
Editorial

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Biographical notes: Patricia Van Hemert is currently working as a Researcher at the Vrije Universiteit Amsterdam, Amsterdam, The Netherlands. She has a background in European Studies at the University of Amsterdam. For the Department of Spatial Science she participated in two European Commission Sixth Framework Programs: 'Dynamic Regions in a Knowledge-Driven Global Economy: Lessons and Policy Implications for the EU (DYNREG)' and 'Social Sciences and Humanities Futures (SSH Futures)'. Her research interests are in theoretical and empirical studies of innovation and entrepreneurship, and economic growth issues, and in policy studies concerned. She is currently publishing in four international papers and in one international volume.

Peter Nijkamp is Professor in Regional and Urban Economics and in Economic Geography at the Vrije Universiteit Amsterdam, Amsterdam, The Netherlands. His main research interests cover plan evaluation, multicriteria analysis, regional and urban planning, transport systems analysis, mathematical modelling, technological innovation and resource management. In the past years, he has focused his research, in particular, on quantitative methods for policy analysis, as well as on behavioural analysis of economic agents. He has broad expertise in the area of public policy, services planning, infrastructure management and environmental protection. In all these fields he has published

many books and numerous articles. He is member of editorial boards of more than 20 journals. He has been Visiting Professor in many universities all over the world. He is past President of the European Regional Science Association and of the Regional Science Association International. He is also Fellow of the Royal Netherlands Academy of Sciences, and is immediate past Vice-president of this organisation. Since June 2002, he serves as President of the governing board of The Netherlands Research Council (NWO). Also, he is President of the European Heads of Research Councils (EuroHORCs) as from 2005.

Dr. Roger R. Stough is Associate Dean for Research, Development and External Relations; NOVA Endowed Chair and Professor of Public Policy; Director, Mason Enterprise Center; and Director, National Center for ITS Deployment Research at George Mason School of Public Policy, Fairfax, USA. Also Roger Stough currently serves as President of the Regional Science Association International. Dr. Stough's educational background includes a BS in International Trade and Economics from Ohio State University; an MA in Economic Geography from the University of South Carolina; and a PhD in Geography and Environmental Engineering from Johns Hopkins University. He has an extensive publication record, including several hundred scholarly and professional publications, 12 books and nearly 100 journal articles. Dr. Stough has a wide range of graduate and undergraduate teaching experience, with over 30 years logged in eight separate institutions. He has been awarded over \$60 Million (US) in funding to support his sponsored research programmes, while the local National Capital Region is an empirical laboratory for much of his research. He has extensive research and consulting experience nationally and internationally. He has participated in Technology Policy seminars and university programmes and published widely in Asia, Europe and North America. Further, he has established a diversity of research, student and faculty research exchange programmes with universities and research laboratories in Asia, Europe and Australia. Finally, he founded and directed various degree programmes (from the undergraduate to the PhD level) and several research centres.

1 Introduction

Due to the influential papers by Paul Romer (1986) and Robert Lucas (1988) in the late 1980s, the interest in theories of economic growth regained importance in the academic literature, after having decreased considerably since the 1950s and 1960s. Theoretical and empirical research programmes soon followed (Nijkamp and Poot, 1997), leading to further and varying insights. As such, the neoclassical new growth theories did not go unchallenged (Scott, 1989). On the importance of the Schumpeterian forces of entrepreneurship, innovation and evolution, however, a general consensus was far more easily reached (Grossman and Helpman, 1994). This is reflected in new directions in regional policies (Nijkamp, 1991) and policies to encourage trade-driven national growth (Porter, 1990). Technical advances, notably in transport and communication, have lowered costs and fostered growth. Especially, ICT has helped to make growth in the current speed and scale possible, not only for goods but also for services. This has also speeded up the current economic integration, involving not only developed countries but also large emerging global players such as Brazil, China, India and Russia. As a result, an ever lower share of production is nowadays created within national boundaries and

domestic production increasingly relies on foreign inputs, as more than half (54% in 2003) of world manufactured imports are intermediate goods (OECD, 2007).

Small- and Medium-sized Enterprises (SMEs) have taken flight with the development of the knowledge economy. This interest in the role of the entrepreneur in driving economic development is strongly influenced by the endogenous growth revolution of the mid-1980s (De Groot et al., 2004). SMEs nowadays face important challenges in reaching international markets. Operating in a globally competitive market, whether through importing/exporting, offshoring or having affiliates abroad, will increase productivity of the firm. Management, finance and the ability to upgrade and protect in-house technology can however all be hurdles. As suppliers, SMEs are often given more responsibilities and more complex tasks than in the past. This places them under increasing pressure to merge with other firms in order to achieve the critical mass required to support research and development (R&D), training of personnel, control over firms in lower levels of the chain, and to fulfil requirements in terms of standards and quality. Knowledge, technology and intangible assets have become essential for any firm in order to remain competitive. As a result, investment in knowledge has increased in many countries, and focus is changing towards higher technology-intensive manufacturing industries and into knowledge-intensive market services. Developed economies can only grow by inventing new technology, by innovating products and processes and by designing new management methods.

