with the objectives of KNOWLEDGE FORUM and who is prepared to work for their furtherance.

In addition there is also a provision for *Corporate Membership* and corporate institutions (including registered bodies and trusts) can become members and nominate their executives to take part in the activities of Knowledge Forum.

### **Membership Fee:**

- Individual Members, lifetime fee of rupees one thousand (INR1000)
- International Members, lifetime fee of US dollars one hundred (\$100)
- Indian Corporate Members, onetime fee of rupees hundred thousand (INR100,000.00). International Corporate Members, onetime fee of US dollars ten thousand (\$10,000.00)
- To become a member visit our website, < <http://fgks.in> > login and register
- Contact Address: Professor N. S. Siddharthan, [fgksindia@gmail.com](mailto:fgksindia@gmail.com)

**CONFERENCES/SEMINARS HELD**

We have been regularly holding our annual conferences. The participation rates in the conferences have been high.

<b>Dates</b>	<b>Hosts</b>	<b>Themes</b>	<b>Outcome/Publications</b>
August 11, 2018	MSE Chennai	<i>Technology and Development</i>	
February 24, 2018	Centre for Policy Studies, IIT Bombay	<i>FDI: Issues and Policy</i>	Policy Brief
November 10-12, 2017	NCDS Bhubaneswar	<i>Changing Paradigms in Technology, Trade and Development</i>	
December 3-5, 2016	IIT Madras	<i>Globalisation of Technology and Development</i>	Book by Springer
March 18, 2016	IIT Bombay	<i>Creation and Diffusion of Technology</i>	Book by Springer
November 27-28, 2015	NIAS Bangalore	<i>Technology, Growth and Sustainability</i>	Different Professional Journals
March 7, 2015	TISS Mumbai	<i>Harnessing Technology for Challenging Inequality</i>	Book by Springer
October, 27-29, 2014	NIAS Bangalore	<i>Technology: Corporate and Social Dimensions</i>	Book by Springer and some papers in <i>Journal of Industrial Statistics</i>
October 25-27, 2013	IIT Bombay	<i>Emerging Technologies and Development</i>	Book by Springer
November 30 - 2, December, 2012	Symbiosis, Pune	<i>Technology Intensity and Global Competitiveness</i>	Special issue of <i>Innovation and Development</i> , Routledge
November 18-20, 2011	Goa University	<i>Agglomeration, Technology Clusters and Networks</i>	Special issue of <i>Science, Technology and Society</i> , Sage
July 15-16, 2011	Institute of Mathematical Sciences, Chennai	<i>Academic Ethics</i>	Report in <i>Current Science</i>
November 11-12, 2010	IIT Bombay	<i>Human Capital and Development</i>	Book by Springer and some papers in <i>Contributions to Indian Social Science</i>

Contd...

<b>Dates</b>	<b>Hosts</b>	<b>Themes</b>	<b>Outcome/Publications</b>
March 19 - 21, 2010	MSE, Chennai	<i>Frontier Issues in Technology, Development and Environment</i>	Special issue of <i>Science, Technology and Society</i> , Sage
October 9-10, 2009	TISS Mumbai	<i>Science, Technology and Economy: Emerging and Developed Countries</i>	Different Professional Journals
October 17-18, 2008	ISID, Delhi	<i>Globalisation of Knowledge Development and Delivery</i>	Different Professional Journals
November 2-3, 2007	IIT Bombay	<i>Globalisation of Chinese and Indian Enterprises</i>	Book by <i>Routledge</i>
October 6-7, 2006	IHD and IIC, Delhi	<i>Knowledge Based Industries, Employment and Global Competitiveness</i>	Book by <i>Routledge</i>

**Conference Theme: *Technology and Employment***

(in partnership with Tata Trusts)

**Hosted by: Tata Institute of Social Sciences, Mumbai**

Issues for discussion:

- Digitalisation
- Artificial Intelligence
- Robots
- Social and other dimensions
- Internationalisation - FDI and trade
- Technology, supply chain and production
- Inequality
- Big data.

**Conference Format**

The conference will have an introductory session followed by Competitive Sessions. In the competitive sessions all the papers will be refereed before accepted for presentations.

**Important Dates:**

- **Last date for submission of title of papers and abstracts May 30, 2018.**
- **Last date for full paper submission July 30,2018**

Send the abstracts and paper to [fgksindia@gmail.com](mailto:fgksindia@gmail.com)

**N S Siddharthan and K Narayanan**

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## *Appendix: Seminars and Conferences Organised*

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### **Silver Jubilee Seminar of the Madras School of Economics on “Technology and Development, organised in partnership with Knowledge Forum, August 11, 2018.**

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Scholars from the following institutions presented papers:

- Indian Institute of Technology (IIT) Bombay
- IIT Goa
- IIT Madras
- Madras School of Economics
- Great Lakes Institute of Management, Chennai
- Jadavpur University
- Institute of Economic Growth, Delhi
- Centre for Development Studies, Trivandrum
- Institute for Financial Management and Research, Chennai
- Madras Institute of Development Studies, Chennai

One important feature of the conference was the active participation of the Post Graduate students of the Madras School of Economics. About 150 students attended all the Sessions and actively took part in organising the conference.

#### **Tour of Sessions and Main Findings**

In the Introductory Session Professor C Rangarajan, Chairman, MSE delivered the Key-note address.

‘Technology and Development’ is a broad theme and covers several dimensions. The one day conference covered several of these dimensions. The world is in the midst of Information Technology (IT) and Knowledge revolution and it was appropriate that the conference started with papers dealing with IT. One of the very first sectors to embrace IT is the Banking sector and the first paper dealt with the banking sector.

The paper by Shanmugam and Rakesh Nigam analysed the impact of IT on performance of banks in India. They used machine learning method for clustering data to analyse. In recent years several scholars from physics have been collaborating with economists to analyse economic problems. We have been having some of the physics scholars presenting papers at the Knowledge Forum conferences. Most of them are unhappy with the methodology used by economists. They advocate the use of physics models do analyse economic phenomenon. As a result a new discipline had emerged – Econophysics. This paper comes close to the new discipline.

The paper by Simontini Das and Amrita Chatterjee investigated the role of IT in improving the financial inclusion of the major Indian States. To begin with they also used the cluster analysis and later on switched over to other econometric techniques. Their results showed that technology played an important role in financial inclusion but with a time lag. More importantly the study identified the socio economic variables influencing financial inclusion. Another important dimension of the theme is technology and labour. There were two papers dealing with labour and employment. The first paper by Arup Mitra along with technology and employment introduced the productivity dimension. What is needed is the growth in

productive employment. The paper analysed the impact of technical efficiency and total factor productivity growth on labour absorption. The paper did not find any evidence for a decline in employment due to higher total factor productivity growth. At the same time it did not find evidence in favour of employment growth either. The results were based on employment intensity. The impact of technology on the overall growth of employment could be different.

The paper by Vidya Mahambare and Sowmya Dhanaraj dealt with the low female participation in the technology intensive industries. They found that access to urban infrastructure and in particular transport facilities important in influencing female work participation.

The next session was devoted to several other dimensions. The paper by Radeef Chundakkadan & Subash Sasidharan, investigated the financial constraints and innovation activities of firms. It showed a negative impact of financial constraints on innovative activities, however, government support to innovative activities could mitigate these constraints and promote innovation.

The paper by K J Joseph and Kiran Kumar, analysed the relative role of science based learning and experience based learning in determining total factor productivity. This is the first paper to deal with this complex issue. The paper also highlighted the role of domestic technology purchases, staff training and managerial experience along with overall institutional architecture and labour market institutions, which were overlooked by the earlier studies.

The paper by Mohina Saxena and Surajit Bhattacharya was a theoretical piece and they developed a three-stage sequential game and showed that if the levered duopolist undertook investment in (process) innovation, then the debt induced innovation driven output was higher than the innovation led output of a completely equity financed duopolist.

The paper by Sunil Paul and Santosh Kumar Sahu analysed the relative importance of aggregate demand shocks and technology shocks in influencing productivity and technical efficiency. Their results indicated the transitory nature of aggregate demand shocks compared to technology shocks.

The paper by Asmita Goswami and K Narayanan analysed the influence of technology efforts on firm level productivity. They found technology imports – both, embodied and disembodied – having a positive impact on productivity of firms. However, in-house R&D efforts contributed to productivity only in the presence of skilled labour force.

Madhuri Saripalle analysed the determinants of the adoption of bio-stimulants based on experiments conducted over 200 rural farms. The paper found reduced use of chemicals in the user farms.

The paper by Debapriya Das and Zareena Begum Irfan was mainly a theoretical paper. It dealt with reducing energy poverty and attaining energy security. The paper advocated policy intervention, choice of technology and monitoring attenuation.

In the concluding Session Professor K L Krishna delivered the Valedictory Address. It was chaired by Professor U Sankar.



**Seminar on FDI: Issues and Policy, Saturday, February 24, 2018, (In partnership with Tata Trusts), Hosted by: Centre for Policy Studies, IIT Bombay, Mumbai**

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In recent years Knowledge Forum Annual Conferences have been having Sessions on FDI. Research papers presented in these sessions have been subsequently published in professional journals and edited volumes published by *Springer*. These are mainly read by scholars who are interested in this area. It is now felt that issues arising out of these studies and their policy implications needs to be made available to a wider audience and in particular to the policy makers. With this in mind Knowledge Forum organized a Seminar jointly with the Centre for Policy Studies, IIT Bombay, on February 24, 2018 at IIT Bombay.

