CONFERENCE PROCEEDINGS
FULL TEXT PAPERS

edited by

Albert Gardoń, Cyprian Kozyra and Edyta Mazurek

20th AMSE

APPLICATIONS OF MATHEMATICS AND STATISTICS IN ECONOMICS

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Foreword

The jubilee twentieth International Conference "Applications of Mathematics and Statistics in Economics" (AMSE 2017) was held in Szklarska Poręba, Poland, from 30th August to 3rd September 2017. The beginning of this conference series dates back to 1998. The first conference was organized by Prof. Miroslav Abraham from Matej Bel University in Slovakian village Liptovský Trnovec, in 3rd – 4th September 1998, with 23 papers presented by the staff of the Faculty of Ecomics of Matej Bel University in Banská Bystrica (Slovakia) and the Faculty of Informatics and Statistics of University of Economics in Prague in (Czech Republic). In 1999 a team of statisticians from Wroclaw University of Economics (Poland) was invited by Czech colleagues to participate in the second conference. Since 2001, the conference has been organized periodically by the three centers mentioned above, but with active participation of scientists from other universities and other countries as well.

The topic of the 20th AMSE conference was very similar to the previous nineteen conferences: it was devoted to varied current problems of the applications of quantitative methods in economics. Since 2014, the papers presented on AMSE conferences have been included in the Conference Proceedings Citation Index of the Web of Science database and they are thematically divided into five sections:

- Macroeconomics, Public Economics and Methodological Issues of Economics
- Social Economics, Economic Sustainability and Demographic Economics
- Financial Markets, Risk Measurement and Insurance
- Microeconomic Issues
- Multidimensional Statistics in Economics.

The number of positively reviewed contributions published in the conference proceedings is equal to 40 and they have been prepared not only by authors from the three co-organizing universities, but also from other universities. Every paper has been reviewed by two reviewers, each from a different country, the author's country excluded. Full text papers are available not only in conference proceedings published in the form of a compact disc, but they are also freely available on the conference website at http://amse.ue.wroc.pl/proceedings2017.html.

During the 20th AMSE conference some jubilee events were organized by the Organizing Committee under leadership of Dr. Beata Zmyślona. The special session devoted to the history of AMSE conferences was led by Prof. Walenty Ostasiewicz, chairman of Scientific Committee. The documentary film (available at http://amse.ue.wroc.pl/) prepared by team: Dr. Cyprian Kozyra, Dr. Beata Zmyślona and Prof. Joanna Dębicka (director), presented facts, photos, important persons and number of contributions prepared during twenty conferences by authors from different countries. Four persons participating in all 20 conferences were honored with the jubilee certificates: Prof. Richard Hindls and Prof. Stanislava Hronová (both from University of Economics, Prague), Prof. Rudolf Zimka and Ing. Peter Laco, PhD. (both from Matej Bel University, Banská Bystrica). The history of AMSE conferences organization by three universities could be summarized in the following table:

Matej Bel University, Banská Bystrica	University of Economics, Prague	Wrocław University of Economics
3rd – 4th September 1998, Liptovský Trnovec		
2nd – 3rd September 1999, Liptovský Trnovec		
31st August – 1st September 2000, Poprad	13th – 14th September 2001, Zadov	4th – 7th September 2002, Kudowa Zdrój
4th – 5th September 2003, Banská Bystrica	3rd – 4th September, 2004, České Budějovice	1st – 2nd September 2005, Wrocław
29th August – 1st September 2007, Poprad	31st August – 1st September 2006, Trutnov	27th – 29th August 2008, Wisła
25th – 29th August, 2010, Demänovská Dolina	27th – 28th August 2009, Uherské Hradiště	31st August – 3rd September 2011, Lądek Zdrój
28th August – 1st September 2013, Gerlachov	30th – 31st August 2012, Liberec	27th – 31st August 2014, Jerzmanowice
31st August – 4th September 2016, Banská Štiavnica	2nd – 6th September 2015, Jindřichův Hradec	30th August – 3rd September 2017, Szklarska Poręba

The conference was as usually a good opportunity not only to exchange opinions of scientists and specialists, but also to strengthen the friendship between the all participants, mainly representing three nations co-organizing this conference series. Moreover, the location of the conference makes it possible to search for some common cultural roots of Central European countries in addition to a common scientific ground. Despite rainy weather, which changed plans about trips, conference participants visited after scientific sessions: the crystal glass factory "Julia" in Piechowice, Szklarka Waterfall, railway trip and Jizera Mountains around Jakuszyce.

Finally, presenting this conference proceedings as a scientific fruit of AMSE 2017 conference, we would like to thank all the authors for their contributions and all the reviewers for many useful suggestions that have improved the quality of the papers. We should also like to thank members of Scientific Committee for their help in peer review process, and also Mr. Grzegorz Rogoziński and Ms. Beata Dębska for his work on graphic design of conference proceedings and website. We hope that next conferences, starting from announced by Czech colleagues AMSE 2018 in Kutná Hora, will be so fruitful as previous twenty.

Albert Gardoń
Cyprian Kozyra
Edyta Mazurek