

1 Developments and New Dimensions in Econometrics

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Summary. This book presents 14 papers with surveys on the development and new topics in econometrics. The articles aim to demonstrate how German econometricians see the discipline from their specific view. They briefly describe the main strands and emphasize some recent methods.

1.1 Introduction

75 years ago on the 30th of December in 1930 the Econometric Society was founded and two years later the Society has decided to establish its own journal 'Econometrica'. This was the birth of econometrics, but the roots lie in the mathematical and statistical economics of the nineteenth century. The 1930s were determined by the enthusiasm of an international group of young people. National style and theoretical allegiance seemed to matter less than their common methodological programme. Ragnar Frisch (1970, p. 152), the first editor of *Econometrica*, describes this feeling when he talks about the First European Meeting of the Econometric Society in 1931 in Lausanne: 'We, the Lausanne people, were indeed so enthusiastic all of us about the new venture, and so eager to give and take, that we had hardly time to eat when we sat together at lunch or at dinner with all our notes floating around on the table to the despair of the waiters'. The first years can definitely be characterized by mathematical models and methods to describe macroeconomic problems and a lack of suitable data sets. Since this time we have observed a rapid and sustainable development. Was it a success story or a chain of frustrations? Both is true.

On the one hand the enthusiasm has vanished, the belief that large econometric models can completely explain the economic development has given way to a more skeptical view. The strategy of the Cowles Commission was criticized and alterna-

tive approaches were presented as 'general to specific modelling' by Hendry (1980), 'sensitivity analysis' by Leamer (1985) or 'reduced form vector autoregressive models' by Sims (1980). Forecasts are not always satisfactory. Many researchers believe that it is not really possible to estimate structural models. Summers (1991), for example, is convinced that applied econometrics is ineffective, not more than explorative data analysis can be done by econometrics. Nevertheless, many econometricians still have the objective to estimate structural models. Some of the following contributions demonstrate the progress in this field, especially the first and the fifth paper.

On the other hand the data situation has significantly improved. Not only are aggregated yearly time series available, but quarterly, monthly, weekly and even daily or tick-by-tick data can be used. Furthermore, large cross-sectional, panel, duration and multilevel data are the basis of many applied econometric studies. Computers give us the chance to process such large information. This was and is a good motivation to develop estimation methods and testing procedures for these specific data constellations.

In particular progress in time series analysis has been made, since this field is considered in the perspective of econometric regression models. Nowadays, unit roots and co-integration investigations are standard in single equations models and vector autoregressive models. This means non-stationary in contrast to traditional time series are feasible; the bridge is made between economic theory of equilibria and the econometricians, whose models concentrated on the short-run dynamics, and poor performance of simultaneous macroeconomic models has improved. Recent developments tackle the problem for structural multivariate models, but seasonal models are also considered and structural shifts are in discussion. Econometricians also try to benefit from traditional multivariate statistical methods, like factor analysis and combine these with modern time series methods.

While in the 1930's and over a period of 40 years macroeconomic models with many equations have dominated our discipline, in the 1970's the situation changed. The beginning of this new phase is characterized by the new interest in microeconomic questions and the availability of large cross-sectional data sets, but in applied econometrics the old methods were still used. A little later a revolution of new approaches started in many fields and is still continuing. First, the range of estimation methods extends enormously. Besides the traditional least squares, maximum likelihood methods and methods of moments we find several further methods in the literature: instrumental variable methods, generalized methods of moments, quasi maximum likelihood, quantile estimators, extremum estimator, generalized estimating equations, simulation based estimators. Non- and semi-parametric procedures are developed. Second, researchers pay more attention to testing. Especially the spectrum of specifications tests is extended. Incorrect omission of regressors, inclusion of other variables that are proxies for the omitted variables and a false functional form of the econometric relationship are leading sources of biased estimations. Third, nonlinear approaches become more relevant. Specific microeconomic data lead to binary, multinomial and ordered probit or logit, count data, duration and tobit models. All of them have a specific nonlinear character and the problem of unobserved heterogeneity has to be solved. Fourth, econometricians analyze specific data problems in more detail. These include measurement errors, anonymization of