For this purpose, we invited scholars who have been presenting research studies on FDI in the Knowledge Forum Conferences to present papers dealing with the main issues in this area and the policy imperatives based on their research and findings of other scholars. About 45 persons registered and participated.

Professor S R Hashim Chaired the introductory session. Professor Satish Agnihotri, Head, Centre for Policy Studies, IIT Bombay, welcomed the participants. Professor N. S. Siddharthan, Hon. Director Knowledge Forum and, Honorary Professor, Madras School of Economics, Chennai, delivered the Keynote address. Professor K Narayanan of IIT Bombay and Convener of the conferences of Knowledge Forum proposed the vote of thanks.

### **Technical Sessions**

The following persons chaired the Technical Sessions:

- K L Krishna, Chairman MIDS, Chennai and former Director, Delhi School of Economics
- K Narayanan, IIT Bombay
- Satish Agnihotri, IIT Bombay
- N S Siddharthan, Knowledge Forum and MSE

### **Issues Discussed**

- FDI in Manufacturing
- Push factors of outward FDI
- FDI and Exports
- FDI and spillovers
- FDI, R&D, patenting and spillovers
- Environmental policies and FDI
- Industry case studies

In the concluding Session, Professor K L Krishna delivered the Valedictory Address.

**XII Annual Conference on *Changing Paradigms in Technology, Trade and Development*, in partnership with Tata Trusts, Hosted by: Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, November 10-12, 2017**

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About 65 persons from 25 institutions registered and participated in the conference.

Professor S R Hashim, President, Knowledge Forum, Chaired the Introductory Session. Professor Srijit Mishra (Director NCDS) welcomed the participants. Professor N S Siddharthan presented the 'Tour of the sessions' and Professor K Narayanan (IIT Bombay and co-editor of the volume) gave an introduction to the volume published by *Springer* containing select papers presented at our 2016 conference held at IIT Madras. Professor Hashim released the volume. Professor K Narayanan proposed the vote of thanks.

The *Governing Council* and the *General Body* meetings were chaired by Professor S R Hashim, President of the Forum. The General Body decided the following theme for the 13<sup>th</sup> Annual Conference:

***Technology and Employment***

The 2018 conference will be hosted by the **Tata Institute of Social Sciences**, Mumbai.

**Participation**

Scholars from the following institutions participated:

***International***

1. Georgetown University, Washington DC.
2. Centre for International Environmental Studies, Graduate Institute of Geneva, Switzerland
3. CUNY Brooklyn College and Graduate Center, New York.
4. United Nations University, Maastricht, the Netherlands.
5. Pardos, France

***Delhi***

6. Delhi University
7. JNU
8. CSIR-NISTADS
9. ISID
10. Society for Development Studies
11. Institute of Economic Growth

### ***Mumbai***

12. IIT Bombay
13. Tata Institute of Social Sciences (TISS)

### ***Chennai***

14. Madras School of Economics
15. IIT Madras
16. Madras Institute of Development Studies

### ***Bangalore/Karnataka***

17. Indian Space Research Organisation (ISRO)
18. National Institute of Technology Karnataka (NITK), Surathkal
19. LifeIntellect, Bangalore

### ***Other Cities***

20. NCDS Bhubaneswar
21. IIT Indore
22. Institute of Public Enterprise, Hyderabad
23. National Institute of Technology Goa
24. Punjab School of Economics, Guru Nanak Dev University, Amritsar, Punjab

## **Technical Sessions:**

21 research papers were presented. In addition there was a Ph.D. workshop with 3 presentations.

The following persons Chaired the technical sessions and initiated discussions:

- **K. L. Krishna**, Chairman MIDS and former Director Delhi School of Economics, (DSE)
- **Ashok Jain**, Former Director, NISTAD CSIR
- **Stanley Nollen** (Georgetown University, Washington D.C.)
- **B L Pandit** (Delhi School of Economics)
- **B N Goldar** (IEG Delhi)
- **Y. S. Rajan**, Distinguished Professor (ISRO)

### **Session 1: *FDI***

Issues Discussed:

- FDI Spillovers and country of origin.
- FDI and ecological footprints
- Surge in FDI inflows

## **Session 2: *Environment and Resources***

Issues Discussed:

- Relocation and innovation in polluting industries
- Declining energy intensity in energy intensive industries
- Paradigm shifts in irrigation sector

## **Session 3: *Innovations, R&D and IPR***

Issues Discussed:

- International harmonization of IPR and growth
- R&D behavior of foreign firms
- Knowledge spillovers and R&D
- Innovation and competition

## **Session 4: *Interplay of Knowledge Sources***

Issues Discussed:

- Knowledge sources of innovations
- Market structure and technological capabilities
- Broad band adoption and firm performance in the informal sector

## **Session 5: *Trade and global production process***

Issues Discussed:

- Changing pattern of global production process
- Trade liberalization and export performance
- Free trade agreements and FDI

## **Session 6: *Changing Paradigms***

Issues Discussed:

- Changing paradigms in solar industry
- Patents and paradigm changes
- Paradigm shifts in information technology – Quantum computers
- Econophysics – paradigm shift in economic methodology

## **Session 7: *Ph.D. Workshop***

### ***Concluding Session***

In the concluding session the participants expressed their appreciation and thanked the hosts, NCDS Bhubaneswar, for efficiently organizing an excellent conference. Professor Narayanan proposed a vote of thanks.

**XI Annual Conference on “Globalisation of Technology and Development”, Hosted by:  
Indian Institute of Technology Madras, Chennai, 2-5, December, 2016**

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About 90 persons from 30 institutions registered and participated in the conference. Professor S R Hashim, President, Knowledge Forum, could not attend because of the sudden cancellation of his flight from Delhi. In his absence Professor Stanley Nollen (Georgetown University and Vice President of the Forum), Chaired the Introductory Session. Professor Malathy Duraisamy (HoD HSS IIT Madras) welcomed the participants. Professor N S Siddharthan presented the ‘Tour of the sessions’ and Professor Kensuke Fukushi (Tokyo University) delivered the ‘Key Note’ address. Professor K Narayanan (IIT Bombay and co editor of the volume) gave an introduction to the volume published by *Springer* containing select papers presented at our 2014 conference and 2015 March workshop. Professor A K Mishra (Dean Academic Research, IIT M) released the volume. Professor K Narayanan proposed the vote of thanks.

The *Governing Council* and the *General Body* meetings were Chaired by Professor Y S Rajan (ISRO and Vice President of the Forum). The General Body decided the following theme for the 12<sup>th</sup> Annual Conference:

***Changing Paradigms in Technology, Trade and Development***

**Participation**

Scholars from the following institutions participated:

***International***

1. Georgetown University, Washington DC.
2. Centre for International Environmental Studies, Graduate Institute of Geneva, Switzerland
3. CUNY Brooklyn College and Graduate Center
4. Tokyo University
5. United Nations University, Maastricht, the Netherlands.
6. ILO Geneva

***Delhi***

7. Delhi University
8. JNU
9. CSIR-NISTADS
10. ISID
11. Society for Development Studies

***Mumbai***

12. IIT Bombay
13. Tata Institute of Social Sciences (TISS)
14. eSocialSciences
15. Reserve Bank of India
16. Tata Trusts

### ***Chennai***

17. Madras School of Economics
18. IIT Madras
19. Madras Institute of Development Studies
20. IFMR
21. MIDS
22. Indian Institute of Materials Management

### ***Bangalore/Karnataka***

23. Indian Space Research Organisation (ISRO)
24. Institute for Social and Economic Change (ISEC)
25. National Institute of Technology Karnataka (NITK), Surathkal
26. IIM Bangalore

### ***Kerala***

27. CDS Trivandrum
28. IIM Kozhikode

### ***Other Cities***

29. Rajiv Gandhi Indian Institute of Management, Shillong
30. IIT Indore

## **Technical Sessions:**

21 research papers and 4 case studies were presented.

The following persons Chaired the technical sessions and initiated discussions:

- **K. L. Krishna**, Chairman MIDS and former Director Delhi School of Economics, (DSE)
- **N. S. Siddharthan**, Hon. Director Knowledge Forum and Hon. Professor Madras School of Economics
- **Y. S. Rajan**, Distinguished Professor (ISRO)
- **Malathy Duraisamy**, Head H&SS, IITM
- **Ashok Jain**, Former Director, NISTAD CSIR
- **P. Duraisamy**, ICSSR National Fellow MIDS and former Head Dept. of Econometrics, University of Madras
- **Stanley Nollen** (Georgetown University, Washington D.C.)