Governments should foster and support the innovation process. Innovation policies, for example, can help increase the level of knowledge and technology embodied in production and exports. Policies to foster entrepreneurship and new areas of economic activity could help create new areas of economic activity, stimulate the creation of new firms and entrepreneurship or stimulate innovation in new areas. Further, policies to upgrade the human resource base of the economy can help meet the need for more highly skilled workers or a different mix of skills. Also, one can think of policies to enhance attractiveness of a country for economic activities, which can help attract foreign direct investment and foster new areas of economic activities. Cluster policies and efforts at the local/regional level could capitalise on local and regional strengths that are also an important asset for economic policy. And intellectual property rights related policies are also important. Striking an appropriate balance between diffusion of technology and providing incentives to innovation remains an important consideration. But spreading the benefits of globalisation appears necessary within countries, and also between developed and developing countries, particularly in Africa. Further trade liberalisation in sectors where poorer countries have a comparative advantage, especially agriculture, complemented by capacity-building and development policies, may help spread the benefits of globalisation.

Globalisation has introduced both opportunities and uncertainties. In the literature, overall, the historic strength of innovation is noted and that invigorating this capability is the key to future prosperity. The resulting recommendations are focused towards a 'network' of interrelated institutions, laws, regulations and policies providing an innovation infrastructure that entails education, research, tax policy and intellectual property protection, among others. This network, however, is still far from secure. Most importantly, this seems caused by the fact that its components are created in the context of old technologies, not new or future ones. Also, the processes for updating them are incremental, and we do not stand back and ask whether our changes are achieving the intended outcomes enough. To truly prosper, an international process is needed that can,

time after time, fundamentally rethink the elements of our innovation network system. International academic research may prove of great value in this process. International scientific cooperation stimulates ideas and improves efficiency by sharing financial resources, information and facilities. Besides, cooperation with developing countries can help rebuild research capacity by providing access to world-class training and knowledge and thus help to stem the 'brain drain'. Continuing progress in biotechnology, nanotechnology and ICT promises further improvements in living standards and economic performance. Such benefits will not, however, occur without strong commitment to research. With this paper, we hope to contribute to the discussion. Overall, the articles in the Special Issue can be subdivided into three parts. The first part deals with the drivers of innovation, R&D and entrepreneurship behaviour and their dynamism. The second set of papers discusses in more detail the actual processes of innovation, R&D and entrepreneurship, while the third and last part investigates the societal (demographic, cultural) influences of dynamic knowledge-intensive growth.

2 Contents of the Special Issue

The links between science and innovation have tended to be forged at the national level, initially structured around national research organisations and domestic firms. International links were mainly created through the scientific community. This situation evolved through the 1970s and 1980s as government-sponsored international cooperation in technological development intensified, especially within Europe. The more recent globalisation of firms' R&D strategies and access to public research, together with the increased mobility of scarce high-qualified labour, are leading to much more fundamental changes, as will be shown in the first set of articles of this Special Issue. Inklaar, McGuckin, Van Ark and Dougherty look into the implications that cross-border flows of R&D expenditure have for the organisation of R&D process and the international dispersion of R&D activities. They find that the drivers of internationalisation differ substantially between research on the one hand and development on the other, research usually being concentrated in a single location, mostly near the firms headquarters, while development is generally tied to individual business units and more likely to be located to support production locations.

International cooperation is also needed to realise science and technology's full potential to enhance global sustainability. De Noronha Vaz and Cesário refer to this when discussing the presence of causal links between a number of variables and the firms' and regional performance towards different forms of innovation. Hereby they show the advantages that may result from factors such as institutional proximity, knowledge diffusion and coordination for the specific building up of a territorial knowledge base and its consequent effect on sustainable regional development. As such, the causal links can bring greater understanding of innovation, while at the same time providing policy-makers with a support instrument for the search for specificities in the regional development process. Van Hemert looks more specifically at the characteristics of entrepreneurship behaviour and their effect on sustainable economic growth. Academic literature supposes a different role for entrepreneurship in different phases of economic growth. The article distinguishes three stages: the institutional stage, the entrepreneurial stage and the innovative stage, whereby, overall, it can be said that developing countries

thrive by a different form of entrepreneurship than developed countries. A finding that may again be interesting for policy-makers.

