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Wai Keung Li · David A. Stanford
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Editors

Advances in Time Series Methods and Applications

The A. Ian McLeod Festschrift



The Fields Institute for Research
in the Mathematical Sciences

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Preface

Time series analysis took off with a burst of activity in the 1970s due to a number of publications employing time domain techniques. No doubt, the pivotal event in this advance can be ascribed to the book by Box and Jenkins which appeared in 1970. The so-called Box and Jenkins's approach for autoregressive integrated moving-average (ARIMA) models was made popular by many researchers who refined and expanded its initial framework.

Among these researchers, A. Ian McLeod stands out as one who has contributed to almost every aspect of the Box–Jenkins framework both in theory and in practice. His method in deriving diagnostic statistics via the asymptotic distribution of ARMA model residuals is versatile and applicable to nearly all kinds of new time series models. His work in long memory time series with Keith Hipel was truly ahead of time. Professor McLeod was one of the early advocates of the uses of inverse and inverse partial autocorrelations. The McLeod–Hipel time series package was one of the few available comprehensive computer softwares for time series analysis in the 1970s and 1980s.

Ian McLeod's research interests cover also random number generation and environmental statistics, especially on water resources issues. His many influential contributions are summarized by a review article in this monograph.

Since the 1980s time series analysis has grown in many different directions. The new areas that have appeared include, among other topics, nonstationary time series, nonlinear models and conditional heteroscedasticity models. Despite the range of these new developments, the papers in this volume testify to the impact that Ian McLeod's influence is still being felt widely.

This volume arises as a consequence of a Festschrift in Ian McLeod's honour held at the University of Western Ontario June 2–3, 2014 that was partially supported by the Fields Institute. Participants of the Festschrift were invited to submit works to form this volume. The resulting peer-reviewed monograph consists of 13 technical papers and one review on Ian McLeod's work. The papers reflect the diversity of time domain time series analysis since its infancy in the 1970s. The topics covered include diagnostic checks for duration time series models, partially nonstationary vector time series, methodology for ordered categorical data, a new

$C(\alpha)$ test for estimating equations, model testing using wavelets, an adaptive Lasso approach to vector autoregressions, identification of threshold nonlinear models, graphical methods, as well as business and environmental applications. We believe that the papers in this volume shed light on a variety of areas in time series analysis, and are hopeful that it will be useful to both theorists and practitioners.

The editors would like to take this opportunity to thank the Fields Institute, the University of Western Ontario and the University of Hong Kong, and the participants of the Festschrift in 2014 for their support. Thanks are also due to the authors and referees for papers of this volume for their effort and hard work.

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