CHAPTER 1

Introduction

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The key role of innovation as a driver of economic development was first described by Schumpeter (1934). In current times, there is widespread consensus among academic economists and policymakers, that research and development (R&D) activities play a decisive role in fostering growth in productivity and, hence, in the standards of living, as innovation intensive industries create highly skilled jobs, exhibit higher wages, are more productive, are often export-led and enhance competitiveness during the thick and thin of business cycles.[1]

The productivity growth slowdown in Europe and other advanced economic blocs experienced since the 2008–2009 economic and financial crisis has further reinforced the interest of policymakers in promoting innovation. Improving innovation performance is complex, not least because of the numerous actors and pieces of the innovation system

[1] See, among others, Kumar and Sundarraj (2018).

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involved. Thus, the intricacies surrounding the promotion of innovation, and especially the best approaches to fostering it, play a central role in the European Union's policy landscape. Testament to this are profound debates such as the ones reflected in the European Union's Europe 2020 strategy, which emphasise R&D and innovation as essential means to achieving the overarching goals of jobs, growth and sustainable development. The emphasis of the Europe 2020 strategy is notably on 'improving the conditions for innovation, research and development' (European Council, 2010), with the specific objective of 'increasing combined public and private investment in R&D to 3% of GDP by 2020' (European Commission, 2014).

In the innovation policy debate, the following topics usually take centre stage: (i) best policy practices to spur innovation by the private sector with as large society-wide impacts as possible, (ii) technology diffusion (both across countries and firms), (iii) the apprehension of disruptive innovations, and ways to promote them, iv) the role of non-R&D innovation, v) the role of public versus private R&D.[2] For the specific case of the EU, the most pressing innovation challenges identified include: increasing knowledge-intensive industrial activities, improving access to finance in high growth, highly innovative activities, strengthening the role of higher education institutions in local innovation ecosystems and improving the governance of research and innovation systems.[3]

The increased interest of policymakers in innovation has naturally been accompanied by an increasing need to evaluate the impact of policy measures. EU funding instruments such as the Framework Programme (FP) for research and the regional Europe Structural Investment Funds (ESIF) include legal requirements to collect data on implementation and to undertake evaluations at certain stages of the implementation (mid-term/ex-post, for example). Measuring the impact of innovation is an intricate question compounded by the often relatively long lag between policy initiatives and observed actual impacts. In addition to indicator-based approaches, such as the European Innovation Scoreboard, there has also been mounting interest in undertaking macroeconomic assessments of the impacts on GDP, imports, exports, employment at the EU,

[2] On this last point, see, among others, Mazzucato (2018).

[3] For the most salient documentation on these issues, see European Commission (2015), European Commission (2016), European Commission (2017) and European Commission (2018).

national and regional levels (European Council, 2010). This has provided further momentum to conducting research on the modelling of R&D and innovation policies as an additional way to quantifying the economic impact of innovation policies.

This reader is aimed at bringing to the forefront the latest empirical and theoretical insights stemming from the most recent literature related to the modelling of the macroeconomic impact of R&D policies. The content of this book is thus relevant both to academic and policy-related audiences working in the fields of R&D and innovation. As such, it is a wide-encompassing manuscript containing clear messages and results in the area of R&D and innovation policy and their macroeconomic impact and modelling.

Specifically, the purpose of this volume is threefold. First, to dissect the most relevant empirical facts to date on innovation and growth, and their consequences for policy. Second, to provide an overview of the state-of-the-art of macroeconomic models featuring innovation channels, the new elements of this narrative and their drawbacks. Third, to briefly discuss the models that have been implemented to analyse some of the most relevant innovation policies managed by the European Commission, including succinct examples. Fourth, to bridge the technical discussions offered with precise suggestions on fruitful ways forward, with a view to tackling the most pressing policy demands.

These and other similar questions were the subject of a workshop jointly organised by the International Economic Association and the European Commission's Joint Research Centre in March 2017. Distinguished academics and Commission officials participated and discussed different modelling approaches and issues for modelling R&D and innovation. This book is an off-spring of the discussions in this workshop, and it includes its proceedings.

The book is divided into three parts. In line with the aforementioned objectives, the first part is devoted to overviewing the latest theoretical and empirical contributions in the field of the macroeconomic modelling of R&D and innovation policies.[4] In particular, Chapter 2 overviews the most recent empirical literature and its implications for innovation policy.

[4] Please note that since January 2020, the UK is no longer a member of the EU. However, the contents of this book were written at a time when this status was still not officially recognized. The authors and editors have thus decided to include the UK as part of the EU in all the discussions contained in this reader

Chapter 3 delineates where the literature on DSGE models with innovation dynamics currently stands, the main ingredients of these models, and the paths that the academic literature in this area is set to follow. Chapter 4 presents a succinct summary of the Proceedings of the joint IEA-JRC workshop on 'Macroeconomic Modelling for R&D and Innovation', held in Brussels in March 2017. Part II of the book presents concise overviews of the different macroeconomic models that have been used for innovation policy evaluations by the European Commission in the past. Some examples of such evaluations are also provided, together with brief discussions on them. Finally, Part III presents the main conclusions on the macroeconomic modelling of R&D and innovation policies, and the potential ways forward.

References

European Commission. (2014). *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*. COM/2014/0130.

European Commission. (2015). *State of the innovation union*. ISBN 978-92-79-52969-6, https://doi.org/10.2777/805999KI-01-15-871-EN-N.

European Commission. (2016). *Better regulations for innovation-driven investment at EU level*. Commission Staff Working Document. ISBN 978-92-79-51529-3, https://doi.org/10.2777/987880KI-04-16-030-EN-N.

European Commission. (2017). *Current challenges in fostering the European innovation ecosystem*. EUR 28796 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73862-3, https://doi.org/10.2760/768124, JRC108368.

European Commission. (2018). *A renewed agenda for research and innovation—Europe's change to shape its future*. The European Commission's contribution to the informal EU leaders meeting on innovation. Sofia, 16th of May 2018.

European Council. (2010). *European council conclusions*. 17 June. EUCO 13/10, Brussels, 2010.

Kumar, V., & Sundarraj, R. P. (2018). The Economic Impact of Innovation. In S. Nature (Ed.), *Global innovation and economic value*, Vol. 2, pp. 49–93.

Mazzucato, M. (2018). *The entrepreneurial state*. Penguin Books ISBN 9780141986104.

Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. New Brunswick, New Jersey: Transaction Books. ISBN 9780878556984. Translated from the 1911 German original *Theorie der wirtschaftlichen Entwicklung*.