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**Article**

## 39th Conference Multivariate Statistical Analysis MSA 2021: Conference review

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## 39th Conference Multivariate Statistical Analysis MSA 2021. Conference Review

Marta Małecka<sup>1</sup>, Artur Mikulec<sup>2</sup>

The 39th international scientific conference Multivariate Statistical Analysis MSA 2021 was held on November 8–10, 2021 in Łódź, at the Faculty of Economics and Sociology of the University of Łódź (3/5 P.O.W. Street). The conference was organized by the Department of Statistical Methods of the University of Łódź and its co-organizers: the Institute of Statistics and Demography of the University of Łódź, the Committee of Statistics and Econometrics of the Polish Academy of Sciences and the Polish Statistical Association, branch in Łódź. The honorary patronage over the conference was taken by Elżbieta Żądzińska – Rector of the University of Łódź and Dominik Rozkrut – President of Statistics Poland.

The conference was organized in cooperation with the MASEP conference (Measurement and Assessment of Social and Economic Phenomena), organized by the Department of Economic and Social Statistics of the University of Łódź. The conference received financial support from the Minister of Education and Science (MEiN) as part of the "Excellent Science" program (DNK/SP/515427/2021). Educational activities related to the conference were supported by the National Bank of Poland as part of an educational project (NBP-DEW-WPE-AB-0662-0226-2021), which corresponds to NBP's priority areas of economic education – "New horizons of economic thought". The company StatSoft Polska Sp. z o.o. was also the content partner of the conference. Prof. Czesław Domański was the chairman of the Scientific Committee and Alina Jędrzejczak, Assoc. Prof. of the University of Łódź was the chairman of the Organizing Committee. The scientific secretaries of the conference included Marta Małecka, Asst. Prof. of the University of Łódź, Artur Mikulec, Asst. Prof. of the University of Łódź and Aleksandra Baszczyńska, Assoc. Prof. of the University of Łódź.

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The main goal of the MSA 2021 conference was to organize an international forum for discussion and exchange of ideas and views on the development of statistics as a science. The specific objectives were:

- presentation of the latest achievements in the field of multidimensional statistical analysis,
- disseminating knowledge in the field of data analysis and the application of statistical methods in other scientific disciplines, especially in economics, sociology and finance, exchange of experiences,
- creating a bridge between science (statistics) and research practice (individual users, business and administration).

The MSA 2021 conference was held in the hybrid formula: in-person and online. 84 people (62 in-person and 22 online) from various academic centres in Poland participated in the conference, including representatives from: Gdańsk, Katowice, Kraków, Lublin, Łódź, Poznań, Radom, Szczecin, Warsaw and Wrocław, representatives of Statistics Poland and the Statistical Office in Łódź. The conference hosted also representatives of academic society from abroad: Czech Republic, India, Iran and Italy. During the conference 15 sessions (plenary and parallel) were held, with 63 papers presented (41 stationary and 22 on-line).

The conference was opened by the Chairperson of the Organizing Committee, Alina Jędrzejczak. On behalf of Elżbieta Żądzińska – Rector of the University of Łódź – the conference participants were welcomed by Agnieszka Kurczewska, Vice-Rector for External Relations. Then the short welcome speeches were given by Ewa Kusideł, Vice-Dean for Science (Faculty of Economics and Sociology, UŁ) and the Chairman of the Scientific Committee – Czesław Domański (University of Łódź).

According to the tradition of the MSA conference, the first plenary session (PLENARY I, November 8<sup>th</sup>) was devoted to prominent representatives of the historical statistical thought and to the memories of recently deceased statisticians. This session was chaired by Bronisław Ceranka (Poznań University of Life Sciences). The first lecture devoted to the life and scientific work of Antoni Łomnicki (1881–1941) – a probabilist and statistician – was given by Mirosław Krzyśko (Adam Mickiewicz University in Poznań). The next speaker was Czesław Domański (University of Łódź), who presented the memories of Józef Kleczyński (1841–1900) – a precursor of population estimation between censuses – and the memories of Kazimierz Władysław Kumaniecki (1880–1941) – the initiator of the Polish Statistical Society and of the first Statistical Yearbook – Polish Statistics. In this session, the profiles of three famous Polish statisticians who passed away last year were recalled:

- "Dominik Szynal – creator of the probabilistic environment in Lublin" – Mariusz Bieniek (Maria Curie-Skłodowska University),

- "Daniel Kosiorowski – an outstanding Krakow statistician" – Józef Pociecha (University of Economics in Krakow),
- "Ryszard Walkowiak – statistician and naturalist" – Małgorzata Graczyk (University of Life Sciences in Poznań).

