Harnessing ICT for catching up
A development cooperation agenda from innovation system perspective

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The context: ICT and development

- ICT - the greatest contribution in the sphere of technology by the previous century to the present century and beyond
- As a GPT - there is hardly any area wherein ICT cannot have its influence – presence of southern countries.
- By reducing the transaction cost to the minimum level IT has been instrumental in enhancing international competitiveness
- There is hardly any country that has not adapted policies to harness ICT
- But there are sharp divides in the digital world order and that ICT induced development is confined to the developed countries
- Also there is a digital threat to development

The context: ICT and development

- Direct benefits
  - Through the production of ICT goods and services
- Indirect benefits
  - ICT induced productivity and competitiveness through its diffusion

The context: ICT and development

- The focus of discussion however, has been on promoting ICT use
- Developing countries only needs to adopt as both H/W and s/w are available at falling cost
- ITA of WTO
- Being a GPT capabilities needs to be built up at different levels
- The developing countries can afford to be passive adopters of technology only at a high cost of perpetuating technological dependence
- Take the case of green revolution- where in developing countries were not simply adopters of technology

The context: ICT and development

- ICT production is a source of income and employment in many developed countries
- In the US IT industries accounted for about 8.3 percent of the GDP and nearly a third of GDP growth since mid 1990s.
- Experience of South East Asian Countries
- True, there are high entry barriers for developing countries to enter IT production;
- Yet, given the large number of products involving different levels of technology the countries in the south also could enter into ICT production

The context: ICT and development

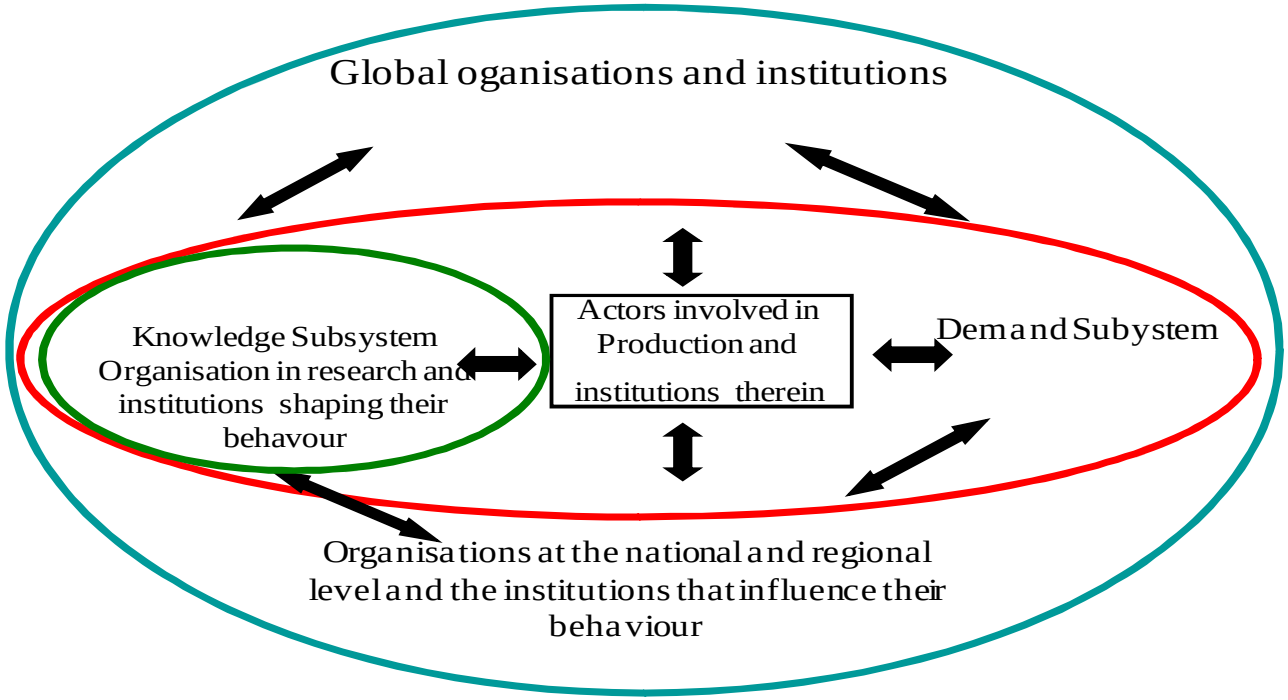
- New Challenges
- Trade liberalization – limited scope for infant industry protection
- New IPR regime – limited scope for duplicative imitation
- National treatment for FDI – reduced policy space for influencing MNCs and technology transfers and spillovers
- Fiscal prudence – reduced social sector investment including education
- Opening up - Large domestic market became irrelevant
- Withdrawal of state & greater reliance on market – short run profit oriented investment decisions
- Multilateral organizations powerful in influencing domestic policies

