

e-Development – post-Industrial Emerging Economies?

Is it possible that Information Technology could be the bootstrap for an emerging economy? It has long been assumed by the world development community that emerging economies must pass through the same stages as the developed economies: agriculture, raw materials production, and industrial manufacture. This position paper asks whether some emerging economies might progress directly from agriculture to a post-industrial economy based on Information Technologies.

There are several reasons why we (the developed nations) might wish to see this happen:

1. In a globalised economy it is difficult for an emerging economy to quickly achieve competitiveness as an industrial nation. For some products, e.g. cars, there is either already excess capacity or for others, e.g. ships, there is too much fluctuation to support a new entrant with limited capital. It has been argued that such countries would best enter the global industrial economy by importing the most effective plant rather than trying to leverage their low labour costs.
2. An industrial economy is inevitably polluting, particularly an inefficient industrial economy. It would be to the advantage of the developed economies to help the emerging economies to avoid this polluting stage of development.
3. It might well be that an IT-based economy requires lower capital investment per unit of revenue generated than an industrial economy (tbc).
4. *Pace* the current recession, the developed economies will within a few years again reach the limits of their native IT skills and will need to find new resource pools.

In 2002 the Information Technology industry will generate revenues of the order of \$1.5T or roughly 5% of the global product. IT-intensive businesses today spend 6-10% of revenue on IT. If we assume sustained global growth of 3% over the next 20 years, and that the penetration of IT into the economies continues, we could have a global product of \$60T of which 10% is spent on IT, hence \$6T. Even if emerging economies captured only 5% of this, i.e. \$300Bn, it would dwarf development investment.

Information Technology has a viral characteristic in that exposure to its products as a consumer can lead spontaneously to participation in the industry as a producer, *viz.* teenager Web developers. To an immense degree it is a virtualized industry – its products can be created anywhere on Earth. Developing an infrastructure that can support consumers also assists in developing a local industry and *vice versa*. The infrastructure investment required to support one software developer is of the order of \$3,000 in local computing equipment and \$3,000 in network equipment (est., tbc) (averaged over reasonable numbers) and an annual cost for computer and network services of \$5,000 (much of which will contribute to the local economy). Such a developer can generate a personal income of the order of \$20 – 60,000 per year, independent of geography, *viz.* Egypt, India, Tunisia, or Palestine. Moreover, there is no cost to ship the end product and there are no discriminatory tariffs imposed by the developed economies on this product.

A difficult problem is the training of such developers. In developed nations, the traditional path has been high school followed by 3-4 years in university study of Computer Engineering or Computer Science. Many slightly richer nations that seek to follow this path will send their young people to a developed country for this training. This leads to an unacceptable educational cost approaching \$100k per individual. However, this would then seem to be a perfect motivation for engaging in remote teaching by the developed nations, either dedicated to the specific country or as a virtual extension of an existing university course. Is there the beginning of a bootstrap here?

Among the economies, for example the Asian tigers, that emerged in the last 50 years, it was claimed that as the average family income reached \$3,000 per year, people would go out and buy motorcycles. And as the average family income reached \$7,000 per year, they would go out and buy cars. Each of these events produced an up tick in the growth rate of the economy. What is the threshold for families going out and buying PCs or devices that combine PC function with games or communications? What is the up tick produced when an economy passes this threshold?

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