Who needs a "Knowledge Economy": Information, Knowledge and Flexible Labour

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Middle income developing countries like India are seen as capable of exploiting the knowledge revolution and emerging as "knowledge economies", if they adopt the "appropriate" policies. However, whatever be the measure adopted of India's progress towards a knowledge economy, the goalpost is not even in sight. If yet this potential is being emphasised and supportive policies are being advocated merely based on the success of enclave-type growth in the IT sector, it is because the argument can be used to justify economic policies, especially labour market policies, which are clearly inappropriate.

Terms such as the "information revolution" and "information society" have been in vogue for more than two decades now, used often to emphasise the transformative effect of the arrival and diffusion of microelectronic devices and technologies. The argument was that through the growth of the information and communication technology (ICT) industry itself, through its horizontal expansion as a result of the introduction of new products such as mobile devices, and through its impact on sectors outside the ICT industry, involving the automation of both managerial and production tasks, the new technology was transforming economic activity.

More recently, however, terms such as the "new economy" and the "knowledge economy" are increasingly in use, implying that a range of developments, including of course the ICT revolution, necessitate a paradigmatic shift in our understanding of how economic mechanisms and economic systems work, with attendant implications for policy.

Thus the late 1990s long boom in the US, which combined high GDP growth, low unemployment, low inflation and a surplus on the government's budget, provided the basis for "new economy" theorists to argue that technological change is transforming the nature of contemporary capitalism. According to them, economists who believed that a capitalist economy couldn't sustain strong growth, a low jobless rate and stable prices for long, "miss the mark because of sweeping changes in the U.S. economy." Those changes, over the previous two decades, "resulting from a spurt of invention and innovation, led by the microprocessor", were seen to have generated a new economy, in which "knowledge is more important to economic success, than money or machinery". Since this opened all sectors of the economy to productivity gains, rapid productivity growth was no more "the province of manufacturing, a shrinking segment of the economy for four decades" (Cox and Alm 2000: 4-5).

Based on such arguments, a large segment of the mainstream media and mainstream economic analysis has been obsessed with the emergence of a new, "knowledge economy" in OECD countries and elsewhere. Two factors are assumed to have contributed to this development. First, the combination of widening international markets and increased international competition associated with globalization, which is forcing firms to change management practices, outsource activities and downsize their operations so as to reduce costs. Second, the lagged effect of a stream of innovations[1] that have occurred over several decades, which has not merely raised productivity and reduced prices in the information economy, but generated a host of new products and services elsewhere. Our principal concern here is the impact this has on *actual* nature of work and labour markets and on *perceptions* of the appropriate form that work and labour markets should take. The latter matters because of the effect it has on labour market policies that may be prescribed by those who believe in the need for a paradigm shift.

Middle income developing countries like India too are seen as capable of exploiting the knowledge revolution, if they adopt the "appropriate" policies. According to a study by the World Bank (2005: 10), "India has many of the key ingredients for making this transition. It has a critical mass of skilled, English-speaking knowledge workers, especially in the sciences. It has a well-functioning democracy. Its domestic market is one of the world's largest. It has a large and impressive Diaspora, creating valuable knowledge linkages and networks. The list goes on: macroeconomic stability, a dynamic private sector, institutions of a free market economy, a well-developed financial sector, and a broad and diversified science and technology (S&T) infrastructure. In addition, the development of the ICT sector in recent years has been remarkable. India has created profitable niches in information technology (IT) and is becoming a global provider of software services. Building on these strengths, India can harness the benefits of the knowledge revolution to improve its economic performance and boost the welfare of its people."

The recognition of the role of knowledge in facilitating economic growth is not new. As Joel Mokyr (2002: 76) argues: "Any historical account of economic progress, and above all accounts of the Industrial Revolution and its aftermath, need to incorporate the concept of useful knowledge explicitly." Put simply, "what people knew affected what they did." The change over time was that the extent and tightness of "propositional knowledge" – or acquired beliefs about natural phenomena and regularities – has increased substantially, increasing the ability to generate instructional or prescriptive knowledge on "how" to do things, which includes what are commonly called techniques.

In his view" "The much heralded "IT revolution" of our own age is not just about the fact that we know more (and different) things, but that the flows of information in and out of agents' minds are much more rapid. The continuous exchange of useful knowledge between the minds of agents and between agents and storage devices has become much faster and cheaper since the early 1990s" (Mokyr 2002: 8-9).

[1] These are seen to include "the impact of sharply lower prices and increased efficiency in computers, cell phones, and the Internet; a host of other new goods and services, innovation in financial markets, and new methods of payment; and reductions in costs and improvements in quality and efficiency associated with the use of these technologically based changes in other goods and services." (Landefeld and Fraumeni 2000).

