

India in Global ICT Value Chains: Achievements and Limits

*K J Joseph, Ministry of Commerce Chair
Centre for Development Studies*

The Context

- Innovations in ICT is perhaps the greatest contribution in the in the sphere of technology by the previous century to the present century and beyond
- UNCTAD, among others, has highlighted how ICTs could foster more inclusive development along with contributing to productivity and international competitiveness
- It has also been argued that being a general purpose technology, harnessing ICT for development presupposes the development of capabilities in
- both hardware and software AND
- in the sphere of production and use

The Issues

- India's experience in integrating with ICT Global Value Chain has often been considered as inspirational for other developing countries
- But the key issue is with respect her performance in software vis-à-vis hardware (electronics) and in production vis-a-vis use.
- It is instructive also to compare India's performance with that of China
- The issue assumes importance because a lop sided approach, it has been argued, has the potential danger of perpetuating technological dependence and accentuating polarization among counties

Software sector opportunities

- Low capital barriers to entry
- Generator of employment – not least for the skilled youth
 - India: IT-BPO employed some 2.6 Million in 2011
- Source of innovation
 - India: 400+ new software product companies since 2001
- Source of export revenue
 - India: Software and BPO services exports of \$58 billion in 2010/11
- Key to sustain productive ICT use in society

Hardware sector opportunities

- Electronics production is a major source of employment and income in developed countries
- For example, in 2010, ICT industries employed 5.8 per cent of workers in OECD economies recording a 13 per cent increase since 1995.
- Production of IT goods has been a major source of output, exports and job creation even in countries like South Korea, Singapore, Thailand, Malaysia and others.
- Industry segments like microprocessors are almost closed because standards are set by the leading US based firms like Intel.
- Moreover most segments of IT industry are highly capital intensive and scale intensive and require specialized skills that only a few countries can hope to achieve
- Yet, being a multi-product industry with vary levels of capital intensity and technology, the doors are not firmly closed for developing countries.

