# Editor's Introduction

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During my education at MIT and Stanford in the 70's, the methodological principles I learned were based on logical positivism. Methodological training in graduate programs in economics has not changed much since then. This is surprising, since logical positivism collapsed as a philosophy of science in the 1950's. Unfortunately, the foundations of economics and econometrics continue to rely on this obsolete philosophy. The hard work and thought required to build a sound methodology going beyond positivism, has not been done. Radical changes in both economics and econometrics would result from the complete overhaul required to do this job. We must remember that econometrics is a young discipline, and Kuhn's work shows that scientific progress depends on revolutions. I will point out some directions which I think are important, and encourage researchers to work on these areas. Some more ideas are given in my paper on causality, coming in the next volume.

One of the key ideas of logical positivism is that all real knowledge comes from facts and logic. The subjective ingredients of opinions, value judgments, intuitions, etc. play no role in scientific knowledge. In econometrics, this suggests that the data, plus correct theory, will determine the truth. I was taught to believe that we can find out which of several competing theories are true by the use of econometric methods. When I tried to do this – for example, to find out which theory of consumption function is right – I found that it does not work like this. Data CAN rule out certain theories, but is unable to decide among several others.

This fundamental problem – call it "under-determination" – has been rediscovered in many different areas of scientific inquiry. Even when we have all possible facts at our disposal, there will always be a large number of theories which are compatible with the facts: theories are not completely determined by observations. This is almost immediately obvious in the econometrics context, since we can fit any number of models to a finite collection of data. Thus choice of a model is ALWAYS based on facts + some subjective elements. A positivist mindset has led us to ignore the subjective elements of model choice, which are crucial to the selection of the final model. Systematic approaches to this subjective ingredient are available in Bayesian econometrics, and also in Hendry's methodology, but neither of these is sufficient. There are many, many arbitrary ingredients in model choice which are not subject to analysis.

Contrary to positivist ideas, choosing among models inevitably involves a subjective element. Because this is not widely recognized, the final model selected depends on many arbitrary choices made by the econometrician. This leads to an extremely diverse set of models, and conflicting conclusions about any possible issue which has been the subject of an econometric study. The only way to remedy this is to take this subjective element in model choice explicitly into account. Subject matter knowledge provides valid additional input into this model choice, and must be taken into account in any serious econometric investigation. This

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means that econometrician must learn about the real world issues which are under investigation via the regression models he/she is estimating. This real world knowledge is an essential guide to choosing among competing models, which cannot be done purely on the basis of data.

This recommendation for the econometrician to learn about and utilize real world knowledge in model selection is contrary to the idea of "specialization" which suggests that we should confine ourselves to the statistical analysis. My personal experience, and also that of several others (including Freedman, see vol 1 of this journal) who have ventured in this direction, is that this is extremely fruitful and enlightening. Thus I strongly encourage all researchers to transgress discipline boundaries and go beyond the purely statistical analysis to a serious investigation of the real world issues which regression models purport to address.