- While trade has been viewed, in some quarters, as an engine of growth, it is worthwhile to quote Lewis here. “ ....the engine of growth should be technological change with international trade serving as lubricating oil and not as fuel”. He continued “….those who depend on it as their major hope are doomed to frustration” (Lewis 1978).

Two issues

- Will ICT fall from heaven like Manna??
- Innovation system does matter
- What can we learned from India?

Innovation System and ICT



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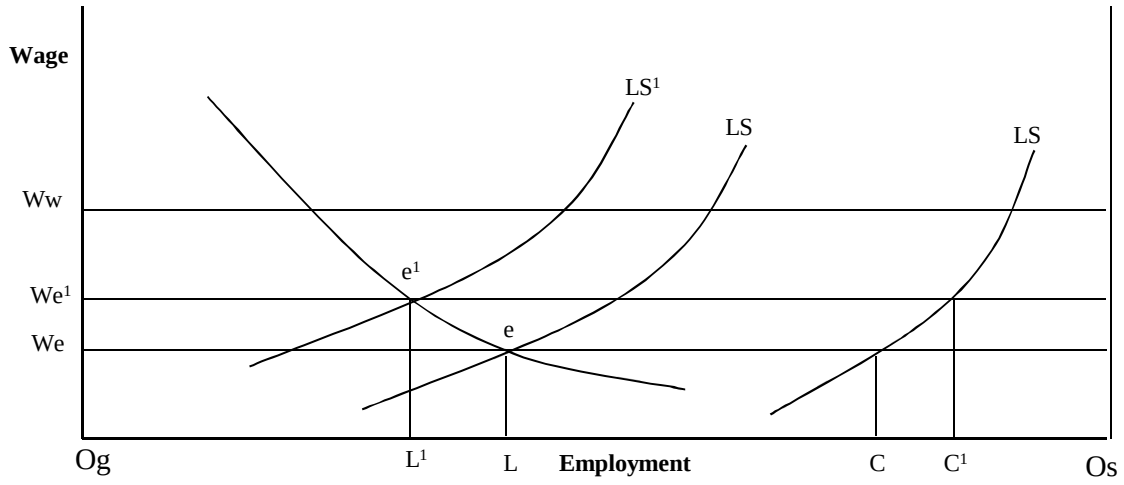
- **Indian experience: from innovation system perspective**
- Remarkable performance in export

Year	Software production ($ Mill)	Annual growth rate (%)	Exports ($ Million)	Annual growth rate (%)
1990-91	209		110	
1991-92	289	38.3	166	50.9
1992-93	382	32.2	221	33.1
1993-94	545	42.7	325	47.1
1994-95	803	47.3	473	45.5
1995-96	1182	47.2	711	50.3
1996-97	1798	52.1	1159	63
1997-98	2929	62.9	1813	56.4
1998-99	4009	36.9	2599	43.4
1999-00	5538	38.1	3962	52.4
ACGR 1991-99		44.2		49.1
2000-01	8021	44.8	5978	50.9
2001-02	9931	23.8	7653	28
2002-03	12376	24.6	9607	25.5
2003-04	16141	30.4	12608	31.2
2004-05	21587	33.7	17216	36.5
2005-06	30404	40.8	23718	37.8
2006-07	42312	39.2	33757	42.3
2007-08	55144	30.3	43467	28.8
2008-09	61984	12.4	49540	14
2009-10	64956	4.8	51001	2.9
2010-11	74890	15.3	57616	13
Average growth 2000-10		35.3		38.2