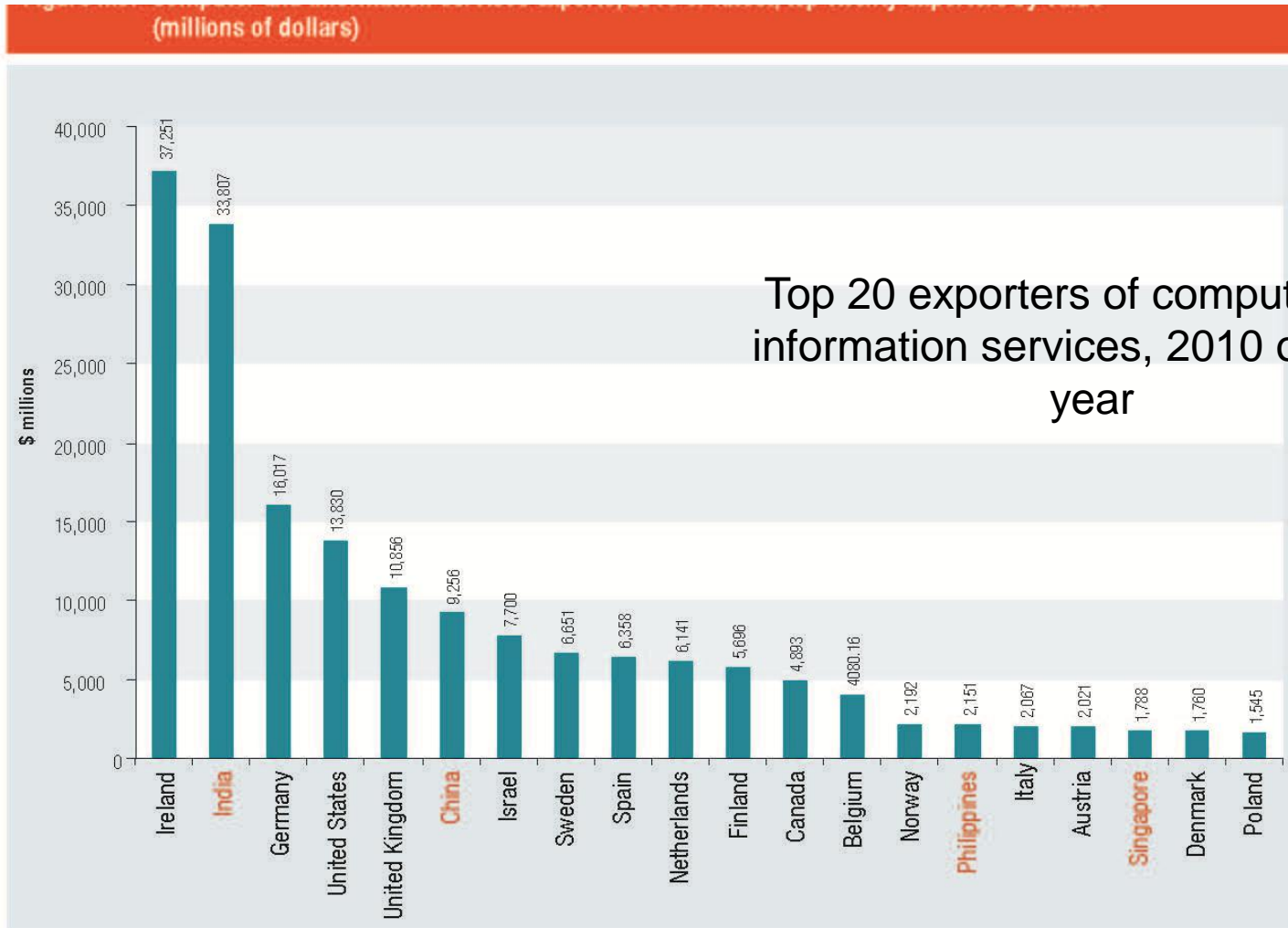
- India is Global software value chain

Trend in Software Production and Exports: Unprecedented- but global crisis had its impact

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
Decadal growth		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

Yet India tops software exports from the South

Followed by China, Philippines and Singapore



- Top developing country recipient of greenfield FDI projects in software
- Top developing country recipient of venture capital projects related to software
- With 83 projects valued at \$ 1662 Million during 2008-11, India emerged as the leader among emerging economies
- India accounted for about 59 per cent of global outsourcing of software services in 2010 where as the share of China is only 4% and that of Philipines one per cent
- Tata Consultancy, Wipro and Infosys among top 15 IT services companies in the world

Contribution of software to India's GDP and export earning is substantial

Year	% of GDP	% of Service GDP	% of total exports	% of Service exports
2000-01	1.85	6.48	7.73	18.61
2006-07	4.63	16.76	13.27	28.23
2007-08	4.85	17.55	13.82	29.26
2008-09	5.37	18.40	13.99	29.57
2009-10	5.06	16.68	14.77	31.24
2010-11	4.77	15.57	12.86	29.09

Employment in the software sector

- According to NASSCOM Strategic Review (2012), the direct employment generated by the software industry (software services, products, BPO and hardware) is estimated at 2600,000 in 2011 as compared to 160,000 in 1996.
- It is also estimated that the indirect employment is about four times the direct employment.
- The industry is creating job opportunities for highly qualified (majority with an engineering degree) young graduates with a relatively short experience.
- With the growth in BPO employment has become more broad based

While MNCs are holding the commanding heights in H/W, domestic firms leads the software sector