### **Session 1: *FDI Spillovers***

Issues Discussed:

- Worldwide shift of FDI to services and its impact
- Firm capabilities and FDI spillovers
- Employment growth, exchange rate volatility and FDI

### **Session 2: *Outward FDI***

Issues Discussed:

- M&A and outward FDI
- Outward FDI and international production network
- Pull and push factors of FDI

### **Session 3: *FDI Other Issues***

Issues Discussed:

- FDI and business cycle co-movements
- Culture, quality of innovations and governance
- Domestic private investments and FDI

### **Session 4: *Innovations***

Issues Discussed:

- Innovation, product life cycles and intellectual property rights protection
- Organizational learning capability for responding to innovation and change
- Board characteristics, ownership structure and technological efforts

### **Session 5: *Information Technology***

Issues Discussed:

- Global technologies and higher education in India
- ICT and SMEs

### **Session 6: *Technology***

Issues Discussed:

- Intra industry trade and technology
- Globalisation and growth

### **Session 7: *Industry Studies***

- Pharmaceutical industry: New patent regime and monopoly power
- Basic metals: Productivity and determinants
- Paper and pulp industry: Technical change and energy efficiency
- Auto component industry: Labour, information technology and knowledge management

### **Session 8: *Brainstorming Session on Changing Nature of FDI***

- Changing Nature of FDI: Need to re-examine the productivity spillovers
- FDI: Shift to services
- Technology services

### **Session 9: *IIT Madras Case Studies***

- Patents and IPR management
- Joint ventures and know-how transfer
- Solar desalination technologies
- Micro-electronics industry

In the concluding session the participants expressed their appreciation and thanks to the hosts, IIT Madras, for efficiently organizing an excellent conference and in particular were full of admiration for the student volunteers for their enthusiasm and helpful nature.

**Seminar on “Creation and Diffusion of Technology”, Hosted by: Indian Institute of Technology Bombay, Mumbai, 18th March, 2016**

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More than 50 persons from 14 institutions registered and participated in the conference. 11 research papers were presented. In addition four scholars presented studies in the Panel Discussion. Scholars from the following Institutions participated:

***International:***

1. KU Leuven University, Belgium
2. Maastricht University, The Netherlands
3. Asian Institute of Technology, Thailand

***Mumbai:***

4. Indian Institute of Technology Bombay
5. Tata Institute of Social Sciences
6. Tata Trusts
7. Government of Maharashtra

***Other Cities***

8. Madras School of Economics, Chennai
9. Institute of Financial Management and Research, Chennai
10. Institute for Human Development, Delhi
11. NISTADS – CSIR, Delhi
12. JNU, Delhi
13. National Institute of Technology, Suratkal
14. Jadavpur University, Kolkata

**Technical Sessions**

***Technical Session I – International Dimensions***

**Chair/ Discussant: N S Siddharthan, Madras School of Economics and Knowledge Forum**

Issues Discussed

- Research intermediaries and collaborative R&D
- Productivity growth, innovations and management practices
- Technology transfer in waste management

***Technical Session II – R&D, Patenting, FDI***

**Chair/ Discussant: Filip de Beule, KU Leuven University, Belgium**

Issues Discussed

- R&D spillovers and in-house R&D
- Determinants of ICT
- FDI flows and technology choice



***Technical Session III - Technology, Policy and the Environment***

**Chair/ Discussant: Pierre Mohnen, Maastricht University, The Netherlands**

- Mobile penetration
- Technology, GHGs emissions and productivity
- Nanotechnology development

***Technical Session IV – Livelihood and Employment***

**Chair/ Discussant: C. Visvanathan, Asian Institute of Technology, Thailand**

- Law, skills and job creations
- Technology and livelihood

In addition to the four technical sessions there was also a panel discussion on the seminar theme Chaired by S R Hashim, President, Knowledge Forum and Chairman, IHD.

“Technology, Growth and Sustainability”, co-organised by the Indian National Academy of Engineering (INAE) and hosted by National Institute for Advanced Studies (NIAS) Bangalore and in Partnership with Tata Trusts, and with financial support from, ISRO, DST and ICSSR.

More than 60 persons from 25 institutions registered and participated in the conference.

In the introductory session, the volume published by *Springer* containing select papers from the 2013 annual conference (hosted by IIT Bombay) was released. In addition to the technical sessions there was also a panel discussing on the global dimensions of the conference theme.

25 research papers were presented.

Scholars from the following institutions participated:

***International***

1. United Nations University, Maastricht, the Netherlands.
2. Georgetown University, Washington DC.

***Delhi***

3. ICRIER
4. Delhi School of Economics
5. Institute of Economic Growth
6. CSIR-NISTADS
7. Institute for Human Development
8. JNU

***Mumbai***

9. IIT Bombay
10. Tata Institute of Social Sciences (TISS)

***Chennai***

11. Madras School of Economics
12. IIT Madras
13. Madras Institute of Development Studies

***Kolkata***

14. IDBI Bank
15. Jadavpur University
16. Bethune College

### ***Bangalore/Karnataka***

17. National Institute of Advance Studies (NIAS)
18. Indian Institute of Science
19. Indian Space Research Organisation (ISRO)
20. Institute for Social and Economic Change (ISEC)
21. National Institute of Technology Karnataka (NITK), Surathkal

### ***Other Cities***

22. Tripura University
23. Indian Institute of Space Sciences and Technology, Trivandrum, Kerala.

### **Technical Sessions:**

**Session 1: Exports, OFDI and Competitiveness:** Chair: K. L. Krishna (MIDS and DSE)

Issues Discussed:

- Impact of reduction of carbon emissions on export competitiveness.
- FDI spillovers and exports
- Information technology and export performance
- Financial constraints, productivity and outward FDI

**Session 2: R & D and Innovations:** Chair: B N Goldar (IEG)

Issues Discussed:

- R & D, total factor productivity and technology imports
- Upgrading in the Indian garment industry

**Session 3: INAE Session: Technology Challenges for National Growth:** Chair: Adimurthy (ISRO)

Issues Discussed:

- Remote sensing technology for disaster management
- Socio economic impact of satellite navigation systems
- Urban transportation, pollution and environmental damages due to ship emissions
- Urban transport policies in the context of climate change
- Sustainable supply chain, space technology and knowledge management in agriculture
- Augmentation of technical innovations, and Indian space programme – touching lives.

**Session 4: Education and Skill Development:** Chair: Alakh Sharma (IHD)

Issues Discussed:

- Use of technology in providing engineering education

- Skill scarcity in Indian manufacturing
- New education technologies in higher education

**Session 5: Agriculture:** Chair: R S Deshpande (ISEC)

Issues Discussed:

- Agriculture Intensification Population Growth and Cropland Expansion

**Session 6: Productivity:** Chair: B L Pandit (DSE)

Issues Discussed:

- Productivity and foreign investment
- Productivity, energy intensity and output

**Session 7: Diversities:** Chair: S R Hashim (President, Knowledge Forum)

- Technology and growth disparity among states
- Regional diversity of development
- Resources and climate change

In addition to the seven technical sessions there was also a panel discussion on the global dimensions of the theme Chaired by Y S Rajan of ISRO

Saturday the **March 7, 2015**. Hosted by *Tata Institute of Social Sciences*, Mumbai.

**Following nine presentations were made in four sessions:**

**I. Technology and Society**

1. **Y S Rajan** (ISRO): *Technology & Wealth : Creation and Distribution* (ISRO, Bangalore)
2. **Narayanan, N.C., Chetan Singh Solanki and Jayendran Venkateswaran** (IIT B, Centre for Technology Alternatives for Rural Areas), *Scaling up Technology Alternatives by Localisation: Case of Solar Study Lamps in Rural India*
3. **Krithi Ramamritham** (IIT B, Computer Science), *Science and Technology for the Urban Forgotten*

**II. Technology and Development**

4. **Santosh K. Sahu and Sukanya Das** (Madras School of Economics), *Impact of Agricultural Related Technology Adoption on Poverty and Inequality: A Study of Select Households in Rural India*
5. **Bino Paul and Ashutosh B Murti** (TISS) : *Socio-Economy of Mobile Phone Ownership in India*

**III. Technology and Education**

6. **K Lal** (UNU MERIT, The Netherlands) and **Shampa Paul** (SDS, Delhi): *ICTs as Enabler in Higher Education*
7. **Kannan Moudgalya** (IIT B, Chemical Engineering), *A pyramid structure for empowerment through Spoken Tutorials and Open Source Source Software.*
8. **Kalpana Kannan and K. Narayanan** (IIT B, Dept. of Humanities and Social Sciences), *Using Technologies to Reduce Unequal Access in Teacher Training*

**IV. Modern Technology and Science**

9. **G Baskaran** (Institute of Mathematical Sciences, Chennai) *Next Einsteins from the Developing World - Can Modern Technology Help?*

**IX Annual Conference on “Technology: Corporate and Social Dimensions” Hosted by NIAS, Bangalore. October 27-29, 2014**

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(Select papers published in the *Journal of Industrial Statistics*. The Case Studies will be published by INAE)

More than 69 persons from 30 institutions registered and participated in the conference.

