Book review

Econometrics with applications in R [*Econometrie cu aplicații în R*], IVth edition *by* Dănuț-Vasile JEMNA. Iași: Publishing House of the „Alexandru Ioan Cuza" University of Iași, 2017. ISBN 978-606-714-384-3.

Appreciated by the author as one of the greatest inventions of the 20th century, econometrics proves to be indispensable in understanding the current economic and social phenomena. A main challenge in the field of econometrics that is brought to attention, and that is also specific to other scientific fields, is the need to continuously improve the research methods, particularly because the sources of information and the available data are constantly increasing.

According to the author, an expert in econometrics can no longer claim the full coverage of open research directions in this field; consequently, econometric work can be classified according to the level and the direction of research, the present book falling into the basic econometrics category, as a guide for Romanian speaking practitioners, students and academics.

Numerous academic books that deal with the subject of econometrics and with the R program have been published in the last years by prestigious publishing houses, such as Elsevier (Vinod, 2019; Tsionas, 2019; Kelejian & Piras, 2017), Routledge (Sul, 2019), Wiley (Croissant & Millo, 2019), Cambridge University Press (Franses, 2018; Martin, Hurn, Harris, 2013), Oxford University Press (Racine, 2019), and many others. In Romania, with the exception of research articles, only few such extensive works have been carried out since 2010 (Chilarescu et al., 2014; Jemna, 2012; Săvoiu, 2010). Besides that, a limited number of course handbooks are provided on the universities' websites, but all of them lacking applications in R programming language. In the context of a scarce number of published papers and books on this subject by Romanian researchers, it is reasonable to consider this modern book as one of the reference works in the Romanian field of econometrics.

The present book is the result of a long teaching and research activity of the author, and, in addition to previous editions, this volume has updates and additions to the chapters. Moreover, for the examples and exercises provided in each chapter the author uses R programming. A strength of this new edition is that a large part of the statistical data used reflects current socio-economic issues (covering Romania, the European Union or countries from over the world) in order to facilitate the understanding and accumulation of knowledge, by reference to reality.

The book is written in a specialized language, but it is at the same time clear and it facilitates the understanding of the content it presents. It has a classical structure, with nine chapters, each of them ending with a subchapter dedicated to tests and exercises. The first chapter provides examples that illustrate a series of

applications of the econometrics, and it contains as well theoretical and methodological elements of econometrics, such as definitions, theoretical and methodological issues and the fundamental concept of the econometric model. The last subchapter of the first chapter is dedicated to an introduction into the R program. In the second chapter elements of probability theory and mathematical statistics are presented, such as the concepts of probability, variables, parameters, and probabilistic repartitions used in econometrics (Bernoulli, Poisson, Chi-square, Student, Snedecor-Fisher).

The next chapters continue to explore the fundamentals of econometrics in a logical succession: the third, fourth and fifth chapters are dedicated to econometric modelling with numerical variables (simple linear regression, multiple linear regression, non-linear regressions), while the sixth chapter presents regression models with alternative variables (ANOVA, ANCOVA, Logit, Probit). These chapters, organized from simple content to more complex, contain econometric models illustrated by numerous examples, case studies (like the correlation between the population with higher education and the GDP at the level of the Romanian counties, or demographic indicators in Latin America), tests and exercises. The seventh chapter presents the hypothesis of the regression model (hypothesis to the errors and to the independent variables), a very important aspect in econometric models, for providing a high quality of the regression model parameters.

The eighth chapter contains elements regarding time series modelling (a distinct econometric discipline), structured in two sub-chapters: time series as stochastic processes, and their modelling with the stochastic processes (MA, AR, ARMA, ARIMA, Box-Jenkins). The last chapter, the ninth, presents a series of aspects related to the dynamic econometric models. Its utility comes from the fact that it approaches the dynamics causality that influence the dependency between the variables.

The book ends with a bibliography and with numerous annexes that contain probabilistic tables used for teaching and research (Laplace function, Student repartition, Chi-square distribution, Fisher distribution, Durbin-Watson distribution).

In conclusion, this book is more than welcome, being useful for Romanian speaking economists and geographers, as well as for students and for all those who want to acquire or deepen their knowledge in this discipline.

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