

# 27<sup>th</sup> International Conference *Applications of Mathematics and Statistics in Economics (AMSE 2025)*

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The 27<sup>th</sup> annual international conference, entitled Applications of Mathematics and Statistics in Economics, was held from 27 to 31 August 2025 in Hradec Králové. The organisation of this year's conference was undertaken by the Departments of Statistics at the Prague University of Economics and Business. The conference was held under the auspices of the President of the Czech Statistical Office, while *Statistika: Statistics and Economy Journal* acted as a conference partner. The conference was attended by over 40 experts from the Czechia, Slovakia, and Poland, including representatives from Matej Bel University in Banská Bystrica, Prague University of Economics and Business, Wrocław University of Economics and Business, University of Pardubice, Czech University of Life Sciences, Slovak Statistical and Demographic Society, the Czech Statistical Office, and the Statistical Office of the Slovak Republic. *Statistika: Statistics and Economy Journal* had a stall at the conference, where conference participants had the opportunity to discuss the conditions and possibilities of prospective publication in the journal with representatives of the editorial board.

The professional programme of the conference was opened by Marek Rojíček, President of the Czech Statistical Office, with a keynote speech entitled *The Future of Demographic Statistics in the Czech Republic*. In this speech, he outlined further possibilities for the development of demographic statistics in connection with the concept of the census. The traditional approach to demographic statistics was based on data from regular censuses, combined with information on the number of births, deaths, marriages, and migrants. In recent decades, only a small number of countries (primarily in Northern Europe) have been able to estimate the size and structure of their populations using administrative sources alone. However, during the previous census cycle, the majority of countries managed to collect data either entirely or at least partially from administrative sources, without the need to conduct this extensive and costly survey. With regard to the situation in the Czechia, the current scope of administrative data sources remains a limiting factor, although it is anticipated that this situation will gradually improve in the coming years. The analysis of so-called “signs of life” will play a key role in this process. The Czech Statistical Office has made notable progress in this area, implementing both legislative and technical measures as part of the 2021 Census.

The conference then proceeded in four sections: *Macroeconomic Issues, Time Series, Cluster Analysis, Social Economics and Statistics, Statistical Methods and History of Statistics*. A new panel discussion

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on the topic of *Teaching Statistics to Non-Statisticians* was added to the conference programme, with representatives from five universities participating as panellists (Ivana Malá from the Prague University of Economics and Business, Tomáš Hlavsa from the Czech University of Life Sciences, Alena Kaščáková from Matej Bel University, David Zapletal from the University of Pardubice, and Albert Gardoň from Wrocław University of Economics and Business), who presented the programmes and methods of teaching statistics to non-statisticians at their universities. The panel featured an engaging discussion that focused particularly on the depth of theoretical teaching, the benefits and importance of addressing practical problems, the integration of various statistical applications into teaching, and, finally, methods for assessing students' knowledge.

From the conference programme, I would like to highlight a selection of contributions that I consider to be of particularly high quality, intellectually engaging, and methodologically innovative.

In the *Macroeconomic Issues* section, the most notable contribution was *The Impact of Media on Inflation Expectations in V4 Countries*. The authors (Peter Laco, Žaneta Lacová and Timotej Šagúl) presented the results of the research team's work, which examined how different types of news influence inflation expectations across various demographic groups in the V4 countries. The study was based on the assumption that traditional media primarily shape the outlook of older cohorts, while online social networks are more in line with the expectations of younger and more educated individuals. It further posits that media-induced effects can persist for more than a year, highlighting the importance of historical inflation trends and the gradual absorption of new economic information. Granger causality tests were used in the analysis.

The conference paper of Karolína Bakuncová and Luboš Marek on the topic of *Dimensionality Reduction Methods for Clustering Using Signal Analysis* in the *Time Series and Cluster Analysis* section attracted a well-deserved attention of the conference participants. The authors presented the possibilities of improving clustering efficiency through dimensionality reduction using signal processing techniques, namely the Discrete Fourier Transform (DFT), Discrete Wavelet Transform (DWT), and Discrete Cosine Transform (DCT). DFT serves as a fundamental building block for many other signal analysis methods, while DWT and DCT are improvements over DFT both in flexibility and computational efficiency. For the clustering itself, hierarchical clustering with complete linkage was employed. The proposed approach was tested on three datasets of varying sizes from the UCR Archive. Results showed that signal-based representations significantly reduce computation time and, in most cases, provide comparable or even improved clustering results compared to clustering on the original data.

The issue of population ageing was addressed in the *Social Economics and Statistics* section through a contribution titled *Europe's Silver Well-being Map: Where Does Old Age Taste the Sweetest?*, authored by Joanna Debicka, Ahata Girul and Edyta Mazurek. The authors emphasised that, in the context of the ever-increasing proportion of senior citizens, quality of life in old age is no longer merely a personal matter – it is becoming a measure of social maturity, institutional efficiency and the ability of society to respond to the needs of its most experienced members. The authors presented the results of a comparative analysis of the living conditions of older adults across the European Union. Data from the EU-SILC survey and various well-being indicators assess which countries offer the most favourable environments for older people in terms of material wealth, health, social inclusion, subjective well-being and institutional support. Particular attention was paid to public policy practices that contribute to high well-being of seniors. The analysis pointed to countries that act as role models in the field of ageing policies – Belgium, the Netherlands, Finland, Sweden, Ireland and – somewhat unexpectedly – Poland, suggesting the effectiveness of selected local and national initiatives. The findings show that it is possible to build age-friendly societies, where aging does not mean marginalisation, but rather an integrated and valuable part of sustainable social development.

The potential applications of web scraping in the context of data collection on rental prices from Czech real estate portals were explored in the section dedicated to *Statistical Methods* in a paper entitled *Imputation and Weighting of Observations Based on Spatial Dependence in Constructing a Point Estimate of Prices of Rents in Cadastral Areas of Prague*, authored by Adam Slaviček. A spatial dependency analysis was performed on the obtained data, on the basis of which a data imputation algorithm was designed for calculating the price level in cadastral areas with a low number of observations from neighbouring cadastral areas. The imputed observations are assigned weights based on their distance from the centroid of the area, in order to maintain the consistency of spatial relationships. The procedure thus contributes to the methodological framework for analysing the real estate market using spatial data and machine learning.

It has been a long-standing tradition at the AMSE conference that the final presentation is dedicated to the history of statistics. On this occasion, the authors, Prokop Závodský and Ondřej Šimpach, addressed the subject of *250 Years of Teaching Statistics at the University of Prague*. The authors focused on Josef Mader, professor of statistics in the years 1779–1815, author of the theoretically focused publication “Ueber Begriff und Lehrart der Statistik” (1793) and a number of contributions in the proceedings published by the Masonic group around J. A. Riegger (a total of 15 volumes in the years 1787–1795).

The complete AMSE 2025 programme, including abstracts of the presented contributions, can be found at: <<http://www.amse-conference.eu>>. The site also contains information about the history of AMSE and links to previous editions of this international conference.<sup>2</sup>

In accordance with the established tradition of alternating between the three countries (Slovakia – Poland – Czechia), the 28<sup>th</sup> AMSE conference will be hosted by colleagues from the Department of Statistics at Matej Bel University in Banská Bystrica. The event is scheduled to take place in Martin, Slovakia, at the end of August 2026.

<sup>2</sup> In this report on the conference, the texts of the Book of Abstracts were used – accessible via the following link: <[www.amse-conference.eu](http://www.amse-conference.eu)>.