Science Policy and Research Management in the Balkan Countries

George Parissakis & Nikos Katsaros (Eds)

Dordrecht, Boston, London, Kluwer Academic Publishers, in cooperation with NATO Scientific Affairs Division, 1995, xiii + 236 pp., US$157.00, ISBN 0-7923-3599-6

Although geographers use the rivers of Sava and the Danube to define the northern boundary of the Balkan Peninsula, the group of the Balkan states had always been historically and politically determined. At the end of the 19th century it comprised a number of small nations which had recently won independence from the Ottoman Empire (namely Albania, Bulgaria, Greece, Moldavia, Montenegro, Romania, Serbia, Walachia and the Austrian provinces Bosnia and Herceogivina); after the Second World War it included the newly established socialist countries of Albania, Bulgaria, Romania and Yugoslavia as well as Greece and European Turkey. If your political knowledge is not up to date and you are wondering which are the Balkan countries nowadays after the collapse of the Eastern Bloc, this book will not provide you with an answer. It approaches the problems of science and technology policy by not focusing entirely on the region but by looking at the issues firstly, in Greece and Turkey, secondly, in some of the former centrally planned economies, namely Albania, Armenia, Bulgaria, Hungary, Moldova, Romania and Slovakia, and thirdly, by including some developed countries with long-lasting traditions in research and development (R&D), such as UK, US and the Netherlands. Fourthly, none of the countries of the war-torn former Yugoslavia is included. The emphasis of the book is however on the problems related to the transition to a market economy and its implications for R&D.

This publication is based on the proceedings from the Advanced Research Workshop on the same topic organised by NATO's Scientific Affairs Division and held in Athens, Greece in November 1994. My main criticism of the two editors, Parissakis and Katsaros, is that they have not provided the book with any structure and have left it without an introduction or conclusion which could have put into context and bound together some of the issues discussed by the individual authors. The majority of the contributors analyse the respective national science and technology institutional systems, presenting interesting R&D statistical information. Examples are the papers by Skende on Albania's exploding 'black hole' (p. 45) where R&D had recently become a priority; by Toia and Roman on Romania's 'high competitive potential' (p. 79) in R&D; by Kaymakalan on Turkey's consensus to 'increase exports by giving high priority to high technology sectors' (p. 107); by Havas on Hungary's efforts 'to start basically from scratch in introducing innovation policy' (p. 193); by Nedeva on the recent changes in the British science and technology system which include a steady decline in the number of researchers and in gross R&D expenditure (as a percentage of the country's GDP); and by McCullough on the governing principles in the US science system which had made it 'the strongest research system in the world' (p. 157). Other papers are more narrowly focused and look at the role of certain organisational structures (e.g. the Academy of Athens, universities and science parks in Greece) or particular technologies (e.g. photo-biotechnology in Moldova and information infrastructure in Armenia). In addition, the contribution by Jubier makes some clarification on NATO's 'third dimension' (distinctive from its political and military roles) to 'encourage interaction between peoples, to consider some of the challenges facing our modern society and to foster the development of science and technology' (p. 29). Only one of the total of 21 papers which form this publication, namely that by Armit on technology transfer, includes a section on what the implications are for the Balkan countries.

The style of presentation and the quality of the text in the different sections of the book vary significantly, as is most often the case with a compilation of conference proceedings without additional editorial improvements. The book however is of interest for those working in the field of comparative science and technology policy, not so much for what it has to offer about the developed and OECD countries (for which a vast literature already exists) but for its contribution to the area of transformation from centrally planned to market economies. It is one of the few publications in English which sheds light on the problems in science policy and research management in such parts of the world as Albania, Moldova, Armenia, Romania, Bulgaria or Slovakia. It also presents the opportunity for a closer look at the Greek science and technology system which is ranked first within the OECD by the level of external support (coming mainly from the European Union) and at Turkey's priority technologies, which include informatics, advanced materials, bio-, space and nuclear technologies (some comments about this are made later in this review).

It is my intention now to draw out some of the similarities revealed by the various authors in relation to the problems faced by their countries. The book provides more comprehensive and detailed description of national structures, budget allocations, research potential and government strategies. The following list is not organised in any other way than to give an overview of the issues.