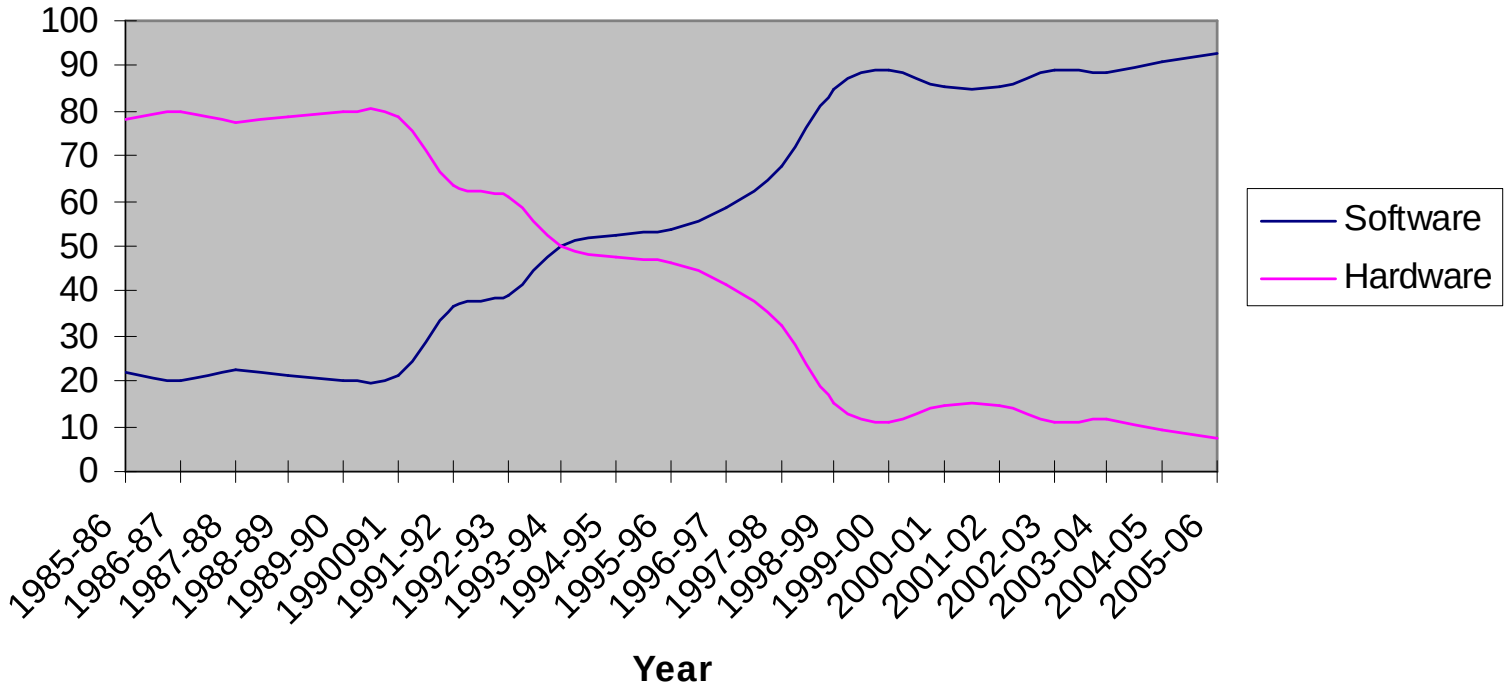
Opportunity cost of exports

Fig 5: Effect of IT Boom on the Labour Market



Lagging hardware sector

Fig 2: Share of Software and Hardware in IT Exports



Moving up or down the value chain?