When can this process result, if at all, in the emergence of a "knowledge economy" necessitating a paradigm shift? According to leading "knowledge economy" theorists, David and Foray (2002: 9-10), this "recently coined term … marks a break in the continuity with earlier periods, more a "sea-change" than a sharp discontinuity." The sea-change is, in their view, a result of a number of features of the current conjuncture. Principally, there has been acceleration, to unprecedented levels, of the pace at which knowledge is being created, accumulated and rendered obsolete. This has had a number of implications. To start with, the improvement in the quality of human and other forms of capital rendered possible by this knowledge revolution has become a crucial determinant of productivity differentials across sectors and nations. That is the intangible component embodied in "factors of production", intermediates and final goods, which is crucial to the determination of their contribution to growth, is seen to have increased substantially.

Since the transmission of these intangibles from the pure knowledge domain to commodities must be mediated by labour of different kinds which must acquire the necessary intangibles, investment in intangible capital involves: "on the one hand, investment geared to the production and dissemination of knowledge (i.e., in training, education, R&D, information and coordination); on the other, investment geared to sustaining the physical state of human capital (health expenditure)." This investment would support the proliferation of jobs in the production, processing and transfer of knowledge and information.

It is obvious that not all sectors would simultaneously benefit equally from the accelerated production of new knowledge, even though the notion of a "knowledge economy" presupposes substantial diffusion of the application of new, intangible knowledge in economic activities. This implies that arbitrary measures or investment, output and employment indicators characteristic of knowledge economies would differ in terms of the sectors they focus on at a given point in time and over time. Adopting, "the simple yet highly restrictive measure of investment in research and development, public education and software", David and Foray (2002: 10) found that such investment in the OECD countries had "grown strongly since the 1980s (at an average annual rate of 3 per cent)."

While these investments do not exhaust the possibilities for the production, processing and transfer of knowledge and information, they are seen as crucial support for the industries that lead the knowledge economy: pharmacy and scientific instrumentation, information and communication technologies, aeronautics and new materials.

Others have a much more expansive definition of a knowledge economy. Leadbeater (1999: 4), for example, argues: "In an increasingly open world economy, in which intermediate input markets for components have proliferated, it is increasingly difficult for companies to sustain their competitiveness on the basis of traditional assets: land, raw materials, machinery and cheap labour. In an open economy most of these traditional physical assets are available on equal terms to a company's competitors. Companies increasingly base their competitiveness on intangible assets, capabilities and competencies, which consumers value and which competitors find it hard to copy. The idea of the "knowledge-driven economy" is not just a description of high-tech industries. It describes a set of new sources of competitive advantage which can apply to all sectors,

all companies and all regions, from agriculture and retailing to software and biotechnology." In sum, the rise of the knowledge economy is synonymous with the process of globalisation and the growing role of competition in less-regulated, market-driven economies in determining economic outcomes.

The difficulty is that this makes the arrival of a so-called "knowledge economy" a presumption rather than an empirically established fact for a number of reasons. Firstly, the stock of knowledge embodied in production is difficult to measure and compare across time. More specifically, an agent's stock of intangibles is difficult to measure, and resorting to indicators such as the difference between the book-value and stock-market value of a firm, makes it dependent on speculation of various kinds. The observed volatility of stockmarket valuations only goes to prove that such a measure cannot be defended.[2]

Even a more limited view of a knowledge economy, which gauges its emergence in terms of the extant of production and use of information and communication technologies, is unsatisfactory. It implicitly privileges ICT over other transformative technologies such as the internal combustion engine or electricity in terms of its effects on economies, since it presumes that the former results in a systemic shift whereas there latter merely delivers technological progress. The debate over the effects on productivity in the US of the ICT revolution makes clear that there is much in common between the older "revolutionary" technologies and ICTs: in particular, the productivity benefits of information technology are realised with a lag and are slow in coming.

Finally, if reliance is placed on the contribution to GDP and employment of not just ICT and ICT-related sectors but a range of "new economy" sectors including services of various kinds, many economies, both developed and developing, in the period after the late 1960s turn out to be knowledge-intensive.

Thus, writing in the mid-1980s, Katz (1985) had observed that even by then there had been a shift in the occupational composition of employment and evidence of the emergence of a significant 'information' workforce. This was not restricted to the developed countries alone, but characterised developing countries as well. Katz arrived at this conclusion by linking the rise of an information economy to the growth of services employment of certain kinds. He defined information occupations as comprising all professionals, technicians, adminstrative, executive and managerial personnel as well as clerical workers; these were separated from other 'non-information', service occupations, such as workers in transport and communication, sales workers, and service, sport and recreation workers.

Conventionally four factors were seen as driving the increase in the overall share of workers in services in the course of economic development: (i) the inevitable diversification of demand away from agriculture to manufacturing and then to services as per capita income rises, as a result of the operation of Engel's law (Bell 1973); (ii)

[2] Thus Leadbeater (1999: 4) suggests: "Stock market valuations of companies, especially high-tech and service companies, are frequently several times higher than their book values, which reflect the break-up value of their physical, tangible and financial assets. This gap between market and book values – known as Tobin's Q – is taken by many as evidence that intellectual capital, broadly defined, is increasingly important to corporate wealth.

structural changes within manufacturing production processes resulting in the separation of planning, forecasting, and organizational functions from production workers and their transfer to other workers, who are not then directly involved in the physical manipulation of materials, resulting in the growth of 'white collar' clerical, administrative, management occupations (Jonscher 1982); (iii) the lower productivity of services necessitating a larger workforce for every unit of its output; and (iv) the increasing role and influence of government, which employs a growing workforce under the categories of public administration, social services provision and defence.