Delegates from the following institutions participated:

From Overseas:

1. Georgetown University, Washington DC, USA.
2. K U Leuven, Antwerpen, Belgium

From Mumbai and Maharashtra:

3. Indian Institute of Technology (IIT Bombay)
4. Bhaba Atomic Research Centre (BARC)
5. Institute of Chemical Engineering.
6. Tata Institute of Social Sciences
7. eSocialSciences
8. Government College of Engineering, Pune

From Bangalore and Karnataka:

9. National Institute of Advanced Studies (NIAS)
10. Indian Space Research Organisation (ISRO)
11. Indian Institute of Science (IISc)
12. ANTRIX and ISRO
13. ADA
14. NITK Surathkal
15. IBAB

From Chennai:

16. IIT Madras
17. Madras School of Economics
18. Institute of Financial Management and Research

From Delhi:

19. Institute of Informatics and Communications, Delhi University
20. Delhi School of Economics, Delhi University
21. Institute of Economic Growth
22. Institute for Human Development
23. IDBI Bank
24. Ministry of Finance
25. Society for Development Studies
26. Indian National Academy of Engineering

From Other Indian Cities:

27. IIT Indore
28. IIT Hyderabad
29. Bethune College Kolkata
30. DRDO

In the Introductory Session chaired by Professor Hashim, Professor Rajaram Nagappa (NIAS) welcomed the participants and Professor Baldev Raj (INAE & NIAS) spoke on collaborations between the Knowledge Forum and INAE & NIAS. Professor N S Siddharthan introduced the Session themes and the papers. Professor Stanley Nollen gave the Keynote address. After remarks from the Chair, Professor K Narayanan proposed the vote of thanks.

The conference had two **Keynote Addresses**, the first one delivered by Professor Stanley Nollen of Georgetown University, Washington DC and the second by Dr. K Kasturirangan, Former Member of the Planning Commission.

### **Technical Sessions:**

#### **1. Multinational Enterprises:** Chair: B L Pandit (DSE)

Issues Discussed

- Impact of FDI on firms performance
- Comparisons of technological and other characteristics of multinationals and domestic firms

#### **2. Employment:** Chair: K Narayanan (IIT B)

Issues Discussed

- Innovation and employment
- FDI, technology acquisition and demand for labour

#### **3. Case Studies:** Chair: B N Suresh (ISRO)

Issues Discussed

- Social benefits of Indian earth observation satellites
- Radiation and food technology
- Advanced composite technology for aircraft
- Human waste disposable systems

#### **4. Inter disciplinary:** Chair: N S Siddharthan (MSE)

Issues Discussed

- Technology intensity and complexity measure in Indian exports
- Innovations, human capital and income differences

**5. Technology and Productivity:** Chair: S R Hashim (IHD)

Issues Discussed

- Patenting on firm efficiency and productivity
- Total factor productivity, employment and openness
- R&D, imported inputs and productivity

**6. Environment and Development:** Chair Bino Paul (TISS)

Issues Discussed

- Environmental certification and technical efficiency
- Environmental consciousness: Determinants

**7. Policy Issues:** Chair: Arup Mitra (IEG)

Issues Discussed

- Industrial policy and technology gap
- Quality of institutions and profits
- Profits and the base of the pyramid

**8. Innovative Efforts:** Chair: Filip De Beule (K U Leuven, Belgium)

Issues Discussed

- Business groups and R&D activities
- Mergers and acquisitions and R&D activities

**9. Techno Social Issues:** Chair: Ashok Jain (NISTAD)

Issues Discussed

- Technology, livelihood and employment in agriculture
- Sustainable farm livelihoods
- Product startup and minimum viable product

In addition to the nine technical sessions there was a session on University – Industry collaborations based on invited presentation and a Ph.D. students workshop.



***VIII Annual Conference October 25-27, 2013, Hosted by IIT Bombay and supported by KU Leuven, Belgium. Conference Theme: Emerging Technologies and Development***

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More than 80 persons registered and participated in the conference. Delegates from following institutions participated:

From Europe:

1. University of Antwerp
2. K U Leuven, Antwerpen, Belgium
3. Pardos, France

From USA:

4. George Town University, Washington DC

From Mumbai (Bombay) and Maharashtra:

5. Indian Institute of Technology Bombay (IIT Bomay)
6. National Institute of Industrial Engineering [NITIE], Mumbai
7. Tata Institute of Social Sciences, Mumbai
8. MES's Pillai's Institute of Information Technology, Engineering, Media Studies and Research, Mumbai
9. eSocialSciences, Mumbai
10. Symbiosis International University, Pune

From Delhi and National Capital Region:

11. IIT Delhi
12. Delhi School of Economics
13. Institute of Economic Growth, Delhi
14. IDBI Bank, Delhi
15. Society for Development Studies, Delhi
16. Amity University (Noida)
17. Technology, Information, Forecasting and Assessment Council, Department of Science and Technology, Government of India, Delhi

From Chennai (Madras) and Tamil Nadu:

18. IIT Madras
19. Madras School of Economics (Chennai)
20. Institute for Financial Management and Research Madras, Chennai
21. Indian Institute of Management (IIM), Tiruchirappalli

From Kolkata:

22. Bethune College, Kolkata
23. Jadavpur University, Kolkata

From Other Indian Cities:

24. IIT Indore
25. IIM Lucknow
26. Central University Gujarat
27. Indian Space Research Organisation (ISRO), Bangalore

In the Introductory Session, Professor Karuna Jain, Director, National Institute of Industrial Engineering, Mumbai, delivered the theme address. This was followed by Technical Sessions.

### Technical Sessions:

- I. **Foreign Direct Investments** – Chair/Discussant: Stanley Nollen (George Town University, Washington DC).

Issues discussed:

- Direction of outward FDI of Indian manufacturing firms: Influence of technology and firm productivity
- Outward FDI, firm heterogeneity and technological efforts
- FDI in wind energy – impact of state policies
- FDI, technological choices and spillovers

- II. **Innovations** - Chair/Discussant: Daniel Van Den Bulcke (University of Antwerp)

Issues Discussed

- Innovation by firms
- Knowledge resources and decision to export
- Institutions and innovations
- Clean development mechanism and exports
- Geography of patenting

- III. **R & D Related Issues** – Chair/Discussant: K L Krishna (Delhi School of Economics)

Issues Discussed:

- R & D and financing constraints
- R & D Spillovers
- Productivity, technical efficiency and ICT

- IV. **Technology and Policy** – Chair/Discussant: Ashok Jain (Former Director NISTADS)

Issues Discussed:

- Innovative capabilities of Indian companies in cross-border acquisitions
- Genetically modified crops and farm livelihoods

- Policy shifts in urban sanitation: Public Private Partnerships.

In addition to these technical (competitive) sessions, there were also two *Case Studies* sessions.

V. **Case Studies: Technology** – Chair: B L Pandit (Delhi School of Economics)

Cases Discussed:

- Technology intermediation – Case study of TIFAC
- Longitudinal trends in competitiveness
- Components for photovoltaic panels, a case study

VI. **Case Studies: Socio economic Issues** – Chair: Alakh Sharma (Director IHD)

Cases Discussed:

- Poverty and social entrepreneurship
- Electronic voting machines
- Spoken tutorials for IT literacy
- Improved cook stoves

On 27<sup>th</sup> October two **Research Workshops** were conducted. Research Scholars presented their research findings.

VII. **Workshop on Social Sciences** – Chair: S R Hashim (President Knowledge Forum)

Themes Discussed:

- Social networks in corporate sector
- Technological change and capital – labour relations
- Harnessing tacit knowledge for innovation
- Impact of affluence and population on agrochemical use in India

VIII. **Workshop on Technology** – Chair: Milind V Rane, (Department of Mechanical Engineering, IIT Bombay)

Themes Discussed:

- Measurement technologies for urban heat islands and impact on urban climate patterns.
- Planning for integration of solar Photovoltaics in to the energy needs
- Solar collector for agro produce drying

Towards the end of this last session Professor K Narayanan (Convenor of Conferences) proposed a vote of thanks.

***Seventh Annual Conference: “Technology Intensity and Global Competitiveness”***  
***(Symbiosis International University, Pune, November 30 – 2<sup>nd</sup> December, 2012)***

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The Seventh Annual Conference was hosted by the Symbiosis International University Pune, and the conference was held at their Lavale campus. About 67 scholars registered and participated in the conference. In addition to Knowledge Forum members, scholars from Symbiosis International University also presented papers and participated in the discussions. In the Introductory Session on November 30, two sets of select papers presented at the 2010 Annual Conference were released. The first was a book published by *Springer* (“***Human Capital and Development: The Indian Experience***”) and the second set published in the special issue of the journal, *Contributions to Indian Social Science*. On December 1, 2012 the web version of the special issue of the journal *Science, Technology and Society* containing select papers from the 2011 Goa conference was released. The print edition of the journal will follow.

Papers were presented in the 2012 Annual Conference in the following technical sessions:

1. Technology and Internationalisation - Chair/Discussant: Y. S. Rajan (ISRO)
2. Technology and Global Operations – Auto Sector - Chair/Discussant: Ashok Jain (Former Director NISTAD)
3. Technology and Global Operations – Pharmaceuticals - Chair/Discussant: N. S. Siddharthan (Hon. Director, Knowledge Forum)
4. Technology and Global Operations - Other Sectors - B. L. Pandit (DSE)
5. Socio-Economic Issues - Chair/Discussant: S. R. Hashim President, Knowledge Forum)
6. Studies on Pollution and Environmental Regulations - Chair/Discussant: T. P. Singh (SIU)
7. Technology and Export Orientation: SMEs - Jyoti Chandiramani (SIU)

Following Scholars from Symbiosis International University acted as Rapporteurs:

- Akshay Malhotra, Viswas Purohit, Rupali Nagar, Brajesh Pandey, Himanshu Agrawal, Medha Dhande, Anindita Ghosh.