- In the early years Indian firms were found operating mostly at the lower end of value chain by carrying out low-level design, coding and maintenance
- revenue per employee in 1999 is found to be only about one-tenth of Israel and one-fourth of Ireland
- the net export earning has been only of the order of 50 per cent of the gross FOB value of total exports
- Now there are indications in both directions

Moving down – Growth of IT Enabled Services

- ITES in total software and service exports increased from about 14 per cent 2000 to 25 percent at present
- While software industry in India is shown to have led to an enclave type development, the ITES is found geographically diffused across different regions
- While employment in the software sector has been mainly for the highly skilled IT professionals, the ITES sector generates more broad based employment including the arts and science graduates
- It is also found that ITES sector is more employment intensive with employment per million dollars of exports as high as 70, which is more than twice that of the software sector

Moving up the value chain: select indicators

- With the MNCs looking for complementary capabilities, Indian firms are getting engaged in highly skill intensive areas like, embedded s/w, chip design and R&D and thus are moving up the value chain
- Also higher growth in revenue per employee
- Evidence from ICTC (index of claimed technological competence)
- Widening domain expertise and applications from year 2k projects to wide range of projects requiring higher levels of expertise and also to s/w products
- International quality accreditation : In 2008-09 among the 401 firms that reported different international quality standards 82 had SEI CMM level 5, the highest level of quality accreditation
- This accounted for more than 2./3 of such firms in the world
- Shift from onsite to offshore (see graph)

Home grown success and the emergence of IT MNCS from India

- Tata Consultancy Services had been exporting software since 1974
- The entry of Citicorp Overseas Software Ltd. (COSL) in Bombay in 1985 and of Texas Instruments (TI) in Bangalore in 1986 for software development highlighted India's potential to outside MNEs
- Subsequently, a number of other western corporations began to follow the footsteps of COSL and TI, such as HP in 1989 and followed by Novell, Oracle, among others
- Today all the leading firms have their presence in India
- Yet even in 2012 MNEs do not figure among the top six software companies in India, ranked either on the basis of overall sales or the exports. Among the top twenty software companies too, no more than four are MNE affiliates or joint ventures.
- OFDI from India and other countries in the south

Growing domestic market orientation

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Year	Domestic ($ Mill)	Annual growth rate (%)	Domestic market share in production (%)
1990-91	99		47.37
1991-92	123	24.2	42.56
1992-93	161	30.9	42.15
1993-94	222	37.9	40.73
1994-95	330	48.6	41.1
1995-96	471	42.7	39.85
1996-97	724	53.7	40.27
1997-98	1150	58.8	39.26
1998-99	1379	19.9	34.4
1999-00	1537	11.5	27.75
Decadal growth		36.5	
2000-01	2043	32.9	25.47
2001-02	2278	11.5	22.94
2002-03	2769	21.6	22.37
2003-04	3533	27.6	21.89
2004-05	4371	23.7	20.25
2005-06	6686	53	21.99
2006-07	8555	28	20.22
2007-08	11677	36.5	21.17
2008-09	12444	6.6	20.08
2009-10	13955	12.1	21.48
2010-11	17274	23.8	23.07
Average growth 2000-10		30.6	

Rising domestic market

- National policies: UID $ 3.59 Billion project
- Regional policies
- Pvt sector initiatives
- ICT and productivity

Innovations addressing LDC problems

- Last mile connectivity (CoreDECT) wireless in local loop
- Affordability & illiteracy (simputer; Aakash)
- South –south cooperation – Southerrn multi nationals

Global Cooperation :Innovation system perspective

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GC: 10 stylized facts

- While NSC has a longer history, SSSC had its genesis in 1960s when developing countries had much more poverty than prosperity to share
- Yet SSC thrived through 1960s and 1970s thanks to the charismatic political leader ship in the South along with the institutional support from multilateral organizations like UNCTAD that spearheaded the cause of development in the South on the one hand intellectual support provided by economists of eminence like (Prebisch 1959)
- 3. On account of a host of factors, both exogenous and endogenous to the developing world, SSC is said to have had a setback during 1980s and early 1990s (Kumar 2008).
- 4. SSC regained momentum with some of the developing countries mastered the art of achieving high growth and accumulated financial resources (Aggarwal 2012) and technological capabilities in some of the key emerging areas of relevance to development and (Joseph 2005; Ojo et al 2008) and engines of global growth and multilateral organization like UNDP UNIDO and others joining the bandwagon.