Crucial to the change in occupational composition was relative roles of physical and organisational productivity. In the early stages of the Industrial Revolution, increasing production from limited labour and material resources was the focus of attention, making improvements in pure technical efficiency, rather than management and the organization and handling of information that had to be acted upon, the principal concern. But as technological progress and competition made economies more complex, information-handling functions such as coordinated information acquisition and analysis became central to the management of successful production processes. The result was a shift within manufacturing in the structure of the workforce away from production-related workers in favour of information workers broadly defined.

Even if this argument may be overstating the case, it must be seen as an important explanation for the growing share of workers who are not directly involved in commodity production. Hence, it is a significant component of the contribution made by the three factors identified by the OECD (2000) as explaining information sector growth: the shift in employment towards the service sector and away from agriculture and manufacturing; the internal changes in composition occurring within service sector employment; and the substitution of information for non-information labour in the manufacturing sector.

From the point of view of developing countries, to these factors must be added the effects of the premature expansion of services resulting from the impact of their integration to the global economy. In his analysis of long-term development trends in the developing world Bairoch (1977) observed that the economic relationship of the developing world with the developed industrial countries had resulted in some “distortion” of their economic structure reflected in the early burgeoning of service activities. This was partly driven by the global expansion of the services industry necessitated by: (i) the transfer of technologies and organisational forms that have associated with them a large services workforce from the developed to the developing countries; (ii) fact that the transfer of more capital-intensive technologies reduced the ability of the manufacturing sector in late industrialising countries to absorb surplus labour in agriculture, resulting in and excessive development of commercial activity, public services and primitive service jobs; and (iii) the global expansion of the international services industry itself.

As a result of all this, if the Katz definition is used to include a large chunk of services in the information sector, the rise of the information workforce was visible in the developing countries well before the current process of globalisation began. Figures quoted by Katz show that between 1960 and 1980, the share of agriculture in the work force was declining uniformly across the developing countries, though there were significant variations in the rate of decline across countries. This had resulted in a diversification in occupational composition in favour of both manufacturing and servcies.

However, in the case of the share of manufacturing occupations and 'non-information services', the absolute increase in share declined between the 1960s and 1970s. While the share of manufacturing occupations rose by 3.1 percentage points in the 1960s, the increase was just below one percentage point in the 1970s. Moreover, even for the 1960s, the increase in the average for developing countries was largely accounted for by double digit changes in Korea and Iran. The lower average increase in the 1970s was, on the other hand more evenly distributed among developing countries.

The share of 'non-information' services occupations in the total workforce also rose, though by less than that of manufacturing. And it displayed a similar inter-temporal pattern, with an increase of a higher 2.1 percentage points in the 1960s and 0.8 of a percentage point during the 1970s.

The exception to these trends of a decelerating shift away from agriculture to manufacturing and services was the information workforce broadly defined. To quote Katz (1986: 212-213): "The growth pattern of the information sector is similar to that of the industrial and service sectors, with three significant differences. First, the information sector shows the largest rise in share, both in the 1960s and in the 1970s. Second, the percentage point changes are larger in the last (*latter*) decade than in the 1960s, which is the opposite (*of the*) trend observed in the manufacturing and service sectors. Third, the differences among LDCs, as measured by the standard deviation, are the smallest among the four sectors. This means that the trend of an increasing share of information occupations is more consistent than for the other sectors across the developing world."

The Bairoch argument would suggest that this tendency would only be aggravated in the years of globalisation characterised by the premature spread of internationally developed services such as advertising, banking and finance to developing countries and by the offshoring of a number of outsourced services from the developed to the developing countries. Moreover, there is reason to believe that the Jonscher/Katz tendency would now be reflected in a burgeoning of the aggregate services sector *per se*, because of the trend towards the outsourcing of information handling tasks to outside entities and agencies, as part of an effort by firms to reduce costs and focus managerial attention on core activities. Thus, between 1972 and 1998, manufacturing's share of private gross product in the US declined from 23.4 per cent to 16.4 per cent, whereas the share of services rose from 51.0 per cent to 64.7 per cent (Lum, Moyer and Yuskagave 2000). However, during more or less the same period, within manufacturing, while the share of intermediate transactions or costs paid out by individual activities remained constant at 43 per cent of industry gross output, the share of manufacturing intermediates declined from 22 per cent to 17 per cent and that of services rose from 21 per cent to 27 per cent (Guo and Planting 2000: 2). This growing services-intensity of manufacturing can be interpreted in two ways. On the one hand, it can be taken to reflect the growing productive role of services activity in the US economy. On the other, it can be seen to be a reflection of a growing trend towards outsourcing of services by US corporations. If the latter were true, it would imply that part of the rise in the share of services and decline in that of manufacturing in GDP is in part a statistical rather than a real phenomenon, reflecting the splicing out of services that were earlier part of the value of manufacturing output. This would be reflected in workforce figures too.