The following papers were presented:

1. Filip De Beule and Dieter Somers (Lessius University College, Antwerp, Belgium), “The Reasons for and Impact of the Internationalization of Research and Development: The Case of Indian Multinationals”.
2. Françoise Pardos (Pardos Marketing, Paris), “Technology Intensity and Innovations in the next Thirty Years”.
3. A. S. Rao, “INDIA: a *fab-less* wonder: Case of SMDP”.
4. G. D. Sandhya (NISTAD, New Delhi) “Role of S&T and Innovation Policies in Transforming the National Innovation System in China: Lessons for India”.
5. Neelam Singh (Economics Department, Lady Shri Ram College, Delhi University, Delhi), “Technological Efforts and Global Operations: Indian Auto Component Firms”.
6. Rahul Z. More and Karuna Jain, (SJM School of Management, IIT Bombay, Mumbai), “Innovation and Competitiveness among the Firms in the Automobile Cluster in Pune”.
7. B. S. Sangha (Institute for Autoparts and Hand Tools Technology, Ludhiana), T. P. Singh (Symbiosis International University, Pune) and Ajay Batish (Mechanical Engineering

- Department, Thapar University, Patiala), “An Assessment of Regional Innovation System among Small Scale Auto Parts Industry of Punjab, India”.
8. Bishwanath Goldar (IEG & CITD, JNU, Delhi), “R&D Intensity and Exports: A Study of Indian Pharmaceutical Firms”.
  9. Vidhisha Vyas, K. Narayanan, and A. Ramanathan, (Department of H&SS, IIT Bombay, Mumbai), “Mergers & Acquisitions, Technological Efforts and Exports: A Study of Pharmaceutical Sector in India”.
  10. Pradeep Kumar Keshari (IDBI Bank, New Delhi), “Technological Determinants of Competitive Advantage in the Indian Machinery Industry”.
  11. Ronny Thomas and K. Narayanan (Department of H&SS, IIT Bombay, Mumbai), “Productivity Heterogeneity and Exports: A Study of Indian Manufacturing Industries”.
  12. Narayan R. Pisharoty (Symbiosis Institute of Technology, Pune), “Analysis of Electronics Industry Recommendations and the Growth Aimed Policy Announced Recently by GOI”.
  13. Arup Mitra (IEG, Delhi) and Chandan Sharma (Department of Economics, NIFM, Faridabad), “Technology Intensity and Global Competitiveness: Issues in Labour Cost and Employment”.
  14. Bino Paul G. D. (TISS, Mumbai), A. P. Achar (Sahydari College of Engineering and Management, Mangalore), and Krishna M. (Tata Institute of Social Sciences, Hyderabad), “What Makes Micro Enterprises Perform in a Jewellery Cluster? Seeing Space for Computer Aided Designing (CAD)”.
  15. Rajesh Panda , (Symbiosis Institute of Business Management, Pune), “Globalised India and Challenges for Sustainable Growth”
  16. Nivedita Dutta and K. Narayanan (Department of H&SS, IIT Bombay, Mumbai), “Econometric Estimation of Technical and Environmental Efficiency: An Application to Chemical Industry in and around Mumbai”.
  17. Santosh Kumar Sahu and K. Narayanan (Department of H&SS, IIT Bombay, Mumbai), “CO<sub>2</sub> Emission from Fossil Fuel Consumption and Technology Intensity: A Study of Indian Manufacturing Industries”.
  18. Arundhati Warke, Viswas Purohit (Symbiosis Institute of Technology, Pune), and Sanjeevani Shah (Smt. Kashibai Navale College of Engineering, Pune), “Statistical Analysis of Removal of Moisture from Bagase by Microwave Heating”.
  19. Jaya Prakash Pradhan (Central University of Gujarat) and Keshab Das (GSID, Ahmadabad), “Exports by Indian Manufacturing SMEs Regional Patterns and Determinants”.
  20. Kaushalesh Lal (Society for Development Studies, Delhi and MERIT, The Netherlands) and Shampa Paul (Institute of Development and Environmental Applied Studies, NOIDA), “Export Orientation and Firms’ Policy during Global Economic Slowdown”.

In addition to the technical sessions the conference also had a **Panel Discussion on *Interaction between Technology, Energy and Environment***. It was Chaired by K Narayanan. The Following panellists took part:

- Prof. Milind V. Rane, Department of Mechanical Engineering, IIT Bombay, Mumbai
- Prof. Bharat Bhushan, YASHADA, Pune
- Prof. Neetin Desai, D. Y. Patil University, Navi Mumbai
- Dr. A. R. Supate, Principle Scientific Officer, MPCB, Mumbai

***Sixth Annual Conference: “Agglomeration, Technology Clusters and Networks” (Goa, November 18-20, 2011)***

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The Sixth Annual Conference was held in collaboration with TIFAC and IASSI and was hosted by the Department of Economics, Goa University. The conference was held at the International Centre, Goa. The Inaugural session was chaired by Professor Dileep Deobagkar, Vice Chancellor Goa University and Dr. Anil Kakodkar, Chairman TIFAC and former Chairman Atomic Energy Commission delivered the Theme Address. About 65 scholars registered and participated in the conference. In addition to Knowledge Forum members, scholars from TIFAC also presented papers and participated in the discussions.

The following papers were presented:

1. Rakesh Basant, Pankaj Chandra, Rajesh S Upadhyayula, (IIM A), “Knowledge Flows and Capability Building in the Indian IT Sector: A Comparative Analysis of Cluster and Non-Cluster Locations”.
2. Smruti Ranjan Behera, Pami Dua, Bishwanath Goldar (Institute of Economic Growth and Delhi School of Economics), “Foreign Direct Investment and Technology Spillover: An Evaluation Across Different Clusters in India”.
3. Vinish Kathuria, (IIT B), “What Causes Agglomeration? – Policy or Infrastructure – A Study of Indian Manufacturing Industry”.
4. Haiyan Zhang, Zhi Yang and Danny Van Den Bulcke (University of Antwerp, Belgium) “Geographical and sectorial patterns of Indian and Chinese multinationals in Europe: A comparative analysis”.
5. Filip De Beule, (Lessius University College, Antwerp, Belgium ), “Foreign Subsidiaries in China: Local Responsiveness, Global Integration and Multinational Network Embeddedness”.
6. Filip De Beule and Van Beveren Ilke, (Lessius University College, Antwerp, Belgium) “Location and Network Determinants of Technology Seeking and Versus Technology Exploiting FDI”.
7. A S Rao, (Former Advisor DST), “Managing White Spaces in Building innovation Clusters”.
8. Santosh Kumar Sahu and K. Narayanan, (IIT B), “Energy Intensity and Firm Performance: Does Energy Cluster Matter?”.
9. Rani Maria Thomas and K. Narayanan, (IIT B), “A Comparative Study of Technology and Industry Clusters in India”.
10. Arup Mitra, (Institute of Economic Growth, Delhi), “Agglomeration Economies and Well-being: Evidence from India”.
11. Bino Paul and Krishna M, (TISS, Mumbai) “Urban Agglomeration and Labour Market: Emerging issues in India”.
12. Atsuko Kamiike, Takahiro Sato, Aradhna Agarwal, (Delhi University) “Productivity Dynamics in the Indian Pharmaceutical Industry: Evidences from Plant-level Panel”.
13. Nisha Taneja, Saon Ray and Neetika Kaushal, (ICRIER), “Opening India’s Garment Sector to South Asia”.
14. Majumder, TIFAC, “TIFAC’s experiences in SME Clusters”
15. Mukesh Mathur, TIFAC, “Innovation to Commercialization : TIFAC’s Experiences”
16. Ms. Sangeeta Baksi, TIFAC, “Technology Innovation in SMEs: TIFAC Initiatives in Advanced Composites”
17. Dr. Prabuddha Ganguli, CEO, Vision-IPR, Mumbai
18. Mr. Chandrasekhar T, Director, PFC, “IP Facilitation & Studies : Role of PFC”

**In addition there was a panel discussion and the following persons spoke in the panel:**

1. Biswanath Goldar (Institute of Economic Growth, Delhi)
2. A. V. Sapre, (Member Secretary, Rajiv Gandhi Science and Technology Commission, Government of Maharashtra)
3. N S Siddharthan (Knowledge Forum and MSE)
4. Sreekumar Panicker, (Eaton India Engineering Centre)

**Following persons Chaired/ acted as Discussants**

1. S R Hashim, President, Knowledge Forum and Chairman IASSI
2. K L Krishna, Former Director, Delhi School of Economics
3. P V Indiresan, Former Director IIT M
4. B L Pandit, Former Head, Delhi School of Economics
5. Y S Rajan, ISRO
6. Ashok Jain, Former Director NISTAD
7. Daniel Van Den Bulcke, University of Antwerp
8. N S Siddharthan, MSE and Knowledge Forum
9. P K Bose, Director, NIT, Agartala
10. K Narayanan, IIT Bombay

