

IT Roadmap: Globalisation of software, opportunities for Nigeria (1)

THIS write-up is an adaptation from Ashish Arora (Carnegie Mellon University, Pittsburgh) and Alfonso Gambardella's (Sant Anna School of Advanced Studies, Pisa) Concept of the Globalisation of the Software Industry – Perspectives and Opportunities for Developing Countries. The study evaluated the spectacular growth of the software interest and concern at the knowledge society level.

Today, it is globally acknowledged that the skills to productively transform knowledge and information into innovative products and services will define successful knowledge economies of the very near future. This is because knowledge and information have become the most important currency for productivity competitiveness, and increased wealth and prosperity, nations have placed greater priority on developing their human capital. Governments around the world are thus focusing on strategies to increase access to and improve the quality of education. Decision makers find themselves asking key questions: What defines a quality education in today's global information-based and knowledge-centric economy? Has governance and education kept pace with a rapidly changing world? What is the fate of a developing nation like Nigeria, with the complex parameters of global knowledge development economics and politics?

In their joint paper, Ashish Arora and Alfonso Gambardella addressed two sets of inter-related

issues. First, they explored the determinants of these successful stories and lessons learnt, if any. From the United States (U.S.) perspective, they revealed that the interesting debate is not the current one on the impact of outsourcing on jobs, but instead on whether offshoring of software is a long-term threat to American technological leadership. They conclude that policymakers in the U.S. should not fear the growth of new software producing regions. Instead, the U.S. economy will broadly benefit from their growth. The U.S. technological leadership rests in part upon the continued position of the U.S. as the primary destination for highly trained and skilled scientists and engineers from the world over. Though this is likely to persist for some time the increasing attractiveness of foreign emerging economy destinations is a long-term concern for continued U.S. technological leadership.

One rather unexpected phenomenon of the 1990s has been the spectacular growth of the software industry in some non-G7 economies. The first element of surprise is that these are not countries where one would expect to see the growth of what is commonly thought of as a high-tech. The second element is that what the 1990s have shown is not just growth of the industry, but a remarkable growth. In India, for example, software production was virtually non-existent in the early 1980s. Today software employs more than 450,000 employees, sustaining yearly growth rates

of 30-40 per cent in revenues and employment over more than 10 years.

In their paper under evaluation, they discussed the growth of the software industry in five newcomer regions – India, Ireland, Israel, Brazil and China based on the results of a two-year international project (as specified under Arora and Gambardella, 2005). The five comparisons provide an interesting basis for our discussion at this state of our national Information Technology (IT) knowledge adventure. From their findings we understand that while the growth of India, Ireland and Israel has been fuelled by exports, China and Brazil have grown largely thanks to their domestic market. From the evidence collected for these countries, in they examined some of the reasons why such countries have been successful in software. They also analysed some of the implications of this growing international division of labour for the U.S. economy. For example, they took the Indian point of view. There is one effect in particular that has to be assessed more carefully, and this is the large outflow of human capital from India. They also examined the pros and cons of these flows for both India and the U.S. The study examined – in particular, whether the patterns of growth of software in our five countries can provide lessons for other emerging economies, in software or in the IT industries more generally. In sum-

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mary, the study looked at some of the policy implications concluded by providing some broad considerations on the subject of global software development dynamics.

The software industry in Brazil, China, India, Ireland, and Israel

During the 1990s India, Ireland and Israel have emerged as significant software exporters. In the same period, Brazil and China have also developed an extensive software sector relying largely on the domestic market, and are now attempting to move to exports. In 2002, for example, the Indian and Chinese industries were of comparable size (respectively \$12.5 and \$13.3 billions), while the 2001 sales of Brazil and Israel were \$7.7 and \$4.1 billions. The Irish industry reached \$13.9 billion in total sales in 2002, of which \$12.3 billion is attributed to the multinational companies and \$1.6 billion to the indigenous sector.

Moreover while the 31s stand somewhat separately because of a set of peculiar features (e.g. the "Diaspora", English-speaking human capital, large export shares), the patterns observed for China and Brazil bear greater similarities with other non-G7 countries. For example, in South Korea too the software industry has relied mainly on the domestic market, and on spillovers from leading industries like hardware and electronics. The Irish MNC sales are most likely inflated by accounting

devices guided by the substantial tax concessions offered by the country. Indeed, the MNCs (Multi-National companies – henceforth) in Ireland have employment levels comparable to that

of the indigenous firms (15,300 and 12,600 respectively in 2002), while their sales are over eight times as much. Since they mostly localise their products in Ireland not design them; this gap must arise mainly from accounting reasons.

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