In sum, the growth in the share of information workers broadly defined is a long-term trend in developing, market-driven economies, and the importance of such workers cannot in itself be used as any indication either of the level of development of a country or of the emergence of a 'new', "knowledge economy". In the circumstance, it would be best to stick by the conventional indicators of the expansion of the knowledge sector such as the educational level of the population, the investment and workforce in higher education and R&D establishments, and, most importantly the diffusion of information technology, which reflects the ability to store and communicate information and knowledge.

In terms of these indicators, India is nowhere near the verge of transformation to a knowledge economy. Taking a basic indicator like the spread of literacy and education, as Table 1 shows, the spread of literacy has been slow during the years of globalisation and in 1999-2000 the country was far short of total literacy even in the more developed urban areas.

Table 1: All-India literacy rate (per 1000 persons)

Year and round	Rural		Urban	
	male	female	male	female
(1)	(2)	(3)	(4)	(5)
1983 (38th)	449	219	693	515
1987-88(43rd)	484	260	719	556
1993-94 (50th)	545	321	759	616
1999-00 (55th)	588	385	784	657

Source: NSS 38th, 43rd, 50th and 55th Rounds

Further, as Table 2 shows, even in 1999-2000 only 18.9 and 46.4 per cent of males of age 15 years and above had an educational level of secondary school and above in urban areas, with the figures for females standing much lower at 7.7 per cent and 32.8 per cent respectively.

Thirdly, as Table 3 indicates just one per cent of persons of age 15 years and above in rural areas and less than 5 per cent in urban areas had technical qualifications of even the rudimentary kind by 1999-2000. By no stretch of imagination then can India be characterised as a knowledge economy in any meaningful sense.

Table 2: Per 1000 distribution of persons by general educational level				
year and round		general educational level		
	not literate	literate& up to primary	middle	secondary & above
(1)	(2)	(3)	(4)	(5)
		rural male		
1993-94 (50th)	455 (411)	337 (276)	109 (154)	98 (157)
1999-00 (55th)	412 (372)	342(262)	126(178)	117(189)
		rural female		
1993-94 (50th)	679 (708)	230 (166)	56 (73)	34 (53)
1999-00 (55th)	615 (652)	260(174)	75 (96)	50 (77)
		urban male		
1993-94 (50th)	241 (162)	332 (233)	145 (184)	281 (419)
1999-00 (55th)	216 (144)	309 (199)	156 (193)	317 (464)
		urban female		
1993-94 (50th)	384 (363)	310 (216)	118 (143)	187 (277)
1999-00 (55th)	343 (318)	299 (195)	132 (157)	225 (328)
Note: Figures in parentheses are the corresponding proportions for persons of age 15 years and above.				
Source: NSS 50th and 55th Rounds				

Table 3: Estimated number of persons of age 15 and above by technical education level				
1999-2000	Rural		Urban	
	Number	Percent	Number	Percent
Graduate and above in:				
agriculture	513800	0.12	728700	0.46
engineering/technology	186300	0.04	982200	0.61
Medicine	170500	0.04	439700	0.28
Technical degree in agriculture/				
engineering /technology /medicine etc	229000	0.05	491200	0.31
Diploma or certificate in:				
agriculture	100800	0.02	131800	0.08
engineering/technology	947500	0.22	1784300	1.12
medicine	284600	0.07	303300	0.19
crafts	214900	0.05	265300	0.17
other subjects	1775800	0.41	2737000	1.71
Total estimated persons	429455200	100.00	159748900	100.00
Source: NSS 55th Round				

Finally, India like many other developing countries is a relatively minor spender on R&D despite substantial state support (Table 4). India spends between 0.6 per cent and 0.8 per cent on R&D, which is well below that even in many other developing countries like

South Africa and the newly industrialised developing countries of Asia. Interestingly, the other booming Asian economy, China, is also a minor player as yet.

It follows that the only criterion on the basis of which India can be seen as capable of transforming itself into a knowledge-based economy is the growth of its IT sector. In absolute and relative terms the size of the IT sector in India is now impressive. NASSCOM estimates the size of the industry at $22 billion, comprising of $4.8 billion of domestic revenues, $12 billion of software and services export revenues and $5.2 billion of revenues from exports of IT-enabled services and business process outsourcing (BPO). Placed in the context of the economy as a whole, the sector's revenues now amount to 4.5 per cent of GDP. This makes it an important segment of the non-agricultural sector.