**At the Institute Mathematical Sciences (IMSc) Chennai, July 15-16**

***The workshop discussed misconduct, such as:***

- Plagiarism and self-plagiarism
- Data falsification, misrepresentation and selective use/suppression
- Undeclared conflicts of interest, undisclosed sources of funding
- Inappropriate authorship
- Ethical standards in animal and human experimentation and clinical trials

**Outcomes of the workshop:**

- A perspective on the global approach to these problems and what we can learn from other countries
- Identifying systemic problems that perpetuate misconduct, and solutions
- Formal mechanisms to deal with ethics issues, at the level of institutions and for the broader academic community
- Legal aspects of what sorts of punitive action are possible in cases of proven academic misconduct
- Guidelines on maintenance of repositories, lab books, computer code, etc

**Speakers**

- T A Abinandanan (Materials Engineering, IISc Bangalore)
- P Balam, (Director, IISc Bangalore; Editor, Current Science)
- Aparna Basu (NISTAD, Delhi)
- Gautam Desiraju (Solid State & Structural Chemistry, IISc Bangalore)
- Neelima Gupte (Physics, IIT Madras)
- S R Hashim (former Member Secretary, Planning Commission; former Chairman UPSC)
- Amar Jesani (Editorial Board, Indian Journal of Medical Ethics)
- Anuradha Lohia (CEO, Wellcome-DBT India Alliance)
- Gautam Menon (Institute of Mathematical Sciences, Chennai)
- Sunil Mukhi (Theoretical Physics, TIFR Mumbai)
- Rohini Muthuswami (Life Sciences, JNU, Delhi)
- K Narayanan (Head, Humanities and Social Sciences, IIT Bombay)
- N Raghuram (Biotechnology, GGS Indraprastha University, Delhi)
- Satyajit Rath (National Institute of Immunology, Delhi)
- Chiranjib Sen (IIM Bangalore)
- L S Shashidhara (IISER Pune)
- N S Siddharthan (Forum for Global Knowledge Sharing and Madras School of Economics)
- Rahul Siddharthan (Institute of Mathematical Sciences)
- D K Srivastava (Director Madras School of Economics)
- K VijayRaghavan (Director, NCBS, TIFR, Bangalore)



***Fifth Annual Conference: Science, Technology and Economy: Human Capital and Development. (IIT Bombay, November 11-12, 2010)***

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The Fifth Annual Conference was hosted by IIT Bombay. It was held jointly with IASSI. About 60 persons registered and participated in the conference. The conference started with Tarlok Singh Memorial Lecture delivered by Professor Yogesh Atal. In addition to technical sessions the conference had two panel discussions. The first was on ***Education Technologies***. It was chaired by Professor Ramanathan of IIT Bombay. The panellists were well known technologists. The second was on ***Issues in Human capital Development***. It was Chaired by Professor Ashok Jain (former director NISTAD). The panel consisted of industrialists, educationists, technologists and scientists.

In all the technical sessions the Chair also acted as Discussant. The first technical session was on ***Labour Skill and Development***. It was chaired by Professor K L Krishna (former director DSE). In all four papers were presented by scholars from Madras School of Economics, Institute of Economic Growth, Delhi, and IIT Bombay. The second session was on ***Education and Skill Formation***. It was Chaired by Professor Y S Rajan of ISRO. Papers were presented by scholars from TIFAC and Osmania University Hyderabad. The third session was devoted to presentation by Ph.D. scholars and was chaired by Karuna Jain of IIT Bombay. The fourth session was on ***Socio Economic Issues***. It was Chaired by B N Goldar of IEG, Delhi. Papers were presented by scholars from the University of Lancaster, Tata Institute of Social Sciences and IIT Bombay. The fifth session was on ***Poverty Alleviation***. It was chaired by Professor L M Bhole of IIT Bombay. The papers were from UNCTAD, Delhi School of Economics and Development Tracts RTC. The last (sixth) session was on ***International Studies*** and Professor V N Balasubramaniam of Lancaster University chaired the sessions. The papers were from UNU-MERIT, The Netherlands and Lessius University College, Antwerp, Belgium.

***Conference on “Frontier Issues in Technology, Development and Environment”, (Annual Conference of IASSI hosted by MSE in collaboration with Knowledge Forum) (Venue: Madras School of Economics, March 19 -21, 2010)***

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The Madras School of Economics (MSE) hosted the three day annual conference of IASSI in collaboration with the Knowledge Forum on “**The Frontier Issues in Technology, Development and Environment**”, March 19-21, 2010. In all 28 research papers were presented and discussed. The conference had two components.

1. Established scholars presented papers on frontier issues during the pre-lunch sessions.
2. The post-lunch sessions were devoted to Ph.D. workshop where students presented important chapters from their forthcoming Ph.D. dissertations and received comments. This gave an opportunity for several young scholars to participate and present their research findings to a larger audience.

About 60 persons registered and participated in the conference. In addition several others also attended without formal registration.

***Fourth Annual Conference: Science, Technology and Economy: Emerging and Developed Countries. (Tata Institute of Social Sciences, Mumbai, October 9-10, 2009)***

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The fourth annual conference was hosted by the Tata Institute of Social Sciences, Mumbai. The theme of the conference was ***Science, Technology and Economy: Emerging and Developed Countries***. About 45 persons registered and attended the conference. During the Inaugural Session the Volume “***Indian and Chinese Enterprises – Global Trade, Technology and Investment Regimes***”, edited by N S Siddharthan and K Narayanan, containing papers presented at the 2007 annual conference was released. The volume is published by Routledge simultaneously from New Delhi and London. The conference had four technical sessions and two panel discussions.

Under the first panel on the theme “***Science, Technology and Economy***” the following persons made presentations:

1. Françoise Pardos, Pardos Marketing, France
2. Y S Rajan, Confederation of Indian Industries (CII) and Former VC Punjab Technical University and Vice President Knowledge Forum
3. Ashok Jain, Former Director, NISTAD

Daniel van den Bulcke of the University of Antwerp chaired the session

Under the second panel on the theme “***Science, Technology and Employment***” the following persons made presentations:

1. Alakh Sharma, Director, IHD and Treasurer Knowledge Forum
2. Bhartendu Seth, IIT B
3. Bino Paul, TISS

Professor S R Hashim, President of the Forum and Director ISID chaired the session.

The Session on ***Multinational Enterprises*** was chaired by Stanley Nollen of Georgetown University, Washington DC, and K Narayanan of IIT B was the discussant. The papers were authored by:

1. V.N.Balasubramanyam, Lancaster University, and Nicolas Forsans, University of Leeds
2. Filip De Beule, Lessius University College, Antwerp, and Ilke Van Beveren, Catholic University of Leuven, Belgium.
3. Chiara Franco, University of Bologna, and Subash Sasidharan IIT M.

The Session on *Information and Communications Technology* was chaired by Y S Rajan, Vice-President of the Forum and Principal Advisor CII, and the discussant was T Jayaraman of TISS.

Papers were presented by

1. Aradhna Aggarwal, Delhi University
2. Stanley Nollen, Georgetown University
3. K. Narayanan (IIT B)

The Session on *Economics*, was Chaired by K L Krishna, former Director, Delhi School of Economics and Arindam Banik, IMI Delhi, was the discussant.

Papers were presented by

1. K. Lal, UNU-MERIT and Shampa paul, IEG
2. Saon Ray, TERI, Delhi
3. Bino Paul and M Krishna, TISS

The Session on *Science and Technology* was Chaired by P V Indiresan, Former Director, IIT M and U Sankar of Madras School of Economics acted as Discussant.

The following persons presented papers

1. Vinish Kathuria, and R. Mukundan, IIT B
2. Kannan Moudgalya. IIT B
3. Milind V Rane, IIT B
4. T. Jayaraman, TISS

***Third Annual Conference: Globalisation of Knowledge Development and Delivery,  
(Institute for the Study of Industrial Development (ISID,) Delhi, October 17-18, 2008)***

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The third annual conference was hosted by the Institute for the Study of Industrial Development (ISID), Delhi. The theme of the conference was ***Globalisation of Knowledge Development and Delivery***. About 45 persons registered and attended the conference. The conference covered the following issues: (a) Globalisation of R&D – FDI in R&D; (b) mass collaborations, strategic alliances, open source and peer production; (c) networking of universities, research institutions and industry. About 18 research papers were presented in the five sessions covering the following themes: (1) *Global Knowledge Networks* (2) *Globalisation of Knowledge Development and Delivery: Perspectives* (3) *European Experience* (4) *Manufacturing Sector* (5) *Information Technology*. In addition there was also a panel discussion. There was also an inaugural and concluding session wherein Professor S K Goyal, founder of ISID delivered the valedictory address.