With respect to R&D financing, the share of funds allocated to R&D in these countries is much less than the OECD average. Greece and Turkey traditionally had a low level of R&D expenditure and currently they are 0.47% of GDP for Greece (in 1994) and 0.33% of GDP for Turkey (in 1993). By comparison, the former socialist countries (with the exception of Albania where R&D statistics were not even collected) traditionally had a high level of R&D spendings, a quite significant proportion of which was for military research. The beginning of the transition period saw R&D becoming a 'luxury' in the countries' economic agendas and as a consequence the R&D funds were drastically cut (e.g. 0.47% of Bulgarian GDP, 0.70% for Romania, 1.3% for Moldova in 1991, 1% for Hungary in 1993). However, this is now being followed by a period of reconsideration of the importance and attempts to save the national science and technology systems in a situation of economic turmoil and financial shortages. Higher contributions from the private sector are seen as playing a major role in all countries. Another similarity are the high expectations placed on international funding for R&D projects (namely through the programmes operated by the European Union, OECD, NATO and the World Bank). Whether the former socialist states will manage to stop the intensive brain drain process and keep some of the R&D knowledge generation potential in-house is yet to be seen.

With respect to R&D system restructuring and rebuilding, institutional changes at the level of ministries and higher as well as changes in the legislative system are seen as top priority for almost all transitional economies. The new role of the Academies of Sciences and the recent autonomy of the universities are expected to bring positive changes in relating basic and applied research and research and teaching. The private sector's R&D strength as well as links between industry and universities and research centres are yet to be developed in any state, including Greece and Turkey. The attractiveness of the public research sector (including universities) is low compared to salaries offered by private companies which contributes to the deterioration of the image of science and requires government intervention.

In the area of change in R&D practices, many of the countries have adopted peer review processes in evaluating R&D projects and institutions. Networking, including electronic networking, is a new form of scientific international cooperation. Emphasis has

shifted from research institutions to individual R&D projects. Enforcement mechanisms are expected to be developed and used to deal with the protection of intellectual property.

With respect to science and human values, 'strategic research' no longer means laboratories with restricted access where new weapons are put to test or the space race is under way. In the developed world, it refers to social environmental concerns, such as public health and global warming. In Greece the emphasis is put on the amalgamation of social, environmental and economic issues with technology. This is not yet the case for even the most advanced transitional economies. Theocaris points out the importance of spiritual, moral and cultural values which is a big problem in most of eastern Europe. Another worrying fact is that nuclear technologies are still top research priorities in, for example, Turkey and Hungary (albeit for nuclear waste disposal research for the latter). Generally, most of the countries share the global environmental concerns and recognise the need for ecological aspects in research; but only very few government strategies include measures to deal with societal issues.

None of the papers in the book discusses the problems of defence-related research and research institutions. Not so surprisingly, there is also no mention of the role the wider community can play in establishing scientific priorities and shaping technological developments. Science and sustainable development is another non-existing issue. Nevertheless, putting science and technology on the economic and management agendas is a positive sign of change.

Havas writes about the tasks of transforming the national R&D system to facilitate innovation as being challenging and 'far more formidable . . . than, say, in the OECD countries' (p. 193) as it offers the opportunity to make it fair and actually to make it work. The book does provide some evidence that all the countries related to the Balkan region are engaged on a route to avoid the balkanisation of their science systems.

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Evolutionary Economics and Chaos Theory: New Directions in Technology Studies

Loet Leydesdorff & Peter Van den Besselaar (Eds)

London, Pinter Publishers, 1994, xi + 215 pp., £35.00 (hbk), £14.99 (pbk), ISBN 1-85567-1980 (hbk), 1-85567-2022 (pbk)

As it becomes more widely appreciated that central tenets of economics dogma are not only unsubstantiated but plainly wrong—from the idea of an all-knowing 'rational' man to the belief in a self-stabilising equilibrium macro economy—alternative concepts are being explored (not always by economists) with greater urgency. One of these is the metaphor of the 'evolutionary' economy, with which this book is concerned.

The book demonstrates how different are the research approaches to the 'evolutionary' economy; so different, that the book is broken into four major parts to reflect the differences. An important question for the general reader is whether these sub-areas have informed one another and whether there is a process of convergence around a common project. An epilogue chapter 12 pages in length by one of the editors, Loet Leydesdorff, claims to tackle the question 'is the whole more than the sum of the parts?' However,