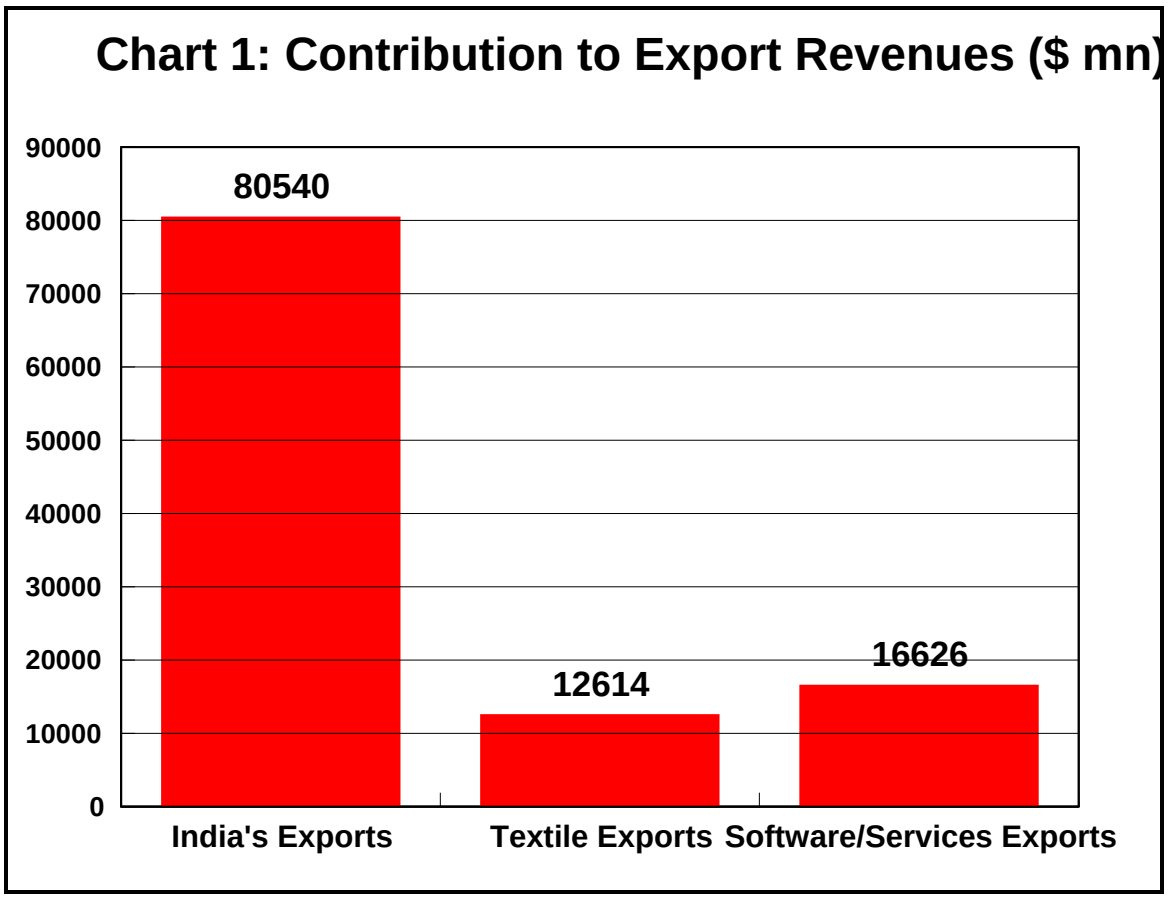
By way of comparison, the gross revenues from IT services was in 2004-05 about 20 per cent higher than the GDP generated in India's construction sector and almost three times as much as the GDP in mining and in electricity, gas and water supply. What is more, gross revenues from IT services exceeded 12 per cent of GDP generated in India's services sector as a whole, which accounts for more than 50 per cent of the nation's GDP. Thus, even though the software and IT-enabled services sector started from a small or negligible base a decade back, its rapid expansion at an annual compound rate of more than 30 per cent per annum between 1998-99 and 2004-05 has ensured that it is today an important presence in the economy.

Table 4: Expenditure on R&D (GERD) in billion US$ PPP and R&D intensity (GERD/GDP)

Regions/Countries	1990		1996/1997		1999/2000	
	GERD	GERD/GDP	GERD	GERD/ GDP	GERD	GERD/
World total	409.8	1.8%	549.7	1.6%	755.1	1.7%
Developed countries	367.9	2.3%	460.4	2.2%	596.7	2.3%
Developing countries	42.0	0.7%	89.3	0.6%	158.4	0.9%
Americas	167.7	2.1%	225.8	2.0%	302.3	2.2%
North America	156.4	2.6%	209.0	2.6%	281.0	2.7%
Latin America & Caribbean	11.3	0.5%	16.8	0.5%	21.3	0.6%
Europe	138.8	1.8%	157.7	1.7%	202.9	1.7%
European Union	101.9	2.0%	137.9	1.9%	174.7	1.9%
Central & Eastern Europe	5.7	1.7%	5.6	0.8%	9.1	0.9%
Africa	5.2	0.6%	4.3	0.3%	5.8	0.3%
South Africa	2.9	1.0%	2.5	0.7%	3.6	0.8%
Other sub-Saharan Countries	1.9	0.5%	0.6	0.1%	1.1	0.2%
Arab states (in Africa)	0.4	0.3%	1.2	0.2%	1.1	0.2%
Asia	94.2	1.8%	154.8	1.2%	235.6	1.5%
Japan	67.0	3.1%	83.1	2.8%	98.2	2.9%
China	12.4	0.8%	21.1	0.6%	50.3	1.0%
Israel	1.8	2.5%	3.4	3.2%	6.1	4.7%
India	2.5	0.8%	13.2	0.6%	20.0	0.7%
Newly Industrialised Economies (in Asia)	8.2	1.6%	26.7	1.1%	48.2	1.7%
Community of Independent States (in Asia)			0.6	0.4%	0.6	0.3%
Arab states (in Asia)	1.9	0.4%	0.8	0.1%	0.6	0.1%
Other Asia	0.5	0.2%	5.9	0.5%	11.6	1.1%

