

# Chapter 10 Technology and innovation

## Case study 10.1 A tale of two companies

**What are the similarities and contrasts between Nokia and Ericsson in their corporate approaches to technology and innovation?**

Both Nokia and Ericsson have long industrial histories, and are seen as symbols of Nordic industrial success. However, Nokia has been the more adventurous company: having changed its direction to the mobile telephone industry, it captured the technological revolution and also created fashion trends and a strong brand. It is this combination which has given the company competitive edge. Ericsson, by contrast, has looked to build on its existing strengths in telecoms infrastructure, but it is now developing more of a consumer orientation. Also innovative, it has forged an agreement with Microsoft to form a joint venture for wireless internet applications. Ericsson has thus sought strategic alliance as a means of generating innovation.

## Case study 10.2 India: a new tiger economy?

**To what extent does India's embrace of the new economy provide an engine for economic growth?**

India has become a global IT centre, showing rapid growth in software exports. India's software firms have moved up the value chain, to more advanced IT solutions for global companies. But there are doubts about whether this new-economy growth can create a new 'tiger economy' in India. Many old-economy problems still hamper economic development: poor infrastructure, unreliable electricity, weak support services and bureaucracy. These difficulties have held back manufacturing industries, which were the basis of Asian economic development. India's policy therefore was to take advantage of its strengths, which are mainly in skilled, English-speaking workers. But these are the elite. With generally low literacy levels, it is hard to see how India can develop modern manufacturing industries which would balance its IT expertise.

## Case study 10.3 The quest for the blockbuster drug

**What is the importance of patent protection for drug companies and how is it being eroded?**

The large pharmaceutical companies rely on patent protection for competitive advantage. It is useful here to define the patent and outline the benefits patent protection gives, chief of which is the monopoly over commercial exploitation for a period of up to 20 years. Without patent protection, drug companies would be vulnerable to others 'stealing' their drugs, and they would not be willing to pay out the huge sums in R&D necessary to discover new drugs. Hence, it is argued, the patent system is necessary to ensure that new drugs continue to be invented and tested. However, a drug may be subject to a number of separate patents, designed by the company to extend the monopoly as widely as possible. The significance of the case that Eli-Lilly lost is that, although the loss of the secondary patent for Prozac was not of great concern, this case could signal a trend in cutting down patent protection. This would open the way for generic producers, who (without the huge R&D expenditure) charge a fraction of the branded producer's price. Generic drugs are a potentially large market, and the large companies are concerned that erosion of patent protection will reduce their profits – resulting in reduced research expenditure.

## Case study 10.4 A quiet revolution in manufacturing

**In what ways is the internet transforming manufacturing and what are the implications for the future?**

Ways in which the internet is transforming manufacturing:

- Transforming product design, which may be shared over the internet
- Providing exchanges for business-to-business procurement
- Improving customer services
- Faster product innovation – links between designers and engineers via the internet
- Quicker and cheaper distribution.

The implications are that factories will be linked in internet supply chains, which will touch on every aspect of production. In terms of jobs, manufacturing will become more like an IT operation.

## Case study 10.5 A food revolution?

Begin with a definition of GM plants.

**What are the benefits and risks of GM crops for developing countries?**

Benefits:

- Genetically altered varieties of basic crops can aid in disease prevention and nutritional deficiencies
- GM crops are resistant to pests, and therefore reduce the need for pesticides and lead to higher yields.

Risks:

- Risk to biodiversity
- Dependence on the large life sciences companies who supply the seeds.

## Assignment 1

Define national innovation system. Highlight key aspects:

- Education and training
- Science and technology capabilities
- Industrial structure
- Science and technology strengths and weaknesses
- Interactions within the innovation system
- Countries with high levels of education, especially science education, are more likely to develop science and technology capabilities.

Relevance of government policy:

- Government support for higher education, in particular, science and technology areas
- Government funding of R&D, in, for example, public research bodies, occurs only in the richer countries, and may be linked to strategic considerations, such as defence
- Government-business links
- Strategic policies of governments designed to build on particular technological strengths, such as the Indian government's promotion of IT.

## Assignment 2

First, define technology transfer, and then discuss the channels through which technology is transferred. These are FDI, joint ventures, licensing, and trade in capital goods. While technology transfer is a two-way process, the main beneficiaries are the developing and industrializing countries. These countries benefit from both licensing and trade in capital goods, but they are able to gain wider and more long-term benefits from FDI. In particular, the late-industrializing countries of Southeast Asia have derived benefit from applying up-to-date technologies and management methods. Linkages with local suppliers enable local firms to benefit from technology transfer.

Collaborative innovation is a growing aspect of joint ventures, which may be between firms in advanced economies or between those in advanced and industrializing economies. The rising cost of R&D has given impetus to this trend.

The 'technology gap' (also discussed in Chapter 12) relates to the gap between the increasingly advanced technology of firms in advanced economies and the level of technological development of poorer countries. While developing countries have opportunities arising from the freedom of location of IT services, these are limited to certain sectors and are available only to relatively small numbers of people. Use of computers and the internet remains very low. The worry for these countries is that they will never be able to catch up.

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