

APPLICATIONS OF  
MATHEMATICS AND STATISTICS  
IN ECONOMICS  
2025

BOOK OF ABSTRACTS





# MÁRIA GRAUSOVÁ, MIROSLAV HUŽVÁR, RUDOLF ZIMKA

Matej Bel University in Banská Bystrica

e-mails: maria.grausova@umb.sk, miroslav.huzvar@umb.sk, rudolf.zimka@umb.sk

---

## NUMERICAL ANALYSIS OF A KALECKIAN MODEL WITH INFLATION-DEFLATION EXPECTATIONS

We investigate a four-dimensional non-linear Kaleckian macroeconomic model built by Murakami and Asada that describes the developments of the rate of utilization, the wage share, the nominal rate of interest, and the expected rate of inflation. In the study of the system's behaviour near equilibrium, we focus on model's parameters that ensure the satisfaction of Liu's criterion and provide potential for Hopf bifurcations. The bifurcation equation of the model allows us to determine the nature of local dynamics with high precision, offering insights into the conditions under which business cycles may arise. These findings are illustrated with numerical simulations, using economically meaningful parameter values to visualize how their changes influence the system's evolution. We analyse in detail the relationship between two model's parameters - the speed of revisions of inflation-deflation expectations, that is considered a bifurcation parameter, and the credibility of the inflation-targeting policy conducted by the monetary authority. The simulations highlight the economic relevance of the analysis.

*Keywords:* business cycle, dynamic Kaleckian model, Hopf bifurcation, inflation-deflation expectations, stability

The research has been supported by the VEGA grant scheme no. 1/0382/23.