Oceania	3.9	1.1%	7.2	1.6%	8.5	1.5%
Source: UNESCO website						

The fact that the rise to maturity of this sector has been driven predominantly by external demand is also well recognised now. Exports of software and IT-enabled services have risen at a compound annual rate of 38 per cent a year since 1997-98, and overwhelmingly explain the rapid rise of the sector. In 2004-05 exports of software and services (Chart 1) as estimated by the Reserve Bank of India was, at $16.6, equal to a fifth of India's merchandise exports and higher than one of India's principal commodity exports, viz. textile and textile products (including carpets).



This has made IT services exports an important component of India's total (merchandise and non-merchandise) exports. The ratio of IT services to merchandise exports has risen from 13 per cent in 2000-01 to an estimated 20 per cent in 2004-05. Further, the ratio of net IT services export earnings to total net invisible earnings rose from 53 to 59 per cent between those two years.

However, the sector's contribution to employment does not compare with its role in the generation of income and foreign exchange. The only available estimates here are those from NASSCOM, which indicate that employment rose from around 285,000 in 1999-2000 to just above one million in 2004-05, or at a compound rate of about 28.5 per cent per annum. This is indeed remarkable given the fact that rate of growth of employment during the second half of the 1990s (1993-94 to 1999-2000) as per NSS statistics

amounted to just 0.67 per cent in rural areas and 1.34 per cent in urban areas. But, what the growth rate figures conceal is the low base from which employment has grown, making the absolute contribution of the sector to employment minimal.

As the figures in Table 5 indicate, in 1999-2000, relative to the current weekly status estimates of employment yielded by the NSS Survey on employment and unemployment, employment in India's IT sector amounted to just 0.21 per cent of the non-agricultural workforce in the country, 3.4 per cent of employment in the production of textile products and 0.08 per cent of the aggregate workforce.

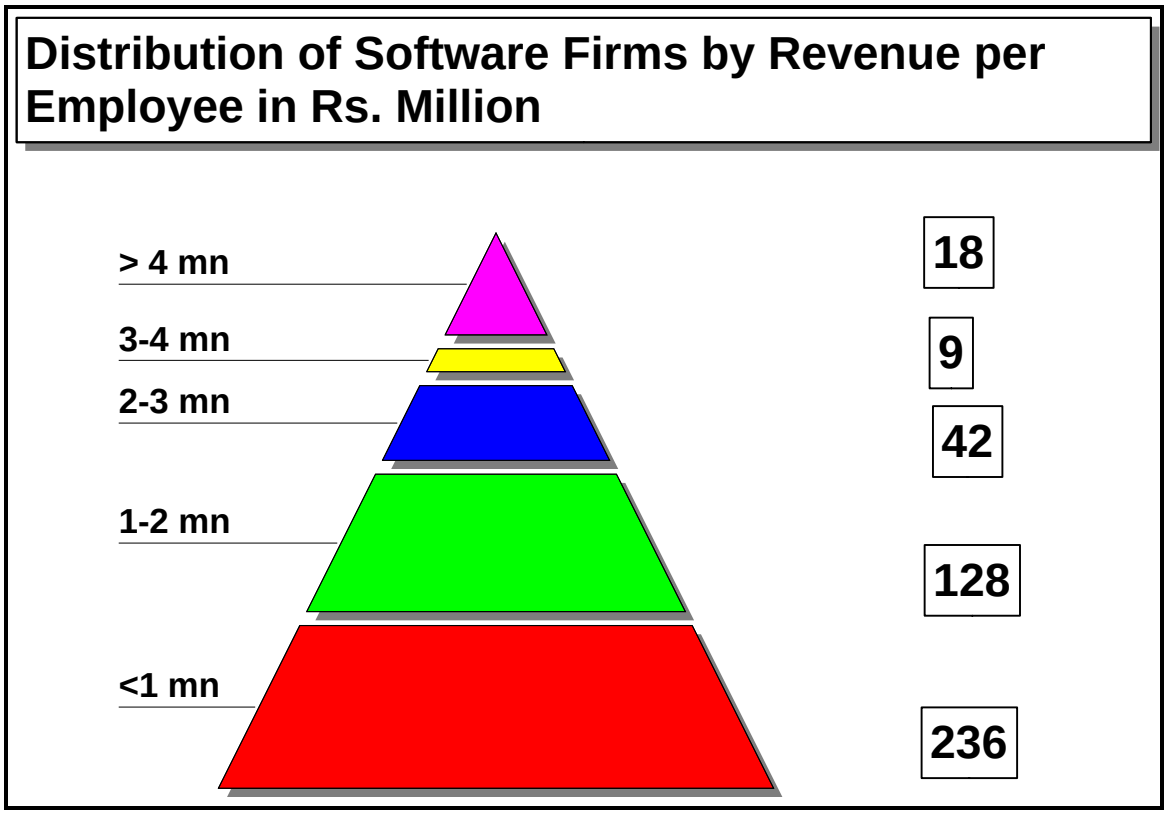
Table 5: Employment Indicators 1999-2000	
Estimated weekly status workers in textile industry	8351313
Estimated weekly status workers	340368600
Estimated non-agricultural workforce	135756855
IT sector employment	284000
IT sector employment 2004-05	1000000
Source: NSSO and NASSCOM	

