

Acknowledgements

This book is, in part, an update of Gault (2010), taking account of the issues raised there, and how they have changed over a decade, or not. Given that the book is about statistical measurement of innovation, and the influence of the resulting indicators on innovation policy, the biggest change has been in the definition of innovation.

The fourth edition of the *Oslo Manual* (OECD/Eurostat 2018) introduced a general definition of innovation applicable in all economic sectors. This was a big step and I was able to participate in the discussions as a result of a grant from the Government of Norway facilitated by Sven Olav Nås, then the Chair of the Organisation for Economic Co-operation and Development (OECD) Working Party of National Experts on Science and Technology Indicators (NESTI), and managed by Fernando Galinda-Rueda at the OECD.

The discussion of a general definition goes back some time. In the course of a Finnish project on consumer innovation, led by Jari Kuusisto and Eric von Hippel, the fact that ‘user innovators’ that shared their new or significantly improved product with peer groups, or communities of practice, were not innovators was a concern. The issue was that these ‘user innovators’ did not connect to the market. I am indebted for the spirited discussion that followed. I proposed a way to resolve this and the solution was to change ‘introduced on the market’ to ‘made available to potential users’ Gault (2012). In the course of examining the consequence of using ‘made available to potential users’ it became clear that it could be applied to the public sector. The results of the Nordic MEPIN project on public sector innovation were examined with valuable input from Carter Bloch. This work on definitions would not have gone ahead had it not been for the contributions of Carter Bloch, Eric von Hippel and Jari Kuusisto. The next step was to deal with all economic sectors in a coherent manner.

At the same time as these discussions were going on, I was editing the *Handbook of Innovation Indicators and Measurement* (Gault 2013). The contributors to that book provided ideas for the revision of Gault (2010), once the debate on the general definition of innovation was resolved.

I am indebted to Erika Rost, a former Vice-Chair of NESTI, for her suggestions for structuring an updated version of Gault (2010), incorporating findings from the *Handbook* and other sources.

In 2015 the revision of the *Oslo Manual* began and a UNU-MERIT Working Paper (Gault 2015) was made available to members of NESTI, past and present, who were engaged in the revision. The discussion of general definitions by NESTI delegates and experts contributed significantly to the understanding of a general definition which was published in 2018 (Gault 2018). The general definition in that paper was not exactly the same as the one in the fourth edition of the *Oslo Manual*, but the *Oslo Manual* achieved the objective of having a general definition of innovation. All of the NESTI delegates contributed to that.

Outside of NESTI, the concept of the general definition was attracting interest. There were discussions among participants in the African Science, Technology and Innovation Indicators (ASTII) initiative led by Aggrey Ambali, and the African Observatory on Science, Technology and Innovation (AOSTI) led by Philippe Mawoko with Almammy Konté. The author has had a long-standing relationship with the Centre for Science, Technology and Innovation Indicators (CeSTII) initiated by Michael Kahn in 2002 and continued with Glenda Kruss. It has always been a pleasure to work with the CeSTII team and the Human Sciences Research Council. I thank Rasigan Maharj for my association with the Tshwane University of Technology (TUT) in Pretoria and the Institute for Economic Research on Innovation (IERI). More recently, I thank Erika Kraemer-Mbula, who holds the DST/NRF/Newton Fund Trilateral Research Chair in Transformative Innovation, the 4th Industrial Revolution and Sustainable Development at the University of Johannesburg, for my involvement with that group.

Well before the decision to revise the *Oslo Manual* in 2015, the US National Research Council convened, in 2011, a Panel to review the question of *Capturing Change in Science, Technology, and Innovation: Improving Indicators to Inform Policy*. I participated at the invitation of the co-chairs, Robert E. Litan and Andrew W. Wyckoff, and the report (National Research Council 2014), remains relevant to this day. Kaye Husbands Fealing managed the Panel and more recently provided insights on the future of the NSF Science of Science and Innovation Policy (SciSIP) programme. As part of the US ongoing work on indicators, John Jankowski, the current Chair of NESTI, invited me to contribute to an NCSSES/CNSTAT event, chaired by Scott Stern, on *Advancing Concepts and Models of Innovation Activity and STI Indicator Systems at*

the National Academies of Sciences, 19–20 May 2016 in Washington. As with the report just cited (National Research Council 2014), the resulting report (National Academies of Sciences, Engineering and Medicine 2017) considered different ways of measuring innovation.

The OECD Blue Sky Forum in 2016 contributed to the discussion that was part of the revision of the *Oslo Manual*. I thank Ward Ziarko, another former Chair of NESTI, and the organisers of the Forum, for their invitation to take part.

Over a decade, I benefitted from discussions with Bengt-Åke Lundvall, Charles Edquist and John Marburger on different aspects of innovation indicators and their use. The Science Policy Research Unit (SPRU) has played a role from the beginning of this project through discussions with SPRU researchers. I particularly thank Ben Martin.

The book is about innovation policy as well as statistical measurement and I am indebted to Manuel Heitor, Minister of Science, Technology and Higher Education in Portugal for discussions organised by Joana Mendonça and Giorgio Sirilli, another former Chair of NESTI.

Lili Wang, of United Nations University – Maastricht Economic and social Research and training centre on Innovation and Technology, the Netherlands (UNU-MERIT), has promoted discussion of indicators and their development, including the impact of a general definition of innovation, which contributed to this work.

While there have been many meetings over the last decade looking at definitions of innovation, there was another activity growing rapidly which was the digital economy. This raised measurement questions addressed by the OECD in *Measuring the Digital Transformation: A Roadmap for the Future* (OECD 2019a). It was presented to me by Alessandra Colecchia with the suggestion that I read it. The text will demonstrate that I did.

Another topic which overlapped with the general definition of innovation was the *Maastricht Manual on Measuring Eco-Innovation for a Green Economy*. This was given to me for review and it is a very ambitious project, led by René Kemp, that should make statisticians and policy people think. It is discussed in Chapter 8.

Anthony Arundel and Carter Bloch provided useful comments on earlier work as did students of a course I give occasionally at UNU-MERIT. It has been a privilege to have been a Professorial Fellow at UNU-MERIT for over a decade and I am indebted to Luc Soete for appointing me in 2009 and Bart Verspagen for his leadership of

UNU-MERIT for the last eight years. I was supported by Eveline in de Braek and Marc Vleugels in various projects leading to this book.

Books are always a challenge and I wish to thank Edward Elgar Publishing for its corporate support, Matt Pitman for being both encouraging and accommodating and Stephanie Hartley for her guidance.

While there have been many inputs and useful comments, the final text and any errors are the responsibility of the author.