

Notes and References

1. Everett Rogers, *Diffusion of Innovations*, Free Press, New York, 1983. The central point of the diffusion theory is that innovations which show relative advantage, compatibility, trialability and observability have a better chance of adoption and that the rate of adoption would be faster with sustained assistance.
2. Nagy Hanna is the principal operations officer in the World Bank's West Bank and Gaza Resident Mission. He is also author of several IT-related World Bank Discussion Papers. Ken Guy and Eric Arnold are directors of Technopolis, Technology Policy Consultants in Brighton, UK.
3. National champions refer to companies such as Siemens in Germany, Ericsson in Sweden, and Philips in the Netherlands which are a major source of national innovation and technology.
4. The GII concept was first proposed by US Vice-President Al Gore in his speech during an International Telecommunications Union (ITU) Conference in March 1994 in which he called for all nations to build a network of telecommunications systems, so-called 'information superhighways', that 'will allow [nations] to share information, to connect, and to communicate as a global community'.
5. The World Bank's Information for Development (*infoDev*) initiative provides technical assistance to countries in formulating national information infrastructure policies and plans and encourages private sector participation in government-supported IT programmes.

Rhoda Reyes
Bangkok
Thailand

Local Matters—Perspectives on the Globalisation of Technology

John Phillimore (Ed.)

Perth, Western Australia, Institute for Science and Technology Policy Murdoch University, 1995, xii + 186 pp., AU\$ 15.00, ISBN 0 8690 5411 2

This book is a collection of papers from the doctoral programme in Science and Technology Policy and Socio-Economic Progress (STEP), presented at the STEP meeting of September 1994. The idea to combine and to publish the work of PhD students and experienced researchers is an excellent one since it clearly shows how research is developing and which topics are focused on the younger generation of scientists. The authors and editors have to be congratulated for this idea and it would be good to see more of this.

There is a total of 36 papers in the book (including an introductory paper by Keith Pavitt), divided into four main categories which all deal with the globalisation issue, though from different perspectives. One chapter is titled 'Research, Technology and Industry', a second one is headed 'Ecological Sustainability'. The two other chapters cover 'Country and Regional Perspectives' and 'Philosophical and Historical Reflections'.

The 13 papers on Research, Technology and Industry cover a very broad scope of different topics from sector globalisation analysis (Lofgren on the pharmaceutical industry and Morigan on Medical Technology) to system theory (Barker and also Nash). The latter question is one of increased interest in the process of the intensifying internationalisation and globalisation of markets due to the fact that markets move closer to each other and thus new elements are added to existing systems and new relationships arise. New technologies imply that knowledge and information about foreign countries and markets are spread around the world immediately, thus affecting decision makers in

other locations of the world. Therefore, it becomes more and more essential not to view companies, markets or countries as isolated or separate elements but as parts of one large system.

Phillimore deals with the question of the interplay between globalisation and the labour movement. Since the book's publication the problems he describes have become increasingly important. Unions and labour movements in Western countries are not only faced with competition from low-wage countries threatening to lead to a relocation of production—mainly of lower- and middle-technology goods—to those countries. On top of that, unemployment has risen significantly in the last 12 to 24 months in some of the Western European countries, especially in Germany and France, whereas other countries (US, UK, The Netherlands) have performed better. In a number of cases this implies that it becomes more and more difficult to defend employee's interests. The conflict is not between the local firms and the local labour movement but between the local labour movement and the global markets on which the industry acts. If the skills of the employees are not essential for the specific production and if transport costs are not too high, the labour movements get into a very difficult position and unskilled or low-skilled labour in the Western world is clearly disadvantaged from globalisation processes. On the other hand, the hope of countries to overcome these problems by the growth of the service sector in which skills, innovation and flexibility are highly relevant, is a very critical point. I cannot see how the loss of jobs in the industry sector can be (over)compensated by new jobs in the service sector (especially in dynamic markets like telecommunication, (multi)media, information technology, etc.) Therefore, governments and companies will have to find solutions for the industry; for example they will have to make compromises and offer higher flexibility in the production process, in order to keep their competitiveness.

A number of papers (Tremblay, Davis, Goodwin, Katz) focus on the globalisation issue itself and specific aspects (services, computers, information technology) thereof. However, these papers centre around Pavitt's work on this field. In my view, a perspective should be added which is contained in a paper by Kogut and Zander¹ in which the authors discuss the question why internationalisation is sometimes undertaken outside (by export or by licensing) and sometimes inside (Foreign Direct Investment—FDI) a firm. The reasons—and they are especially valid for technology goods and services—lie in the features that are embodied in the product itself. Whether a firm conducts FDI—thus internalising its knowledge—depends on whether the knowledge embodied in the good/service (1) can be codified easily (i.e. can the production process be described through a standard approach?), (2) is teachable (i.e. what resources (time, money, personnel) are needed to make employees acquainted with the way the knowledge is used in production processes?) and (3) is complex (the more complexity there is—i.e. the more difficulties there are in the interplay and sequence of the elements of the production process—the more internalisation (FDI) is used for globalising the firm). This view is helpful in answering the question which firms and which products internationalise and which alternative is chosen for serving global markets.

Nine papers focus on the question of 'Ecological Sustainability' which is closely related to the purely economic topics. A number of authors (e.g. Stocker, Mouritz, Newman) refer to the 'Rio summit' and the Agenda 21 and the hopes that surrounded this conference. Now, from a 1997 perspective it remains to be asked what has become of the decisions taken and the resolutions signed in 1992? A critical assessment would have to admit that it has become very quiet about these topics today.