Further, the domestic industry has turned out to be a multi-layered, heterogeneous formation, with firms operating in different hardware, software and services segments, characterised by extremely wide margins. At the top are the successful firms focusing on the export market for software and IT-enabled services, especially the former. At the bottom are the large numbers of independent assemblers who find their margins depressed by falling duties on imported systems and components.

According to NASSCOM figures, in 2003-04 the top 20 software and IT services exporters accounted for as much as 61 per cent of total export revenues. But even within the services segment the industry is highly differentiated. Revenues per employee are distributed extremely unequally, with the few top players obtaining high margins and a large share of the market, and the industry being overcrowded with a number of small firms with low turnovers and extremely low margins (Chart 2).

This skewed distribution explains the "winner-takes-all" scenario in the industry, showcased by a few highly successful firms with skyrocketing stock values and billionaire owners, while the fact that the experience of a majority of firms in the sector does not match this scenario goes unnoticed. Extreme concentration with attendant implications for income inequality is a core feature of the industry.

This aspect is combined with a number of other features that are indeed disconcerting. The first is that while the external market is the prime driver of growth in this sector, that market is dominated by one country: the US. This makes the industry vulnerable. Any slow down in the US can have a dramatic impact on the fortunes of the industry.



Source: Calculated from figures obtained from Centre for Monitoring the Indian Economy, *Prowess Database*.

Second, India today dominates the global market for outsourced software and IT-enabled services. NASCCOM quotes an estimate according to which India today accounts for 44 per cent of the global market for offshored services. This ratio goes up to 55 per cent if only the ITeS-BPO segment is considered. If current growth rates are to persist either the global offshoring market would have to grow at that rate with a stable Indian share or the industry would have to increase its already large share of the global market over time. That is indeed a touch difficult.

Third, since the ITeS-BPO sector accounts for a rising share of total revenues, India's dependence on the less skill-intensive segments of the software and IT-services sector is rising. This makes it even more difficult to maintain market shares, especially without a substantial drop in revenues per employee, since competitors are more easily generated.

Finally, even if India's share of offshoring revenues remains high, the net benefits of this are still unclear because of the dominance of a few firms and a substantial share for captive offshore outsourcing by international firms in the ITeS-BPO sector. According to NASSCOM, captive ITeS-BPO providers accounted for as much as 65 per cent of the value of ITeS contracts outsourced to India. This kind of concentration not only makes the linkage effects of the growth of the industry less significant, it also has adverse implication for the net foreign exchange earning of the sector after taking into account repatriation of profits and other payments abroad.

The relatively small share of the IT sector in employment, the high degree of concentration in the industry and the intra- and inter-industry income differentials that accompany its growth, suggest that its external effects on the rest of the economy and on economic welfare are not just limited, but even adverse. In particular, the demand for still-scarce skilled labour and the wages paid to attract labour into the sector are such that it adversely affects the availability of skilled labour at reasonable cost for the commodity producing sectors. Moreover, there are segments of this sector, especially the ITeS segment that is erroneously bundled into the IT services industry, which cannot be considered hi-tech. Yet the sector is privileged in many senses: access to government infrastructural support, tax concessions and public investment aimed at generating a workforce.

To summarise, whatever be the measure we adopt of India's progress towards a "knowledge economy", reasonably defined, the goalpost is not even in sight. This suggests that talk of India's ability to exploit the benefits of the knowledge revolution and transform itself into a knowledge economy is driven by considerations other than recognition of what is possible and can be pursued if the ambition exists and appropriate policies can be put in place.

If yet there is an emphasis on India's potential to emerge as a knowledge economy merely based on enclave-type growth in the IT sector, it is because the argument can be used to justify economic policies, especially labour market policies, which are inappropriate. What are considered appropriate policies with regard to production, trade and labour could vary between sectors. If therefore an exaggerated view of the information revolution or of the role of intangibles such as knowledge in overall economic activity becomes the mainstream opinion, there could be a tendency to recommend that policies considered appropriate for the so-called knowledge or information sectors are applied more generally to the economy as a whole. These could influence opinions on the role of government regulation or on the flexibility needed in labour markets.

One obvious way in which notions of India's knowledge advantage influences policy is that since the IT sector has grown largely on the basis of relatively unregulated private initiative, its success is used as an argument against such regulation. In fact, even the limited regulation of labour markets that currently exists in the country is seen as detrimental to the emergence of the knowledge economy.