The second set of articles focus deeper on the new forms of often knowledge-intensive entrepreneurship that have emerged, their effect on economic growth and what may be done to improve knowledge-intensive entrepreneurship behaviour. Nowadays, many regions that were historically production centres are losing out to lower cost locations and are reorientating their activities to higher value-added non-manufacturing industries or R&D-intensive manufacturing niches. ICT plays an important role in many of these changes in the innovation process and the 1990s witnessed rapid accumulation of ICT hardware and software. Some of these upstream activities have even begun to be off-shored to lower-cost and developing countries. The question for policy-makers now is how durable the competitive strengths are on which those regional economies are based. Mazurencu-Marinescu and Nijkamp look into this question by addressing the lack of attention that is as of yet dedicated to the valuation of e-business in emerging markets. By looking at the existing literature in the field of e-business, they have tried to develop a solid and practical methodology for valuing e-businesses in emerging markets, using Romania as a case study. Because, although a vast literature is dedicated to financial valuation techniques for a wide spectrum of companies in established markets and to appropriate valuation techniques adapted to emerging markets, there is thus far hardly any attention dedicated to the valuation of e-business firms in emerging markets.

Entrepreneurship differs in countries with different levels of development, but also tends to vary across regions within a country. Some regions or locales generate high levels of entrepreneurial activity through clusters of dynamic firms, while other areas tend to lag behind. Companies can no longer cover all relevant disciplines, as many key developments draw on a wide range of scientific and commercial knowledge. The need for cooperation among participants in different fields of expertise has become greater in order to reduce uncertainty and share costs and knowledge. Governments now stimulate cooperation among firms and between firms and research institutes, with a view to fostering synergy effects and better exploiting their economies' innovative potential. Van Geenhuizen and Soetano recognise this, but also point to the fact that there is a need to evaluate Science Parks to improve their efficiency. The studies conducted so far have produced outcomes that are either not conclusive or only in part positive, and therefore they propose a more refined approach to evaluate the impacts of Science Parks that take into account both the diversity in Science Parks and the Science Park paradox of the extreme popularity of the Parks as a policy tool despite its rather poor proof of success.

In such an environment, intellectual property rights, particularly patents, are increasingly important for science and innovation, as they influence the distribution of financial returns to innovation, as well as the ease with which others can obtain access to and use new technological discoveries. Over the past two decades, patent rights have been strengthened and extended. Although differences remain between countries and geographical regions, patents now cover software, genetic and business method inventions, and procedures for registering patents have been made more flexible and less costly, particularly, at the international level. The introduction of new governing bodies, usually with more power to enforce rights, such as the World Trade Organization and the World Intellectual Property Organization has been coupled with stronger enforcement of patent holders' rights in the courts. But not all patent processes run smoothly yet. Batabyal and DeAngelo hereby refer to the concerns that are raised by researchers about the current patent approval process by the United States Patent and Trademark Office.

They find that the processing of applications takes too long and examiners make too many errors in the approval process. The first concern suggests that examiners ought to be less stringent in their decision-making, whereas the second concern suggests the opposite. By asking whether a more stringent examination of applications always lengthens the pendency period, they however also come to different conclusions. While for many values that describe the stringency of examinations, a more stringent examination process lengthens the pendency period, for most values that describe the volume of patent applications, however, a more stringent examination process does not lengthen the pendency period.

The third part consists of articles that look at the societal effects of innovation and economic growth. Today migrants move quickly and easily, thanks to low-cost transportation, internet, affordable telephony and satellite television. Globalisation, meanwhile, has radically transformed our labour markets, while growing economic inequality together with natural and man-made crises prompt more emigration. Poot is aware that regional demographic change can have a significant impact on regional competitiveness and that such change is often more rapid and profound than at the national level. By looking at the impact of population ageing and immigration, he finds that there is empirical evidence that population ageing reduces regional competitiveness, while immigration – particularly of entrepreneurs and highly skilled workers to metropolitan areas – enhances competitiveness. He however also comes to the conclusion that rigorous econometric research is still rare and should be promoted. Flytzani and Nijkamp also take a closer look at the international labour mobility, but from a different perspective, namely, the success and failure conditions of migrant workers. They investigate the performance of expatriate managers by explaining their cross-cultural adjustment potential from their personal management style features, and come to the conclusion that managers with an internal locus of control are more successful in coping with the difficulties inherent in adjusting to a foreign culture than managers with an external locus of control.

Together with broader labour market and education policies, science and technology policies can help address challenges such as shortages of science teachers or researchers and barriers to mobility. But the right conditions have to be put into place to stimulate business investment in innovation and provide incentives for students to pursue education and careers in science and technology. These conditions include effective venture capital markets, regulations that facilitate firm entry and exit and more broadly a business climate that rewards risks. That a supportive and stimulating environment is indeed very important for successful entrepreneurship is affirmed by the last article. Osoba investigated the influence of religious adherents on cross-state differences in production growth in the USA, and finds that the concentration of Jewish adherents has a positive and significant effect on interstate differences in economic growth, while the concentration of Liberal Protestants tends to negatively affect economic growth. This implies that not only should policy-makers invest in the right set of skills and well-functioning product and capital markets, but that sustainable growth also requires a more general ‘state of mind’ that all possibilities are open and free to all. Only then can economic growth really become sustainable.

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