Statement Report

on the procedure for awarding the academic position of "Professor"

following a competition in the Field of Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Field 4.5. Mathematics, Scientific Specialty: Operations Research (Financial Mathematics), announced in the *State Gazette*, Issue No. 63 of 10 July 2026, for the needs of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS).

Prepared by Prof. DrSc Julian Revalski, member of the Scientific Jury, pursuant to Order No. 73/23 July 2026 issued by the Director of IMI-BAS.

The sole candidate in the competition is Assoc. Prof. Dr. Tsvetelin Stefanov Zaevski. He was born in 1974. He graduated from the Mathematics High School in Pleven in 1993 and, between 1993 and 1999, studied at the Faculty of Mathematics and Informatics (FMI) of Sofia University "St. Kliment Ohridski", where he obtained a Master's degree in Applied Mathematics.

In 2013, he was awarded the academic and educational degree of Doctor following the defense of his dissertation entitled "Combined Itô and Lévy Processes", under the supervision of Prof. DrSc. Racho Denchev.

Since 2014, he has been employed at IMI-BAS, initially as an Assistant Professor and subsequently as a Chief Assistant Professor until 2021, and since 2021 as an Associate Professor. Between 2020 and 2024, he served as Secretary of the Operations Research and Probability Section (ORPS) at IMI-BAS, and since 2024 he has been its Head. In 2025, he defended his dissertation entitled "A Method for Pricing American-Style Derivatives" and was awarded the degree of Doctor of Sciences.

The candidate has submitted a complete list of his publications, comprising 62 items, as well as a separate list of 16 papers submitted for consideration in the competition for the position of Professor. All 16 papers were published after he had been appointed Associate Professor. Assoc. Prof. Zaevski has declared that none of them were used in the procedure for obtaining his degree of Doctor of Sciences. Seven of these publications have an impact factor and are ranked in categories Q1 or Q2 in Web of Science, while the remaining nine have an SJR indicator and are predominantly ranked in categories Q1 or Q2 in Scopus. Six of the submitted papers are single-authored, while the others are co-authored.

In general, Assoc. Prof. Zaevski's research, as reflected in the publications mentioned above, falls within the field of Operations Research and is specifically concerned with the study of stochastic processes, stochastic optimization problems, and problems in financial mathematics. The 16 papers submitted for the competition present results in the following three areas: the study of modifications of the Kies distribution; chaos in perturbed dynamical systems; and classical problems in financial mathematics, such as risk analysis and management, American-style derivatives, and yield curves.

The first research topic is addressed in five of the papers submitted for the competition (Papers Nos. 1–5). The Kies distribution was introduced in 1958 on the basis of an appropriate fractional linear transformation. The submitted papers investigate modifications of this distribution based on various operations performed on it. Particular attention is devoted to a concept referred to as Hausdorff saturation, which is considered a first-order approximation of the cumulative distribution function of the Kies distribution and has potential applications in areas such as chemical reaction control, medicine, and risk management.

Paper No. 6 in the list of publications submitted for the competition investigates chaotic behaviour in a dynamical system subject to an additional perturbation. The system is a modification of a well-known epidemiological model and is described by an appropriate system of differential equations. The research extends and improves existing results obtained by other authors concerning such dynamical systems.

The remaining ten papers fall within the field of financial mathematics and, more specifically, address the areas mentioned above: risk analysis and management, American-style derivatives, and yield curves.

Three of the papers are devoted to risk analysis and management. Their two main contributions are the development of alternative approaches to risk assessment that complement the classical Value-at-Risk and Average Value-at-Risk measures, and the use of stochastic models in asset valuation.

Another six papers investigate American-style derivatives, which grant their holders the right to choose the time of exercise. The problem is to determine the optimal exercise time, with the mathematical modelling involving differential equations and game-theoretic problems in cases where early termination of the contract is possible. The research presented in these papers focuses on the classical Black–Scholes model, in which the underlying asset is described by an appropriate normal distribution. Three of the papers investigate classical American-style derivatives, while the other three address variants involving early termination of the contract.

The final paper investigates the yield curve of specific financial instruments. The author proposes a new method for deriving the yield curve when sufficient information is not available. The research is motivated by the Bulgarian government securities market. The proposed approach consists of replacing missing information with an assumption concerning the efficiency of existing affine stochastic short-rate models. The approach is validated using a database of US debt instruments covering the period from 1961 to the present, and the results obtained demonstrate the reliability of the proposed methodology.

Overall, the author's report provides a comprehensive account of the publications submitted for the competition.

Zaevski's research results have received recognition from the scientific community. The candidate has submitted a complete list of citations comprising 221 citations, of which 166 are indexed in Web of Science or Scopus. For the purposes of this competition, a separate list of 99 citations to 30 papers has been provided. Assoc. Prof. Zaevski has declared that none of these 99 citations has

been used in previous procedures for appointment to academic positions or in the procedures for awarding the academic and educational degree of Doctor and the scientific degree of Doctor of Sciences. A brief examination of the citations indicates that they predominantly appear in publications in journals with an impact factor or an SJR indicator.

Assoc. Prof. Zaevski has an active teaching record. He has been, and continues to be, a part-time lecturer at the Faculty of Mathematics and Informatics of Sofia University, where for several years he has taught tutorials in Financial Theory 2 and, since 2019, has delivered lectures in Mathematical Theory of the Financial Market. He has participated in the preparation of two teaching manuals. One doctoral student successfully defended their dissertation under his supervision in 2026.

Assoc. Prof. Zaevski has participated in four research projects. He has been a member of research teams involved in a project for the establishment of a Centre of Excellence, two projects under the National Recovery and Resilience Plan, and one project funded by the Bulgarian National Science Fund (BNSF).

The candidate significantly exceeds the minimum national requirements for appointment to the academic position of Professor and also fulfils the additional requirements set out in the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria at IMI-BAS.

As a critical remark, I would point out the excessive use of Anglicism in the author's report submitted in Bulgarian.

I know the candidate personally and am pleased to note his highly professional attitude towards scientific research, his active teaching and engagement with students and doctoral candidates, as well as his significant contribution to the scientific and organisational activities of the Institute, both as a member of the Scientific Council of IMI and as Secretary and Head of the ORPS Section.

In conclusion, on the basis of the foregoing, I can confidently state that Assoc. Prof. Tsvetelin Stefanov Zaevski fulfils all the necessary requirements for appointment to the academic position of Professor. I therefore recommend that the Scientific Jury propose to the Scientific Council of IMI that Assoc. Prof. Tsvetelin Stefanov Zaevski be elected Professor in the Field of Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Field 4.5. Mathematics, Scientific Specialty: Operations Research.

Sofia, 09.11.2026 Signature:

Prof. DrSc Julian Revalski/