1. Introduction to the *Handbook of Quantitative Research Methods in Entrepreneurship*

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The availability of economic, financial, and business data, and their use in empirical scientific entrepreneurship research, has increased significantly in recent decades. The ever-increasing number of researchers looking for answers to important scientific questions, usually followed by political implications that shape people, firms, and societies, and the use of econometrics and statistics as a means of analysing different forms of data, make it increasingly necessary to provide a handbook that can act as an information guide for quantitative analysts and those interested in quantitative entrepreneurship research. However, it is a rather difficult task to produce a handbook that contains all the methodologies and ongoing discussions about quantitative research and methods in entrepreneurship. Any such quantitative work should be approached with thoughtful statistical analysis together with a full understanding of the strengths and weaknesses of the methods and data employed, and should thus be able to analyse the contribution to, and challenges imposed for, future research. Hence, this handbook cannot replace important technical econometrics and statistical textbooks, as well as research articles that the quantitative entrepreneurship analyst should read and/or consult. This handbook, in contrast, focuses on a number of important empirical issues related to entrepreneurship and should assist and be considered as a complementary resource for those who wish to pursue empirical work in the entrepreneurship field.

Specifically, this handbook represents the combined research efforts of 31 scholars of international standing and repute in the field of entrepreneurship; or put another way, the combined knowledge of over 1,000 people years spanning some 17 countries across the globe. Given the breadth of subjects covered, we believe that it has wide appeal and relevance, and can be read on several levels. For undergraduate students, it can be an informative and easily accessible introduction to a wide range of subjects related to the phenomenon that is entrepreneurship.

2 *Handbook of quantitative research methods in entrepreneurship*

These include: business survival, sustaining growth, job creation, internationalisation, public policy, bank financing, venture capital, and specific types of entrepreneurial activity such as social enterprise and family business. For postgraduate students, it also provides an excellent introduction into *how* scholars conduct applied quantitative research in entrepreneurship and the methodological approaches that they take. Established academics can simply view it as a series of state-of-the-art research papers on some key topics in entrepreneurship. Finally, policy-makers can use this book as a knowledge repository to draw upon when they are deliberating the *when* and *how* of public interventions in the entrepreneurial arena.

The handbook can also be used as a practical guide for those wishing to conduct applied research using quantitative methods, as it covers many of the most prevalent and commonly used research methods. For students, and early-career researchers, it will help in avoiding many of the pitfalls that are frequently encountered in applied research. For example, Siepel and Dejardin (Chapter 2) highlight the importance of choice of outcome measures, and discuss different types of data in the context of missing data, measurement error, and data structure. Capelleras, Rialp, and Rialp (Chapter 3) use fixed effects (FE) panel data models. In Chapter 4, Ferreira deals with transitions into multiple potential states using a competing risks and latent variable approach. Medaugh, Stanley, Kellermanns, and Zellweger's chapter (5) contains a detailed consideration of fundamental differences between the *variable* and *configured* approaches. Chapter 6 focuses on social enterprise, with Robinson outlining the definitional considerations and discussing the types of data that are available to researchers interested in this phenomenon. Lai, Saridakis, and Hand (Chapter 7) identify meta-analysis as a key element in the legitimisation of theory. In Chapter 8, Roper discusses the practical applications of Randomised Control Trials (RCTs) as a means of evaluating the efficacy of policy interventions. Urwin and Buscha (Chapter 9) consider multinomial logit models as an efficient method for mapping out and understanding labour market transitions. In Chapter 10, Hain and Jurowetzki discuss state-of-the-art methods, including Machine Learning, and highlight the potential of Big Data for enhancing future research efforts. The last four chapters get into the nitty gritty of modelling when selection and treatment effects are present. To begin, Rostamkalaei and Freel (Chapter 11) take a broad and detailed look at endogeneity, selection effects, and omitted variable bias, and consider whether previous research has fully addressed these issues, whilst Pennacchio and Sapio (Chapter 12) use a maximum likelihood (ML) Heckman selection approach to model treatment and selection effects in

the context of firm growth and venture capital (VC) funding. In Chapter 13, Han, Tian, and Mi use a special form of modelling that deals with binary and conditional outcomes. The final core chapter from Cowling and Yue (Chapter 14) uses an ML algorithm to estimate endogenous switching regression models; this allows firms not only to choose their favoured starting regime, but also to estimate what would happen to them if they moved regimes.

Overall, the handbook provides a synthesis of useful and interesting methods and approaches related to quantitative analysis of research on entrepreneurship. In times of increasing availability of data, and powerful econometric and statistical packages that handle large amounts of data and carry out advanced statistical computation, there would be an increasing interest from all spheres to unpack the information hidden in the data. This handbook is a timely and useful tool in the hands of the researchers and scholars in the field of entrepreneurship. We hope that this handbook assists, not only in providing a better understanding of some of the empirical issues and methods in entrepreneurship research, but also in encouraging non-quantitative researchers to experience the powerful world of data analysis, which, through statistical and econometric modelling, can examine existing entrepreneurial theories and test the appropriateness of new ones. If the reader deems that we have achieved this after reading the handbook, it has served its purpose.