During the conference, there were four open lectures given by invited speakers. Two of them were presented during the plenary session on the first day of the conference (PLENARY II, November 8<sup>th</sup>). This session was chaired by Czesław Domański (University of Łódź). The invited lectures included:

- "Harnessing the power of Earth Observation for Official Statistics" – Dominik Rozkrut (Statistics Poland),
- "About the sampling plans depending on the position statistics of the auxiliary variable" – Janusz Wywiół (University of Economics in Katowice).

The other two invited lectures were given at the closing session on the last day of the conference (PLENARY II, November 10<sup>th</sup>). This session was chaired by Alina Jędrzejczak (University of Łódź). The topics of these lectures were as follows:

- "The Appearance of the Rawlsian Paradox when Neglecting Income Dependence of the Random Equivalence Scales" – Stanisław Maciej Kot (Gdańsk University of Technology),
- "Graphical and Computational Tools to Guide Parameter Choice for Robust Clusterwise Regression" – Francesca Greselin (University of Milan).

Parallel sessions of the conference covered a broad area of topics related to the theory and applications of mathematical statistics. The scope of the topics included in particular the following groups of issues:

1. Theory of statistical methods. The papers presented at the conference covered both the topics related to the estimation and statistical inference. There were papers from the area of taxonomic issues. Topics related to dealing with outliers, fuzzy numbers, Big Data, bootstrapping techniques and text recognition were also discussed.
2. Macroeconomic applications. In this thematic group, there were issues related to macroeconomic interventions, inflation and the use of modern data collection methods such as scanner data on web-scraped data.
3. Demographic and social issues. An extensive group of papers concerned issues related to the labour market. There were debates relating to many social issues such as people with disabilities or elderly people, retirement benefits and the quantification of poverty. In the area of demography, topics such as birth dynamics and demography of cities were discussed. A number of papers dealt with social issues related to the COVID-19 pandemic.

4. Sustainable development. Among the social topics, a special place was taken by discussions related to sustainable development, in particular: the impact of economic activity on the environment, air quality, water demand depending on weather conditions or the transformation of cities.
5. Business applications. In the field of business applications, the conference discussions covered the following areas: energy consumption forecasts, logistics, duration of business entities, micro-enterprise statistics, investment attractiveness of voivodships, industrial transformation, identification of bid rigging, organizational security culture.
6. Financial market. The use of statistical methods in financial market analysis was a separate group of topics within statistical applications. Presented papers dealt with issues such as: the relationship between the COVID-19 pandemic and exchange rates, the cryptocurrency market, banking scoring models, financial efficiency of insurance companies and modelling of systemic risk in the insurance sector.

The parallel sessions were chaired by:

#### **November 8<sup>th</sup>**

SESSION IIIA	Jerzy Korzeniewski (University of Łódź)
SESSION IIIB	Sławomir Śmiech (Cracow University of Economics)
SESSION IVA	Andrzej Sokołowski (Cracow University of Economics)
SESSION IVB	Małgorzata Graczyk (Poznań University of Life Sciences)

#### **November 9<sup>th</sup>**

SESSION IA	Jacek Białek (University of Łódź)
SESSION IB	Maria Grzelak (University of Łódź)
SESSION IIA	Sławomir Bukowski (Kazimierz Pulaski University of Technology and Humanities in Radom)
SESSION IIB	Wojciech Zieliński (Warsaw University of Life Sciences)
SESSION IIIA	Beata Bieszk-Stolorz (University of Szczecin)
SESSION IIIB	Mirosław Krzyśko (Adam Mickiewicz University, Poznań)

#### **November 10<sup>th</sup>**

SESSION IA	Grażyna Trzpiot (University of Economics in Katowice)
SESSION IB	Stanisław Maciej Kot (Gdańsk University of Technology)

A detailed list of presenting authors and topics is available at:  
<https://sites.google.com/view/msa2021pl/archiwum/msa-2021>.

The debates were summed up and the conference was closed by the Chairman of the Scientific Committee, Prof. Czesław Domański. He thanked all participants for their active participation in this year's edition of the conference. He also gave thanks to the co-organizers and partners, and all institutions cooperating in the organization of the conference. The chairman announced that the Multivariate Statistical Analysis MSA 2022 conference will be held at the Training and Conference Center of the University of Łódź in Łódź on November 7–9, 2022.