GC: 10 stylized facts

- South-South trade and investment along with technology sharing and development cooperation have been growing at an unprecedented rate which has been considered as an indicator of harnessing southern capabilities for addressing southern development problems
- The proliferation of bilateral investment treaties (47 in 1990 to 603 in 2004), double taxation avoidance treaties and various types of PTAs along with trilateral cooperation arrangements involving investment and proviso for sharing development lessons acted as facilitators
- The development assistance from the South, led by emerging powers, also has been growing at an unprecedented rate - the total assistance doubled in a short period of three years to reach $17 billion.
- Difference in the form content as well as the institutional architecture for NSC vs SSSC. The rising powers perceive the traditional Western concept of aid as a vertical, paternalistic relationship that undermines the potential for self reliant development. The southern providers focus on mutual gains while promoting the emancipation of fellow developing countries (Fues et al 2012) and has little, if any, policy conditionalities compared with aid provided by Northern donors. and

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10 stylized fcats

- Given the increasing role of emerging economies , SSC activism has been perceived as a threat to the dominance of traditional donors (Chahoud 2007) and that prominent venues for dialogue between traditional and emerging donors have been established. OECD's Development Assistance Forum (DAF) and the UN Development Cooperation Forum (DCF).
- Analyzing the issue from a broader global governance paradigm, recent studies have called for traditional and southern providers to jointly develop new principles and operational frameworks oriented towards the priorities and needs of their partner countries (Fues et al 2012).
- To say the least, thanks to the growing number of scholarly studies and active interest shown by the multilateral organizations and other stakeholders involved in SSC today we are much better informed about the counters of development cooperation. Yet to help informed policy making there remain a number of issues on which our understanding remain at best rudimentary and therefore calls for more theoretically informed empirical investigations.

On SSC in ICT

India's bilateral agreements with over 30 countries in the area of e government, computerization of government offices, and FDI in software industries of countries such as Sri Lanka, Mauritius, Vietnam, and Senegal. India has also been involved in trilateral relationships with Mexico and Venezuela.

- South Africa plays a prominent role in a few major regional economic frameworks such as the Southern African Development Community (SADC), Common Market for Eastern and Southern Africa (COMESA) and the African Information Society Initiative (AISI). These regional initiatives involve cooperation in the area of e-applications (such as e-learning and e-government).
- China has supported several developing countries through its technology cooperation programme, largely in the form of training. China also has some 130 technical cooperation agreements including SSC in science and technology with major players in the north, particularly the EU and the US.

SSC in ICT

- Brazil, as a member of Economic Commission of Latin America and the Caribbean, is involved in the development of regional information systems with other members.
- The India-Brazil-South Africa (IBSA) Economic Cooperation agreement includes: (i) facilitation of trade among the three countries, (ii) sharing of experience in the field of e-governance and (iii) mutually strengthening capabilities in free and open source software.
- E-ASEAN Agreement
- Call for a e-South framework Agreement