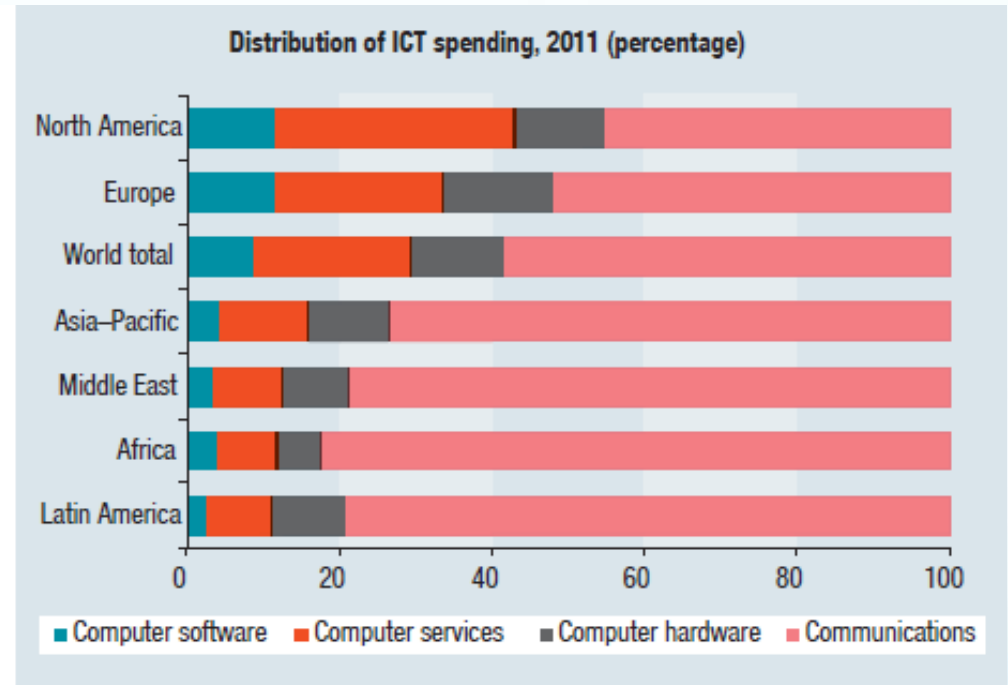
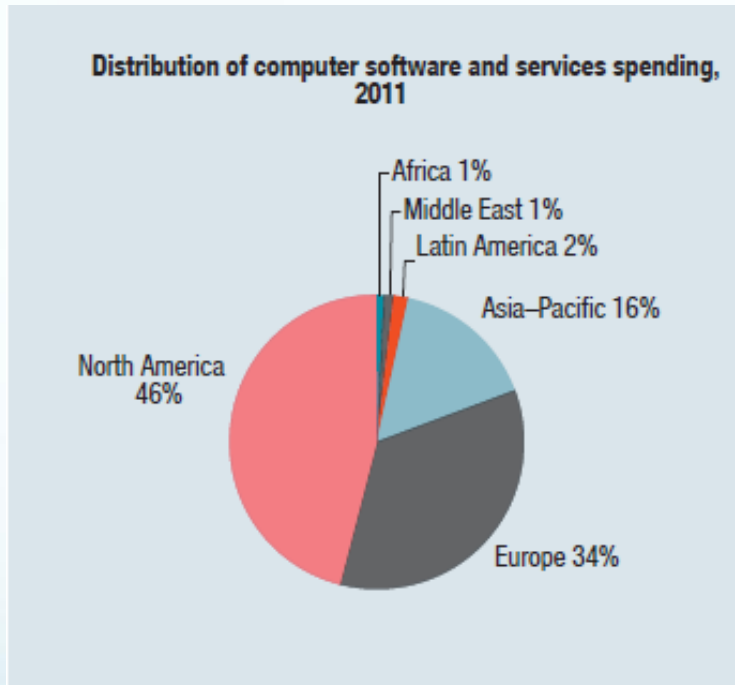
Company Name	Export US \$ Mill	Website
Tata Consultancy Services ltd	5119.94	www.tcs.com
Infosys BPO Ltd	4456.37	www.infosys.com
Wipro ltd	3516.23	www.wipro.com
Cognizant Technology Solutions India pvt ltd	3284.36	www.cognizant.com
HCL Technologies	2129.85	www.hcltech.com/
IBM India Pvt Ltd	1357.93	www.ibm.com
Accenture Services Pvt Ltd	940.98	www.accenture.com
Tech Mahindra Ltd	905.78	www.techmahindra.com
Mphasis ltd	816.61	www.mphasis.com
Patni Computer Systems Ltd	624.16	www.ibm.com/contact/in/en

Shift from services to products: Moving up the value chain?