Another line of thought is presented in Hutchinson's paper. He points out that there is something between 'the global' and 'the local' which is 'the regional'. Regional

cooperation has been discussed for some time now; however, it is hard to find successful examples of regional, cross-border projects. Two regions (e.g. California and the northern part of Mexico) in different countries may be much closer to each other and may face much more of the same problems than two regions within the same country (e.g. California and Maine). The concept of regionalisation—making the decreasing economic importance of national borders even more obvious—does not easily gain a foothold. At least in Europe the reason lies in the fact that European ‘unification’ is going to be implemented through a common currency. Thus, the emphasis is on the political pressure and on the economic criteria and not on cultural or historical links between regions. This means that the administrative importance of national borders is still unchanged.

Part 3 (Country and Regional Perspective) contains seven papers. Willoughby discusses how local decision makers should go about improving the competitiveness of their country, region, state or city. The existing concepts are either to foster the investment of foreign (‘non-local’) companies by offering attractive conditions, e.g. in terms of tax exemptions, cheap land prices, low standards of environmental regulation etc. The other is to promote smaller, local companies in their effort to develop products which can compete on larger (perhaps world) markets. From an economic point of view, both concepts mean subsidisation; however, the competition for foreign investors is more critical for the development of regions. First of all, it might lead to regions being outcompeted by large multinational enterprises whose revenues often are higher than the GDP of the country they are entering. Second, it means that those regions outcompete each other and are worse off in the end. The profit of the single region from investment then might go in the direction of zero. Furthermore, this policy stabilises the current structure of the industry leaving no room for new enterprises with less political power in their need for assistance.

Laube returns to the question of regionalisation. In addition to the aspects mentioned before it should be noted that for some companies the regional market is much more important than the national or the global one. This can be learned from the telecommunication alliances. There are some large telephone operators which want to become global players (BT, Deutsche Telekom, AT&T) but also medium sized carriers exist which have found out that their strategy should be to serve regional markets to which their customers have cultural, historical or business links. An example is the Swiss phone company which recently entered into partnerships in northern Italy and in the southwestern part of Germany.

Specific regions and countries (Japan, Indonesia, Eastern Europe) are also discussed. The gap still remaining in development between the Western countries and other regions—in this case especially Eastern Europe (Marinova)—is surprising, taking account of the heavy investment made there by companies from the West. However, one has to bear in mind that these investments have not always benefited the local markets. That comes as no surprise since a high number of investments were undertaken in order to buy into monopolies (again the telecommunications sector serves as an example where national phone companies were bought at very high prices but with the guarantee of exclusive rights until the next millennium) or in order to exploit the cheap workforce for products which are sold on Western markets rather than locally. Thus, immediate profits for these countries are hard to find.

The final part comprises six papers on ‘Philosophical and Historical Reflections’. Here, a very different perspective is introduced to the globalisation issue. It becomes clear that the development of technology always has to be analysed in a social context (Miller and also Myint) Thus, the motto ‘Think globally—act locally’ has to be

differentiated in the following direction: while working towards the solution of global problems, act locally by using locally accepted people, measures and technologies, etc. Theoretical first-best solutions from the outside are not necessarily the best ones.

However, the development of technology tends to define leading nations which have a larger influence on a global scale. This is shown by Buttsworth taking account of historical examples. Countries which are running at the forefront of technology development (be it in gunpowder in the middle ages, in the steam machine in the 18th century or information technology and data processing today) tend to take a dominant position also for economic and social development worldwide.

Altogether, 'Local Matters' is a very interesting collection of papers which contains a number of different focal points surrounding the topic of globalisation. However, it would have been preferable not to limit the authors to such short length of 2–6 pages. Some of them do not get the chance to outline their research properly and completely and in some cases there is a lack of clarity about the topics remaining with the reader. Thus, there should either be a limited number of papers or (rather) a larger book.

Notes and References

1. Bruce Kogut & Udo Zander, 'Knowledge of the firm and the evolutionary theory of the multinational corporation', *Journal of International Business Studies*, 24, 4, 1993, pp. 625–645.

Ernst-Olav Rühle
Essen
Germany

The Shaping of Automation: A Historical Analysis of the Interaction Between Technology and Organization 1950–1985

Dirk de Wit

Hilversum, Uitgeverij Verloren, 1994, 409 pp., f 69, ISBN 9 0655 0414 1

As its title indicates, this book traces the history of automation in the office, or 'automated data processing' as it was commonly called in the 1950s and 1960s, over the period from 1950 to 1985—specifically within three Dutch business organizations: the postal and telephone authority, the Giro bank (until 1986 a part of the former organization), and an insurance company. Under a central theme of 'organization and technology intertwined', it focuses on the dynamic interaction between technological development and organisational change: 'computer systems development is a result of the process of interaction between manufacturers and customers. This work focuses on the dual roles of organization and technology, mutually shaping and being shaped by each other' (p. 39). In order to investigate this interaction, de Wit uses an explicit 'heuristic framework' which serves multiple functions: '... as an aid to structure the search and order of the historical material; as a tool to compare the actions and reactions of the various organizations; and to provide description and explanation' (p. 41). It is an approach which is avowedly historical and interdisciplinary.

De Wit's framework derives from the social shaping, or constructionist, approaches to the study of technology which emerged in the 1980s¹ and which were inspired by