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Editors' introduction The significance of testing in econometrics

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In December 1991 a three-day workshop was held at Tilburg University on some fundamental issues in econometrics under the title *The Significance of Testing in Econometrics*. The workshop was supported by SPES as one of a series of European workshops: *Applications of Recent Developments in Econometrics and Economic Theory*. This series of workshops had been organized jointly by the European University Institute in Florence, the CEPR in London, and CentER in Tilburg. CentER provided additional financial and other support for the December 1991 workshop.

The idea behind the workshop was to ask again a number of basic questions in econometrics, such as:

- What is the purpose and what are the intended consequences of testing?
- Can econometrics decide the correctness or falsity of an economic theory? If not, are there alternatives?
- Does there exist growth of knowledge in economics? If so, what is the role of econometrics in this growth?

There are different angles from which these questions can be viewed: historical, philosophical, empirical, and theoretical. At the workshop participants representing all these angles (and more) were present. In total seventeen papers were presented and discussed, organized in five sessions over two and a half days. The five sessions were: statistics, philosophy, applied econometrics, econometric methodology, and history of testing. The eleven papers in this issue

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emerged from the papers presented at the workshop. All papers were thoroughly refereed and revised for this issue.

The first paper, by *Keuzenkamp and Magnus*, discusses different aims of testing: theory testing, validity testing, simplification, and decision making. In particular the approaches of Fisher and Neyman–Pearson are considered. The meaning of statistical significance is discussed and significance tests in this Journal are evaluated.

Mirowski compares practices across physics, psychology, and economics using narratives from recent philosophy of science and the technique of Birge ratios.

Cartwright addresses the question: What kind of information is the econometric model supposed to represent? She focuses her attention on two answers: the econometric model summarizes information about a probability distribution, and, more difficult, the model – in addition – makes claims about causal relations.

Pesaran and Smith discuss the way in which theory is used in applied econometrics. In particular, they compare the traditional strategy of testing restrictions implied by the theory with newer theories that do not allow closed-form solutions.

Kim, De Marchi, and Morgan view testing as a comparison of specific characteristics of economic theories with the observations. They conclude that there is no inference possible from the outcome of a test to the validity of the theory as a whole.

Keuzenkamp and Barten illustrate the interplay between economic theory and empirical economics with a survey from consumer demand econometrics, in particular concerning the validity of the homogeneity condition. They argue that tests of this condition should not be understood as tests of demand theory, but rather as specification tests.

Boumans' paper emphasizes the importance of the mathematical form of a model by comparing business-cycle theories in differential form with those in difference equation form. This distinction was used by Frisch to criticize Tinbergen's analysis of business cycle theories based on the difference equation approach.

McAleer surveys more than one hundred empirical papers in which models have been tested against one or more non-nested alternatives. He finds, inter alia, an alarming lack of diagnostic tests in many papers and in many cases, the size of tests used is unknown. The confidence in the resulting inferences can at best be limited.

Granger, King, and White argue that it is often better to use model selection criteria rather than formal hypothesis testing when evaluating alternative models.

Spanos confronts the textbook econometric approach, based on Fisher and Gauss, with the biometric tradition of Galton, Pearson, and Yule, and argues that the latter is better suited to nonexperimental data.

Härdle and Kirman fit price–quantity relations by means of nonparametric estimation techniques. They show that testing aggregate data for properties derived from the theory of individual behaviour is inappropriate.

We are grateful to the *Annals of Econometrics* for providing us with the opportunity to publish the proceedings of our workshop and to all authors and referees for their support and their punctuality.