Year	Domestic sales of software \$ billion	Share of		Export of software \$ billion	Share of	
		Software services	Software products and ER&D		Software services	Software products and ER&D
2005	4.2	83.33	16.67	13.1	76.34	23.66
2006	5.81	77.11	22.89	17.31	76.89	23.11
2007	7.13	77.56	22.44	21.99	77.54	22.46
2008	10.11	77.94	22.06	30.5	72.79	27.21
2009	10.92	75.37	24.63	35.4	72.88	27.12
2010	12.03	75.39	24.61	37.29	73.18	26.82
2011	14.49	75.91	24.09	44.84	74.60	25.40

- BUT, like other developing countries India's performance with respect to domestic use of software is not remarkable

Developing Countries spend little on Software



India: Computer software and services spending 2011: \$8.4 billion
As a share of total ICT spending: 8.7% -- *relatively low*

Weak domestic market orientation?

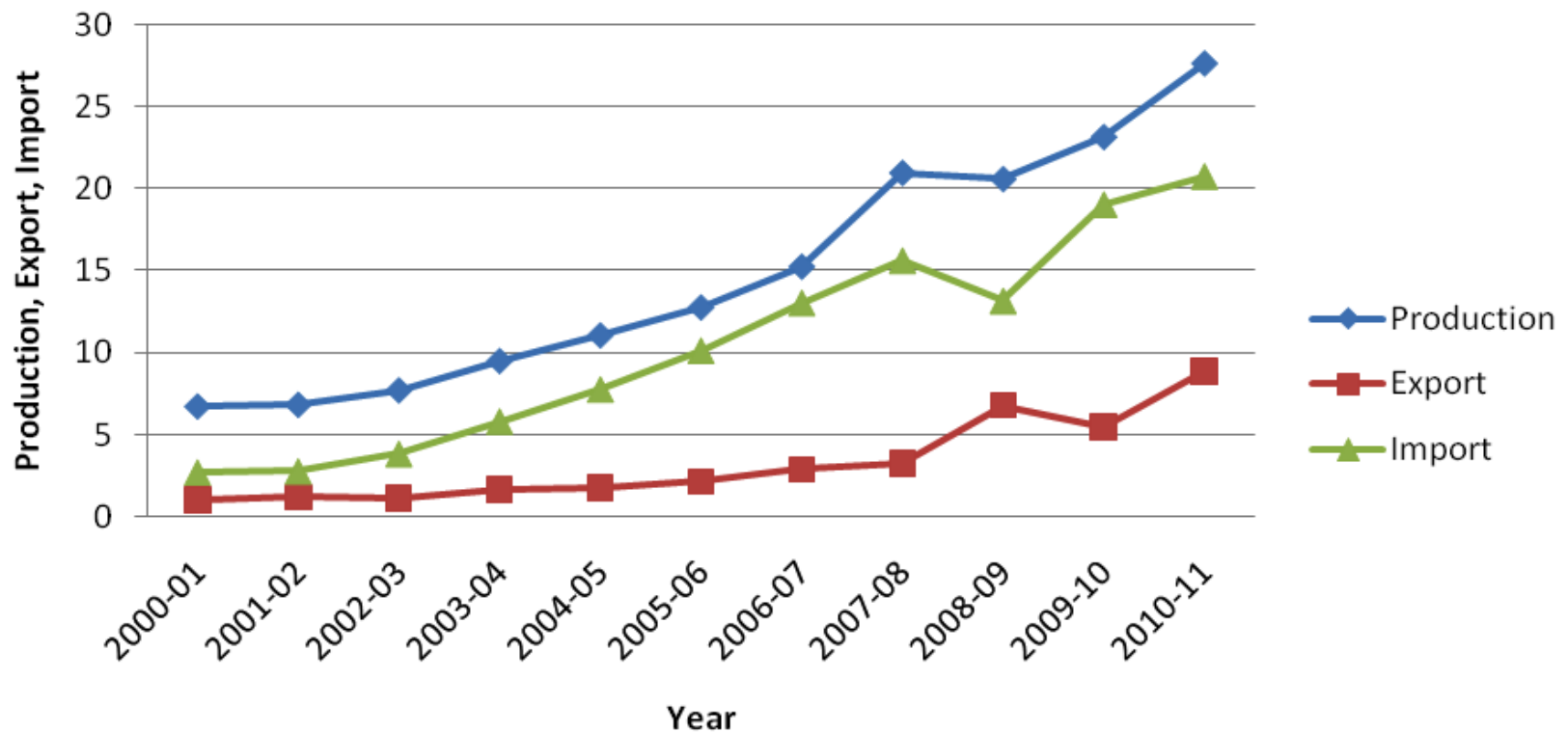
Year	Domestic Sales (\$ Mill)	Annual growth rate (%)	Domestic market share in production (%)
1990-91	99		47.37
1991-92	123	24.2	42.56
1992-93	161	30.9	42.15
1993-94	222	37.9	40.73
1994-95	330	48.6	41.1
1995-96	471	42.7	39.85
1996-97	724	53.7	40.27
1997-98	1150	58.8	39.26
1998-99	1379	19.9	34.4
1999-00	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	

