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0521553598 - Probability, Econometrics and Truth: The Methodology of Econometrics

Hugo A. Keuzenkamp

Frontmatter

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When John Maynard Keynes likened Jan Tinbergen's early work in econometrics to black magic and alchemy, he was expressing a widely held view of a new discipline. However, even after half a century of practical work and theorizing by some of the most accomplished social scientists, Keynes' comments are still repeated today.

This book assesses the foundations and development of econometrics and sets out a basis for the reconstruction of the foundations of econometric inference by examining the various interpretations of probability theory which underlie econometrics. Keuzenkamp contends that the probabilistic foundations of econometrics are weak, and, although econometric inferences may yield interesting knowledge, claims to be able to falsify or verify economic theories are unwarranted. Methodological falsificationism in econometrics is an illusion. Instead, it is argued, econometrics should locate itself in the tradition of positivism.

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Introduction

Probability begins and ends with probability.

Keynes ([1921] CW VIII, p. 356)

When John Maynard Keynes accused Jan Tinbergen of practising black magic and alchemy, econometrics was still in its infancy. A critical attitude to econometrics was legitimate, as it would have been for any novel enterprise. Stubborn perseverance on behalf of the pioneers of econometrics is natural as well. However, after more than half a century of development by some of the most brilliant social scientists, and much practical experience, Keynes' comments are repeated today by respected authorities. Has it all been in vain?

Not quite. It is true that the aspirations (or pretences) of econometrics and the accomplishments still tend to be divided by a gap, which, in turn, tends to damage the credibility of the whole discipline. Many of econometrics' results remain controversial. Some critics claim that even the most basic aim, the measurement and quantitative description of economic phenomena, has not been accomplished. Econometric evidence has been compared with the evidence of miracles in Lourdes. Some deplore the waste of electricity used for econometric computer calculations. But a fair appraisal of contemporary econometrics cannot deny that a number of interesting empirical lessons have been learnt. The verdict that the econometric exploration was all in vain can only result from a wrong interpretation of econometric aims.

This book is a methodological investigation of this exploration. It confronts the aims with the methods and with the philosophical as well as the probabilistic foundations of those methods. It concludes that the achievements of econometrics can be found where its aspirations are put in the positivist tradition. Positivism is a philosophy which has been declared dead by many. It should be resurrected.

Positivism has an ancestor in David Hume, one of the founders of British empiricism (the forerunner of positivism). Hume ([1748] 1977, p. 114) encouraged his readers to ask about any book in their libraries,

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Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames: For it can contain nothing but sophistry and illusion.

‘Science is Measurement’, the original motto of the Cowles Commission for Research in Economics (which had a leading role in shaping formal econometrics), put econometrics clearly in the positivist tradition. Twenty years later, in 1952, this motto was changed to ‘Theory and Measurement’, reflecting the ambitions of a younger generation of researchers (headed by Trygve Haavelmo and Tjalling Koopmans) to integrate econometrics with (neoclassical) economic theory and formal probability theory. The new tradition diverted econometrics to Neyman–Pearson testing procedures, away from the positivist tradition of Karl Pearson (father of Neyman’s companion Egon), Fisher and Jeffreys. Simultaneously, in the philosophy of science positivism came under attack and was replaced by methodological falsificationism. Chapter 1 discusses this philosophy, chapters 2 to 4 deal with different approaches in probability theory. I claim that the Cowles programme in econometrics, with its Neyman–Pearson foundation and a philosophical sauce of methodological falsificationism, has done the reputation of econometrics much harm. This claim is elaborated in the chapters which follow the discussion of the various probability theories. The transition from probability theory to econometrics is shaky, as chapters 6 and 7 demonstrate. Chapter 8, which presents a case study in one of the best episodes of applied econometric inference, shows that the sampling and testing metaphors which dominated econometrics can lead to serious self-deceit. Chapters 9 and 10 bring various arguments together and recommend the positivist tradition, in which econometrics was born and to which it should be brought back again.

Finally, what about truth? Does econometrics, based on the right kind of probability, yield ‘true knowledge’? Not so. The quest for truth, which dominates much of contemporary econometrics, should be abandoned. If econometricians are able to deliver useful approximations to empirical data, they achieve a major accomplishment. What defines ‘useful’ is an intricate matter, which can only be clarified on a case-by-case basis. A model which is good for one purpose, may be inappropriate for another.

I hope that the reader will allow the author a few disclaimers. First, the focus on econometrics does not mean that there are no other ways of doing empirical economics, neither is it intended to suggest that purely theoretical work is not interesting. This book intends to provide a com-

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plement to books on economic methodology which tend to ignore the strengths but also weaknesses of econometric inference.

Secondly, even though the book focuses on econometrics, I neglected some approaches that might warrant discussion. For example, there is hardly discussion of non-parametric inference, bootstraps, or even many specific cross-section topics. Many of the fundamental themes discussed here apply equally to econometric approaches which are beyond the scope of this book.

Thirdly, I have assumed that the readers of this book will be econometricians who are interested in the philosophical and statistical roots of their activities, and economic methodologists who have an interest in the scope and limits of empirical econometrics. This brings the risk that econometricians may find the econometric discussions not always satisfactory, while methodologists might complain that I have not done justice to all philosophical theories and subtleties that they can think of. I hope that both types of readers are willing to search for added value rather than concentrate on what they already know.

After the disclaimers finally some words of thanks. The book grew out of a PhD thesis, which was defended at the CentER for Economic Research of Tilburg University (The Netherlands). I also was able to discuss various parts with colleagues during visits to the London School of Economics, Duke University, the Eidgenössische Technische Hochschule Zürich, the University of Western Australia and at many seminars and conferences. For their financial support, I would like to thank in particular the Foreign and Commonwealth Office, the Fulbright Commission and NWO (Netherlands Organisation for Scientific Research).

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