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EDITORIAL

Editors' introduction

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Since Walter Krämer has devoted his first scientific focus to the least squares methodology at the beginning and to test for structural breaks in time series at the end of the 1980s he contributed so far 140 scientific papers. Most cited, according to the Web of Science as of June 17, 2013 with 112 citations, was "A New Test for Structural Stability in the Linear-Regression Model" published in the *Journal of Econometrics* in 1989. To mention only one further achievement, he currently is coordinating editor of the *German Economic Review*. Many econometricians and statisticians have had the luck to work with Walter in the meantime and have been influenced by him since then. On his 65th birthday, November 21, 2013, the Department of Statistics at the Technische Universität Dortmund hosted a Workshop celebrating Walter's scientific contributions. In addition to this Workshop, we have taken the opportunity to edit a special issue of the *Statistical Papers* (StatPap), focused on his research areas, to honor and thank him. This special issue contains 12 papers dealing with least squares and structural breaks, and deviations thereof. Some of them have been presented at the Workshop and all have been subject to StatPap's normal refereeing process.

We briefly elaborate on the connection of the papers in this volume to Walter's work.

The unifying theme - with one exception - is longitudinal dependence, a typical, but not exclusively econometrical, data defect which Walter considered intensively for univariate time series. For panel data B. H. Baltagi, C. Kao and S. Na, here in addition, test for cross-sectional dependence, using a wild bootstrap F test in their paper. And

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it will be seen that making use of the increase in computer power and applications to finance are immanent to many contributions of this volume. D. Wied, D. Ziggel and T. Behrens derive new tests for structural changes, however not for level-shifts, but for breaks in the cross-sectional dependence of panel data. Their application allows them to improve the calibration of global minimum-variance portfolios. J. Breitung and R. Kruse also apply structural breaks to finance and derive tests to determine when bubbles burst. The difference between the random walk and the explosive regime is distinguished by modifying the Chow test statistics, in order to maintain asymptotic normality. Whereas Walter's main merit is to identify a structural break, M. Demetrescu and Ch. Hanck already assume breaks, namely in the error variance, and test for a potential further model misspecification of instationarity, characterized by a unit root, again in a panel. In contrast to the linear algebra for the least squares estimation Walter studied, A. Zeileis and T. Hothorn collect a computer-intensive toolbox of permutation tests for structural change based on the likelihood, especially to increase efficiency in small samples. Another contribution to financial econometrics is related to Walter's rather recent topic of distinguishing structural break from long memory. For realized asset correlations, Ph. Bertram, R. Kruse and Ph. Sibbertsen aim at a distinction of fractional integration and level shifts. Whereas Walter's insights where on breaks in the parameter space, T. Lee, M. Loretan and W. Ploberger derive consistent, rate-optimal tests for jumps in the state space for a time-continuous univariate diffusion process, observed at discrete-time points. As well A. Kremer and R. Weißbach consider discrete-time observations of a continuous-time Markov jump process. An absorbing state disables an asymptotic analysis in the typical time series direction of time T and requires, once a again, a panel. Their application is related to credit ratings in which Walter's recent papers reveal interest. As opposed to the least-squares principle the authors resort to the likelihood principle. As does H. Lütkepohl, who studies Bayesian estimation of the impulse responses in vector-auto regression panel data. He finds that giving care to the sign of shocks reduces the widths of confidence bands. That time series panels are not solely data in econometrics is demonstrated by M. Waser, M. Deistler and their coauthors. As a matter of public health, they apply achievement of time series analysis to EEG in the diagnostics of Alzheimer's disease.

To study differences of estimators, derived from the different principles, can be extended to studies on the difference of estimators resulting from ordinary or generalized least squares, being an early topic of Walter. Hooking-up on his question of estimator uniqueness in the linear model, O. M. Baksalary, G. Trenkler and E. Liski extent the scope to a multicolinear model and the estimation of estimable parameters. Together with maximum likelihood and least-squares, the method of moments is a contemporary estimation principle. And as advantages and advances are important to report, also counterexamples and limitations must be documented. For an economic income distribution of the Benini-type, Ch. Kleiber proves moment indeterminacy.

The contributors to this *Statistical Papers* issue, who are Walter Krämer's friends, either being teacher, colleagues, or students, dedicate this volume with gratitude and warm wishes for many more birthdays.

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