Thus among the policies identified by the World Bank (2005) as conducive to India's transformation into a knowledge economy are:

- speeding up trade reform by reducing tariff protection and phasing out tariff exemptions;
- encouraging FDI and increasing its contribution to economic growth by phasing out remaining FDI restrictions and increasing positive linkages with the rest of the economy;
- simplifying and expediting all procedures for the entry and exit of firms, for example, through "single window" clearances; and

- reducing inefficiencies in factor markets by easing restrictions on hiring and firing of workers.

Across the world advocates of flexible labour markets have often turned to the new requirements set by the rise of the information or knowledge economy to justify their case. The evidence does indeed suggest that there has been an increase in flexibility in the sense of decreasing job stability, higher temporary unemployment and greater mobility of workers in the US and the EU, though to a lesser degree in the latter. As Benach et. al. (2000: 1316) observed, labour flexibility is reflected in the growth of atypical employment or underemployment, with reduced job security (e.g., home-based work, temporary work, informal work), and the decline of standard full-time, permanent jobs. According to estimates of the International Labour Organization, by 2000 25 per cent to 30 per cent of the world's workers—between 750 million and 900 million people—were underemployed in the sense that they were working substantially less than fulltime even though they wanted to work longer or were earning less than a living wage. In Europe, "precarious paid employment" (defined as fixed-term and temporary contracts) accounted for 15 per cent of paid employment. In the United States, where if flexible work was defined to include any kind of flexible job (e.g., part time, independent or company contract, self-employment, on call, temporary, day labor), the proportion amounted to 30 per cent of the workforce even as early as 1995.

The reasons for this are also well recognised. Increasing concentration has increased expectations with regard to profit margins whereas the more intense oligopolistic competition associated with globalisation is forcing firms to hold down prices. In the inevitable race to cut costs that this sets off, wage costs are one of the areas targeted. And flexibilisation helps keep wage costs down by making it a variable rather than a fixed cost and by exerting downward pressure on the wage rate. Many economists have discussed the role of flexibilisation in transforming the nature of wage bargaining and in the lowering of the non-accelerating inflation rate of unemployment.

What is remarkable however is that instead of seeing this as a problem that awaits resolution, it is increasingly being argued that technological changes have rendered flexibilisation the new basis for competitive success of firms, industries and countries. Since the lowering of international trade barriers, access to easier and cheaper means of transport and the information and communication revolution, has inevitably increased competition, it is argued, companies are forced to react more quickly and flexibly to market signals than before. As Knuth (2000: 1) notes, from this it is commonly inferred that employment, too, would have to become more flexible, so that employers can adapt the number and composition of their workforces to changing requirements with less external restraints and within shorter periods of time. "All this appears to come down to the imperative for establishments to hire and fire manpower at increasing rates as their only way of adapting to changing market requirements." In fact, the failure of Europe to move adequately in this direction is seen as explaining its inability to match productivity increases in the US and remain competitive.

What is surprising is that the knowledge economy discourse is being used even in a country like to India to make a case for permitting firms to hire and fire workers (as in the World Bank report quoted above), to ban unions in the IT, IT services and business

process outsourcing (BPO) sectors and to modify the law relating to contract labour to facilitate flexible employment.

There are many features of India's labour market that are ignored in the process. To start with, the case for increased flexibility applies only to the organised sector in India, whose share in total employment is currently well below 10 per cent. Even within this sector flexibility has been a historical feature. Thus, temporary "badla" workers were an important component of the workforce, allowing firms to adjust employment levels to the requirements of the business cycle.

Moreover, in practice there was no real problem of "exit" for investors in the industry, who in fact chose to repatriate profits out of the industry to finance their investment in newly emerging and profitable sectors. In fact, it is because such siphoning out of funds left little surplus for renovation and modernisation that the industry could not face up to the competition from the powerloom sector leading to the virtual disappearance of the weaving shed in the mill sector. By then investors had 'exited' with capital that was many multiples of their initial investment and the hope that they would be able to capitalise the land on which the mills exited.

Second, even without Indian's transition to a knowledge economy having occurred, the data collated by the Directorate General of Employment and Training, suggests that a process of flexibilisation has been underway inasmuch as "whether we assume reported total organised employment to be entirely non-agricultural, or entirely urban or entirely urban non-agricultural, the share of organised employment has declined significantly over time whatever subjective but reasonable allowance one chooses to make about underestimation." (Tendulkar 2003: 5). Third, overall there is evidence of a decline in regular employment and an increase in the share of self-employment and casual employment, which are all features of a flexible labour market.

In sum, depending on one's predilections one can either argue that the poor employment performance of the commodity producing sectors during the years of globalisation have resulted in a forced process of flexibilisation that has not yielded the results it is supposed to deliver, or suggest that India's higher rates of GDP growth since the 1980s, as compared to earlier decades has been made possible by flexibilisation. What one cannot argue is that inadequate flexibilisation has held back India's transformation into a knowledge economy. To do so, as the World Bank and others of similar inclination suggest, is to use the knowledge economy as a ideological ruse to advance a reform agenda which would only aggravate the inequalising effects of India's so-called "economic reform".

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