Scholars from the following institutions presented papers and acted as discussant - University of Groningen, The Netherlands; Centre for European Economic Research, Germany; Lessius University College, School of Business, Antwerp, Belgium; University of Antwerp, Belgium; University of Oxford, UK; University of Nagoya, Japan; Pardos Marketing, France; Georgetown University, Washington DC, US; University of Leeds; Lancaster University, UK; United Nations University, the Netherlands; Tata Institute of Social Sciences, Mumbai; Institute of Mathematical Sciences, Chennai; Indian Institute of Technology, Bombay; Department of Science and Technology, Government of India, Delhi; Delhi School of Economics, Delhi University, Delhi; Lady Sriram College, Delhi University, Delhi; UNCTAD, Delhi; International Management Institute, Delhi; TIFAC Delhi; and ISID Delhi.

The theme of the second Annual Conference was ***Globalisation of Chinese and Indian Enterprises*** and the conference was jointly organised by Indian Institute of Technology Bombay and Knowledge Forum and was held at the Indian Institute of Technology Bombay, Mumbai. In all 87 delegates registered and participated in the seminar. From outside India, scholars from the University of Antwerp, Belgium; United Nations University – UNU-MERIT, the Netherlands; Kelley School of Business, Indiana University, USA; Georgetown University, Washington DC, USA; and Pardos Marketing, France participated. The Indian participants came from several academic institutions – universities and research institutions, United Nation agencies, Ministry of Science and Technology and the institutions supported by the Department of Science and Technology, and industry associations like Confederation of Indian Industry.

In addition to the inaugural and valedictory sessions, the seminar had five technical sessions. The 2006 conference volume was released in the inaugural session. The volume is published by *Routledge* and is brought out simultaneously from London and New Delhi. The inaugural address was delivered by Mr. Anwarul Hoda, Member –Industries, Planning Commission, Government of India. Professor Ashok Mishra, Director, IIT Bombay gave the Chairperson’s address. Professor Indiresan, President of the Knowledge Forum made the presidential remarks. Professor N S Siddharthan presented an introduction to the Knowledge Forum. The session started with a welcome speech by Professor Meenakshi Gupta and concluded with a vote of thanks by Professor K Narayanan. The valedictory session was chaired by Professor Juzer Vasi of IIT Bombay and the valedictory address was delivered by Professor P. V. Indiresan.

In all 18 research papers were presented in the five technical sessions. The technical sessions covered the following five themes:

- (1) China – India: MNE and FDI;
- (2) China – India: Technology and Productivity;
- (3) Technology: Innovation Systems, Management and Knowledge Pools;
- (4) India and Globalisation; and
- (5) India: Information Technology.

Each session had two discussants and they gave detailed comments. It was followed by discussion from the floor. The discussions emphasised the interdisciplinary nature of the issues. The conference volume was published by *Routledge* and was released during the 2009 conference. In addition to the academic sessions the conference also had a panel discussion on global business wherein representatives from industry presented the industry view point.

***First Annual Conference: Knowledge Based Industries, Employment and Global Competitiveness, (India International Centre, New Delhi, October 6 and 7, 2006)***

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We held our first Annual Conference at the India International Centre, New Delhi on October 6 and 7, 2006., New Delhi. The theme of the conference was ***Knowledge Based Industries, Employment and Global Competitiveness***. In all 52 delegates registered and participated in the conference. From outside India, papers were presented by scholars from the University of Antwerp, Belgium; United Nations University – UNU-MERIT, the Netherlands; Singapore National University, Singapore; Nagoya University, Japan; and Georgetown University, Washington DC, USA. The Indian participants came from numerous academic institutions – universities and research institutions, United Nation agencies, Ministry of Science and Technology and the institutions supported by the Department of Science and Technology, Economic Advisory Council – Prime Minister Secretariat, National Security Advisory Council, and industry associations like Confederation of Indian Industry.

In addition to the inaugural and valedictory sessions, the seminar had four technical sessions. The inaugural address was delivered by Professor Y K Alagh (former Minister of Science and Technology and former Vice Chancellor JNU). Professor P V Indiresan (former Director IIT Madras) gave the Chairperson’s address. The Valedictory Address was given by Dr. M R Srinivasan (Member, National Security Advisory Council, and former Chairman Atomic Energy Commission). In all 16 research papers were presented in the four technical sessions. The technical sessions covered the following four themes: competitiveness, employment, global comparisons and technology. In each session, paper presentations were followed by discussants’ detailed comments and then it was open to comments and observations from the floor. *Routledge* has published the papers presented in the conference and the volume has been released during the 2007 Annual Conference at IIT Bombay.

## Books

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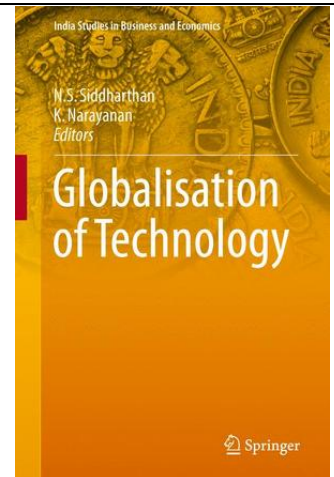
### 15. Globalisation of Technology

Springer (2017)

Editors: N.S. Siddharthan, K. Narayanan

ISBN: 978-981-10-5423-5

This book examines the globalisation of technology and innovation in the modern world. Enterprises globalise in several ways, e.g. by exporting, sourcing components and materials from other countries (B2B commerce), outsourcing, licensing their technologies and production, and foreign direct investments (FDI). Transaction costs and location advantages play a crucial role in selecting the best mode of globalisation. A number of important questions – like what are the pull and push factors contributing to FDI, does outward FDI from a developing country like India contribute to participation in international production networks, and does FDI mitigate business cycle co-movements – keep cropping up in the growing body of knowledge on the globalisation of technology. This book addresses these issues, as well as the consequences of FDI – in particular, with regard to technology, productivity, and R&D spillovers. Issues related to innovations, R&D, intra-industry trade, and knowledge management are also discussed.



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### 14. Technology: Corporate and Social Dimensions

Springer (2016)

Editors: N.S. Siddharthan, K. Narayanan (Eds.)

ISBN: 978-981-10-1683-7 (Print) 978-981-10-1684-4 (Online)

The Indian economy is considered to be one of the fastest growing economies of the world with India amongst the most important G-20 economies. Ever since the Indian economy made its presence felt on the global platform, the research community is now even more interested in studying and analyzing what India has to offer. This series aims to bring forth the latest studies and research about India from the areas of economics, business, and management science. The titles featured in this series will present rigorous empirical research, often accompanied by policy recommendations, evoke and evaluate various





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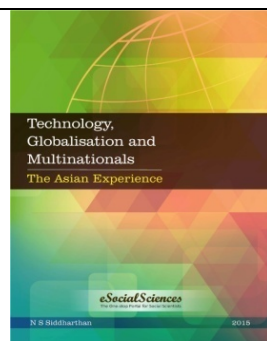
aspects of the economy and the business and management landscape in India, with a special focus on India's relationship with the world in terms of business and trade.

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### 13. Technology, Globalisation and Multinationals

eSocialSciences (2016)

N. S. Siddharthan



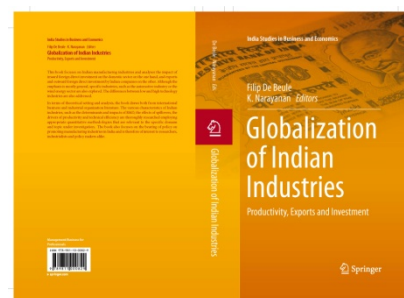
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### 12. Globalization of Indian Industries: Productivity, Exports and Investment

Springer, (2016)

Editors: De Beule, Filip, Narayanan, K. (Eds.)

**Abstract:** This book focuses on Indian manufacturing industries and analyses the impact of inward foreign direct investment on the domestic sector on the one hand, and exports and outward foreign direct investment by Indian companies on the other. Although the emphasis is mostly general, specific industries, such as the automotive industry or the wind energy sector are also explored. The differences between low and high technology industries are also addressed. In terms of theoretical setting and analysis, the book draws both from international business and industrial organization literature. The various characteristics of Indian industries, such as the determinants and impacts of R&D, the effects of spillovers, the drivers of productivity and technical efficiency are thoroughly researched employing appropriate quantitative methodologies that are relevant to the specific domain and topic under investigation. The book also focuses on the bearing of policy on promoting manufacturing industries in India and is therefore of interest to researchers, industrialists and policy makers alike.



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### 11. Innovation and Global Competitiveness: Case of India's Manufacturing Sector

Routledge, (2016)

Editors: N. S. Siddharthan and K. Narayanan



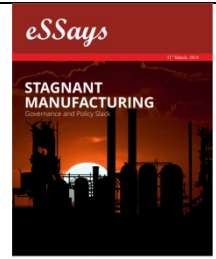
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## 10. Stagnant Manufacturing: Governance and Policy Slack

Published by IKF (IRIS Knowledge Foundation), Mumbai, India, jointly with Forum for Global Knowledge Sharing

Guest Editor: Prof N.S. Siddharthan

[E-book: March 2014 \(www.esocialsciences.org\)](http://www.esocialsciences.org)



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## 9. Innovation and global competitiveness: Case of India's Manufacturing Sector

Special issue of the Journal Innovation and Development, Routledge, 3(2), 2013

Guest editors: N S Siddharthan and K Narayanan

**Abstract:** The set of six papers published in this special issue were originally presented at the Seventh Annual Conference of the Forum for Global Knowledge sharing (Knowledge Forum <http://fgks.in>), held in Pune, November 2012. The six papers deal with several issues relating to this theme. The issues relate to:

- Role of R&D
- Mergers, acquisitions and technological efforts
- Technological determinants of competitive advantages
- The role of Small and Medium Enterprises and regional patterns
- Technological efforts and global operations
- Role of industrial clusters in promoting innovation and competitiveness

The papers included in this issue cover pharmaceuticals (2 papers), automobile sector (2 papers), industrial machinery (1 paper), and regional innovation systems and small and medium firms.