- It has also been argued that the export oriented software production has had significant opportunity cost
- India's poor performance in the manufacturing sector, in a sense, cannot be delinked from the resource movement effect associated with software export boom

- Performance of hardware/Electronics

The weak link: lagging electronics production

Fig 1: Trend in Production, Export and Import of Electronics in India



**Lagging Domestic production base of electronics:
Decline in domestic availability ratio**

Year	Export (\$ Billion)	Import (\$ Billion)	Production (\$ Billion)	Domestic Availability Ratio
1990	0.21	0.83	5.11	0.89
1991	0.2	0.56	3.95	0.92
1992	0.2	0.77	3.71	0.87
1993	0.26	0.72	4.15	0.90
1994	0.34	1	4.92	0.88
1995	0.57	1.44	5.20	0.86
1996	0.69	1.22	5.51	0.91
1997	0.56	1.79	5.83	0.83
1998	0.32	1.91	5.89	0.79
1999	0.4	2.39	6.40	0.76
2000	0.54	2.98	6.77	0.74
2001	0.78	3.04	6.75	0.75
2002	0.81	4.14	7.61	0.70
2003	0.99	6.23	9.29	0.64
2004	1.28	8.31	11.08	0.61
2005	1.46	10.97	12.31	0.56
2006	1.88	14.08	14.22	0.54
2007	2.25	17.1	20.97	0.59
2008	2.99	14.9	20.59	0.63
2009	6.65	21.11	23.18	0.62
2010	5.8	23.51	27.61	0.61
2011	8.08	29.2	29.85	0.59
2012	7.17	28.64	32.87	0.60

- Comparison with China

Trend in the production and export of software in China – greater focus on domestic market enabled china to be globally competitive in other sectors

(\$ million)

Year	Total	Domestic	Export	Export as % of production
1990	5006	4754	254	5.07%
2000	6772	6373	399	5.89%
2001	8883	8167	726	8.17%
2002	13360	11860	1506	11.27%
2003	18116	16304	1812	10.00%
2004	29060	26260	2800	9.64%
2005	48400	44810	3590	7.42%
2006	64000	57940	6060	9.47%
2007	77009	67413	9596	12.46%
2008	109050	94736	14314	13.13%
2009	145931	126331	19600	13.43%
2010	197415	171761	25654	12.99%
2011	285900	255500	30400	10.63%
AGCR	44.4	43.6	54.5	%

China's electronics industry: Output and employment

Year	No. of Units	Output (\$ Billions)	Employment (Mill)
2006	9709	418.69	5.05
2007	11220	516.09	5.87
2008	14347	636.26	6.77
2009	14284	655.3	6.63
2010	14836	820.44	7.73

Towards a perspective

- India needs to promote domestic use of software which *inter alia* involves
- Developing a strategy that seeks to balance exports and domestic sales...
- Public procurement as strategic tool to create local demand
 - Make use of FOSS where feasible
- Foster greater interaction between local software industry and other sectors of the economy to develop relevant local applications
- Strengthening legal framework
 - IPRs, e-payment, e-transactions

Towards a perspective

- With respect to hardware India needs to enhance substantially its domestic production base where strategic acquisition through OFDI coupled with protection under ITA along with
- Proactive policies for the growth of a scale intensive, high velocity low margin industry has to be evolved
- Perhaps the relevance of an e-south Framework Agreement to foster learning Innovation and Competence building by focusing on both production and use of hardware and software is more relevant today than ever before

Thank you