
Editorial

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Biographical notes: Alexander Brem received his Diploma in Business Administration from the University of Erlangen–Nuremberg in 2004, and earned his PhD from the same university in 2007. From 2004 to 2007, he was a Senior Research and Teaching Assistant at the Chair of Industrial Management, University of Erlangen–Nuremberg, where he now works as Assistant Professor. Moreover, he is the Founder and Partner of VEND Consulting GmbH, Nuremberg. His current research interests include idea and innovation management and strategic management in SMEs; he is the Reviewer and Editorial Board Member of various international journals, such as *Technovation* and *Int. J. Innovation Management*.

Jens Horbach is Professor of Economics at the University of Applied Sciences in Augsburg. His recent major research fields are econometric analyses of eco-innovations and their respective employment effects. He has published many papers in international journals such as *Research Policy* and *Ecological Economics*. During the last ten years, he has been involved in international projects like an OECD project on ‘Environmental Policy and Corporate

Behaviour' covering seven countries. Furthermore, he has worked on conceptual issues on eco-innovation within an EU project on measuring eco-innovation.

Klaus Rennings has been Vice Head of the Research Department 'Environmental and Resource Economics, Environmental Management' of the Centre of European Economic Research (ZEW) since 1994. His main fields of research are eco-innovation policies and analysing determinants and economic impacts of environmental innovations. He has published many articles and papers in journals, such as *Ecological Economics* and *Journal of Evolutionary Economics*. He has been an experienced Leader of large national and international projects for more than ten years. He is a Member of the Committee of Environmental and Resource Economics of the German Economic Association (Verein für Socialpolitik). He is leading the research group 'Innovation and Sustainable Development' at ZEW.

1 Introduction

Innovations do not fall like manna from heaven but are generated by pioneering activities of human beings. These activities have to take place via interaction with all kind of institutions and the regulatory framework of their individual business environments. Traditional innovation theory embedded in growth theory or industrial economics often neglects the influence of the regulatory framework on innovations.

In the context of the growing importance of institutions, such as the World Bank or the European Union, the influence of laws and all other kinds of regulation keeps on growing. Hence, regulation is often seen as a substantial barrier for innovative activities. But, especially in growing research fields like environmental innovation, empirical evidence has shown a strong positive influence of regulatory measures on encouraging innovative activities. The same can be expected for other regulated markets, e.g. health services. And regulation may also be relevant in more traditional markets, e.g. due to the increasing role of consumer protection and policy.

In particular, environmental protection encourages innovation as, for instance, car manufacturers must think about new ways of driving concepts in the light of permanently increasing energy costs, changing consumer perceptions and increasingly limited natural resources worldwide. Therefore, the aim of this Special Issue is to clarify the role of regulation in innovation processes and to assess its impacts.

Potential authors were invited to submit contributions analysing the role of regulatory issues in the management of technology and innovation. The goal was to prepare a reference issue that could be of immediate use to those interested in the management of technology and innovation and its implications, whether they are academics, practitioners or researchers.

As a result, based on two rounds of reviews, the second being double blinded, papers in this issue were selected from 12 initial proposals from Europe, South America and China. We feel that the chosen papers represent a variety of ideas and implications that can be put to instantaneous use.

Due to the nature of environmental innovations as being dependent on regulation, most of these papers deal with eco-innovation policy. The first paper, by Berkhout, reflects an eco-innovation workshop that was held in Mannheim in October 2010. It

outlines the evolving research agenda workshop. In fact, over the past ten years, eco-innovation policy has evolved from an idea to a quite segmented field of policy and research.

The second paper, by Jänicke and Rennings, describes success stories of renewable energies and energy efficiency policy, i.e. where targets were not only reached, but also be tightened over time. It explains this phenomenon by the intelligent target setting.

The subject of the third paper, by Grünhagen and Berg, develops a model of regulatory and policy effects on innovation-based growth intentions of entrepreneurs. The results suggest regulatory complexity and reliability and the degree of policy supportiveness as the central influence constructs on the perceived feasibility and desirability of growth aspirations. For innovation and entrepreneurship policy, several implications are presented.

Paper four, by Rogge, Schleich, Haussmann, Roser and Reitze, is the relevance of the regulatory framework for innovation activities in the German paper industry with a focus on climate policies. Their findings suggest that innovation activities are mainly governed by market factors and (as yet) are hardly affected by the European Emissions Trading System and other climate policies. However, this result may also be explained by the early state of the European emissions trading system.

Paper five, by Rennings and Rexhäuser, analyses two aspects of environmental regulations triggering eco-innovations. Firstly, whether there are long-term effects of regulation on innovation. Secondly, whether the impacts of different types of regulation differ by type of the environmental benefit of the innovations. They find evidence for long-term effects of environmental regulation on innovation.

The subject of the sixth paper, by Zaby, is the EU's legislative framework on orphan medicinal products in terms of the deliberations prior to its enactment as well as the key criteria, institutions and procedures established by it. This paper examines the economic incentives created for stimulating innovation by pharmaceutical companies for treating rare diseases. Moreover, the EU framework is compared to the US Orphan Drug Act and critical perspectives are discussed.

Paper seven, by Vasseur and Kemp, compares eco-innovation policy in the Netherlands and Germany regarding renewable energies, especially the evolution of the technological innovation system and diffusion of solar photovoltaic panels (PV). They find that within both countries policy has changed over time but that the German feed in law provided an element of continuity which the Dutch policy lacked. According to Vasseur and Kemp, the creation of a successful industry for PV in Germany can be attributed to the greater consistency and continuity of the German policies.

Finally, the paper by Cainelli, Mazzanti and Zoboli, stresses the important role of networking with other firms and institutions, strategic relationships within regions and especially international characteristics such as foreign ownership for the adoption of eco-innovations. These factors seem to be more important than general research and development. In line with the Porter hypothesis, the results of the econometric analyses also show that eco-innovations are advantageous for economic performance.

As a result, it is not difficult to conclude that the theoretical and empirical understanding of the role between regulation and innovation is still a moving target. Relevant pieces of the puzzle have been put together by environmental and innovation economists, industrial ecologists and policy analysts. A more coherent theoretical approach still has to be developed.

Acknowledgements

We would like to thank our engaged anonymous reviewers for their comments that helped substantially to improve the quality of the contributions. Finally, we are grateful to the Journal Editor-in-Chief of *IJTPM*, Kurt J. Engemann and the editorial team (Jane Lunnon, Jeanette Brooks and Jim Corlett) for the support and encouragement.

The authors warmly welcome any feedback to this Special Issue of the *Int. J. Technology, Policy and Management*.