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## 8. Human Capital and Development: The Indian Experience

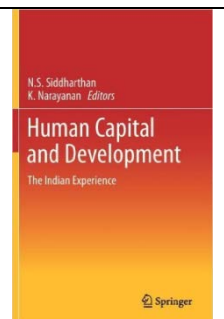
Springer, 2013, i-ix, 1-155

Editors: N S Siddharthan and K Narayanan

Select papers from the Annual Conference, hosted by IIT Bombay, November 11-12, 2010

**Abstract:** The theme “Human Capital and Development” has several dimensions and the papers included in the volume covers several dimensions and discuss the following aspects:

- Knowledge revolution and the changing role of skilled workforce
- Skill biased technological change and job destruction of



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low-skilled workers

- Human resource, labour productivity and employment
- Foreign direct investment and human resources
- Human capital, energy use and environment
- Human capital and antipoverty programmes
- Government and efficiency of educational institutions

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## 7. Agglomeration, Technology Clusters and Networks

Special issue of the journal, “Science, Technology and Society”, 17(3), 2012

Guest Editors: Ashok Jain, K Narayanan and N S Siddharthan

Select papers from the Sixth Annual Conference hosted by the Goa University, November 18-20, 2011

**Abstract:** Papers included in this issue extend literature in this area by analysing new aspects hitherto neglected by earlier studies.

- Changing patterns and behaviour of outward foreign direct investments in Europe by Chinese and Indian enterprises.
- The choice of location of Indian and Chinese enterprises in Europe, their motivating factors, cluster advantages and other emerging issues.
- Technology clusters and in-house R&D behaviour of enterprises.
- Agglomeration and labour markets
- Agglomeration and wellbeing of people



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## 6. Innovation and Enterprise Development

Special issue of the journal “Science, Technology and Society”, 18(3), 2011

Guest Editors: N S Siddharthan and S R Hashim

Select papers from the conference held at the Madras School of Economics on Frontier Issues in Technology, Development and Environment, March 19-21, 2010

**Abstract:** The papers included in the special issue deal with the following issues:

- Impact of trade liberalisation on the efficiency of firms. First paper of this volume discusses this issue for a sample of Vietnam firms. The study is of interest and has lessons for other countries, as the sample firms are small and medium sized and Vietnam had followed a very different trade policy before the current globalisation era
- Despite serious disadvantages, firms from developing countries have been successful in exports and have held



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their own in the world market. Two papers included in the volume deal with this issue, the first one with the recently emerged Indian software sector and the second with the more traditional chemical sector. Furthermore, both the papers relate productivity to exports

- Environmental regulations of the developed countries have been acting as a major non-tariff barrier for exports. In particular, they have been affecting the exports of chemical industries. What has been the impact of environmental regulations on the technical efficiency of firms, and in particular, do firms that have been adhering to environmental regulations improve their technical efficiency or get worse, are the questions attempted to be answered
- The current era is also characterised by energy crisis and there are environmental and market pressures to deploy technologies that conserve and save energy. What determines the energy intensity of manufacturing, and what are the effects of energy prices and technology in motivating firms to reduce energy intensity are questions which have been reflected upon
- Technology plays a central role in the productive efficiency and competitiveness of enterprises. In this context, it is important to find out the technology strategies of small and medium firms: what determines their R&D activities? How do they cope?

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**5. Contributions to Indian Social Science, IASSI Quarterly, 29 (3&4), 2010**

Guest Editor: N S Siddharthan

Select papers from the conference held at the Madras School of Economics on Frontier Issues in Technology, Development and Environment, March 19-21, 2010



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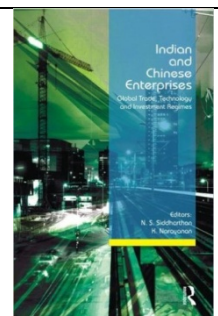
**4. Indian and Chinese Enterprises: Global trade, Technology and Investment Regimes, 2010**

Routledge, New Delhi and London.

Editors: N. S. Siddharthan and K. Narayanan

Select papers from 2007 Annual Conference of the Forum for Global Knowledge Sharing held at IIT Bombay

**Abstract:** While much has been said and written about their high GDP growth rates, not enough attention has been paid to the globalisation of Indian and Chinese enterprises. Operating in high-technology industries like IT, automobiles, electronics, bio-technology and pharmaceuticals, Indian and Chinese enterprises have succeeded in networking with



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international firms and have established equity as well as non-equity strategic alliances with them. They have been acquiring foreign enterprises as well as investing abroad and launching joint ventures with foreign firms. Several of the small and medium enterprises have also successfully globalised using IT tools like business-to-business commerce. Additionally, the significant strides in science and technology made by these two countries have resulted in R&D work being outsourced to them by foreign firms. In order to analyse the issues thrown up by these developments, this volume employs a multidisciplinary and eclectic approach, bringing together scholars from different countries and disciplines—from economics and business management to science and technology. The articles discuss a host of issues, including the international institutional and environmental background within which these firms have to globalise; the respective Indian and Chinese industrial scenes; their IT software sectors; the internationalisation of R&D activities and foreign capital inflows. While the specific trajectories taken by these two globalising economies are markedly different, there is a strong belief that, taken together, the emerging economies of China and India will take up the slack in international demand and provide an alternative growth pole for the world.

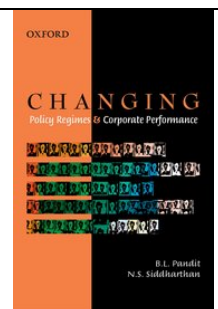
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### 3. Changing Policy Regimes and Corporate Performance, 2009

Oxford University Press, New Delhi, i-ix. 1-221

B. L. Pandit and N. S. Siddharthan

**Abstract:** Greater competitiveness and easy access to new technology and markets—the results of economic reforms—are ingredients for accelerating growth. This volume chronicles the sequence of reforms starting from deregulating measures in the mid-1980s to the economic reforms of the 1990s and the impact these regimes had on corporate challenges and their performance in India. Looking at the private sector, the book focuses on inter firm analysis of variations in foreign direct investment, spillovers from multinational investments, R&D and technology acquisition, growth and employment, and foreign portfolio investment. In an industry consisting of a variety of firms that differ in terms of their access to technology, knowledge, and other intangible assets, the volume assesses the impact of liberalization on productivity gaps of enterprises.



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## 2. High Tech Industries, Employment and Global Competitiveness, 2008

Routledge, London, New Yoark and New Delhi, i-xi, 1-268.

Editors: S. R. Hashim and N. S. Siddharthan

Select papers from 2006 Annual Conference of the Forum for Global Knowledge Sharing held at India International Centre, New Delhi

**Abstract:** High-tech, knowledge-based industries like information technology, biotechnology, and pharmaceuticals have played an important role in the transition of the Indian and Chinese economies—the two largest and fastest developing economies in the world today. This process has been characteristically marked by the expanding reach of multinational enterprises, flows of foreign direct investment, unprecedented advancement of information and communication technologies (ICT) and knowledge-based industries, and infusion of ICT across the entire spectrum of industries and activities. This interdisciplinary book offers an in-depth understanding of the behaviour of firms in these industries, analysing the strategies they adopt in a globally competitive environment, the role they have played in ushering in the growth revolution in China and India, and the contribution they have made to the nature and growth of employment. Based mostly on data collected through fieldwork and surveys, it discusses the emerging nature of scientific and technological developments like nanotechnology, novel materials, spintronics, and quantum computers, suggesting that in the future, knowledge and technology will become the real sources of wealth for nations.



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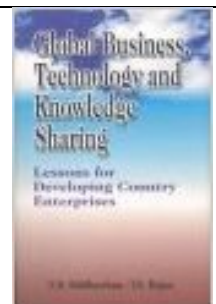
## 1. Global Business, Technology and Knowledge Sharing: Lessons for Developing Country Enterprises, 2002

Macmillan, New Delhi, i-xvii, 1-217

N. S. Siddharthan and Y. S. Rajan

**Abstract:** Within the expanse of nine chapters, the book discusses the following issues:

- The importance of technology intermediation in facilitating knowledge sharing and commercialisation of technology
- The kind of FDI that countries like India are likely to attract in the WTO regime, namely, market seeking or efficiency seeking investments
- The role of FDI in R&D – its consequences for technological capabilities of these countries



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- The relationship between technological imports and in-house R&D activities – are they substitutes or complementary
  - Technology acquisition and performance of enterprises – growth and exports
  - The role of new technologies such as IT in improving the competitiveness of small and medium enterprises
  - In discussing these issues, the book examines evidence from literature and in particular, research studies conducted for less developed countries. It also presents several Indian case studies
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