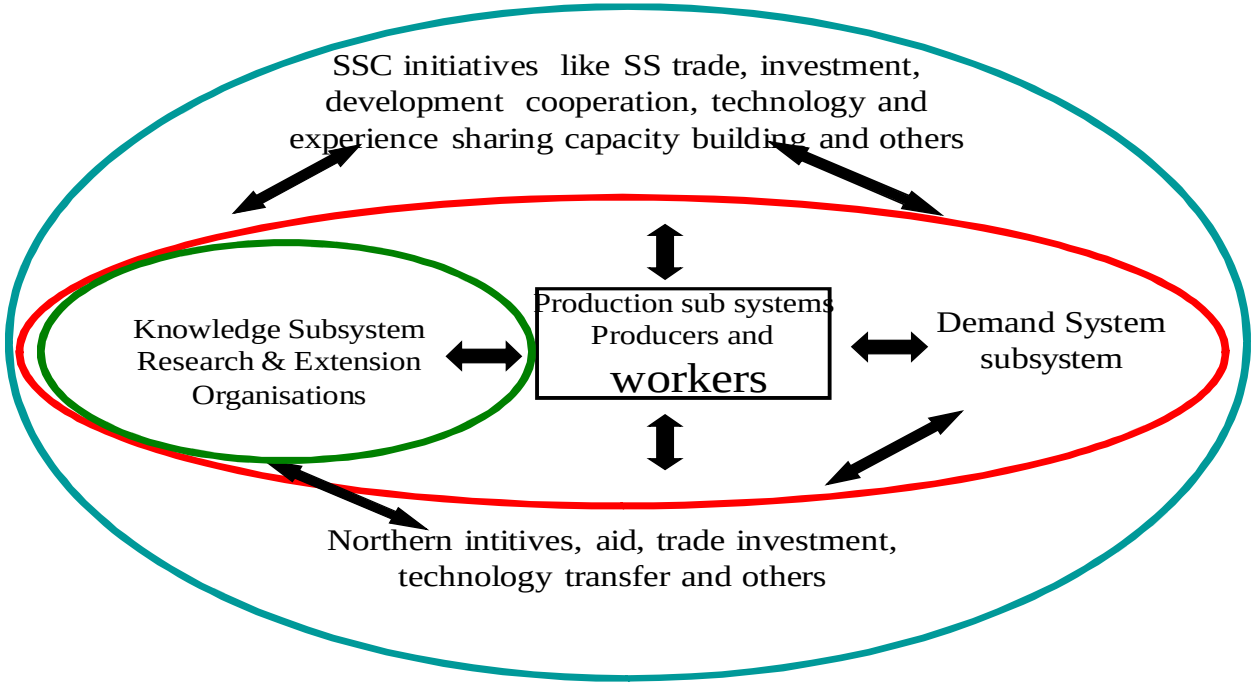
Some issues

- Countries neither cooperate nor compete; but the actors across countries do. Hence, the discourse at the country level on development cooperation conceals more than what is revealed and therefore to provide clearer answers to often raised issues like whether SSC is a substitute to NSC, there is the need for better understanding of the micro level realities.
- if growing SS trade and investment could be viewed as SSC for growth and development?
- quantitative increase in FDI regardless of its source also cannot be treated blindly as an indicator of development. Quality of FDI does matter (Kumar 2002).
- Hence, along the growing concern about effectiveness of aid and investment from North, the effectiveness of south-south investment, technology sharing and development cooperation also needs scritiny

Some issues

- While SS FDI is laudable, in a context wherein low labour cost is taken for granted, the ability of the developing countries to attract FDI, regardless of its source is governed by their ability to provide certain specialized capabilities that the TNCs need in order to complement their own core competence (Lall 2001, Ernst and Lundvall 2000).
- These capabilities are manifested *inter alia* in the learning, innovation and competence building systems or more precisely the “systems of innovation” present in the developing countries.
- Key issue is to what extent SSC Vs NSC help building up a vibrant innovation system in the recipient countries? Innovation system approach leaves room for inquiry at the national, regional or at the sectoral level.
- Hence, yet another dimension of effectiveness of SSC is to explore whether such initiatives help building an inclusion and sustainability (economic, environmental and social) oriented innovation system?

Innovation system in the context of development cooperation



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IS and development cooperation

- Effectiveness of development cooperation, could be analysed in terms of the extent to which they help strengthening the learning, innovation and competence building process.
- This could be understood in terms of its bearing on the knowledge sub system, production sub system, the demand sub system or in their combination.
- Trade and investment could be termed as involving development cooperation if and only if it facilitates strengthening the system of innovation and production.
- Further, the framework would also help exploring if such cooperation and the interaction that entails between different agents, facilitates sustainable (and inclusive) development by addressing the existing spaces exclusion or aggravating it.

- Thank you