

OPINION

by Prof. Dr. Vejdi Ismailov Hasanov,
Konstantin Preslavsky University of Shumen

on the materials submitted for a participation in the competition
for an occupation of the academic position “Associate Professor”

Professional field 4.5. Mathematics
Scientific specialty "Mathematics (Higher Mathematics)"

In the competition for Associate professor, announced in the State Gazette, issue 9 / 31.01.2025 and on the website of Burgas State University "Prof. Dr. Asen Zlatarov" (BSU) for the needs of the Department of Mathematics, Informatics and Physics at the Faculty of Natural Sciences, the only candidate involved Ch. Asst. Prof. Dr. Meglena Delcheva Lazarova from the Technical University – Sofia.

The following materials were presented to me during the procedure:

- application for participation in the competition; copy of the announcement in the State Gazette; CV;
- copy of the diploma for PhD;
- certificate of fulfillment of the minimal national requirements by group of indicators and the additional requirements of the Bulgarian State University for holding the academic position of "Associate professor" in the professional field 4.5. Mathematics (Appendix 1);
- certificate of scientific contributions; documents certifying the educational, teaching and scientific research activities;
- lists of publications and citations, and copies of the publications themselves.

1. Brief biographical data

Dr. Meglena Lazarova was born in the city of Kardzhali, where she completed her secondary education. During the period 1997 - 2002, she studied at Sofia University "St. Kliment Ohridski", majoring in "Applied Mathematics", as a result of which she obtained Master's degree with the qualification "Mathematician". In 2021, after studying in the doctoral program "Mathematical Modeling and Applications of Mathematics" at the Technical University – Sofia and successfully defending a thesis on the topic "Counting Probability Distributions and Applications in Risk Models", she acquired the "Doctor" degree (PhD).

Dr. Meglena Lazarova's teaching activity as an Assistant professor began in 2011, when she joined the University of National and World Economy. In 2015, she joined the Faculty of Mathematics and Informatics of Sofia University for one semester. Since 2016 until now, he has been working at the Technical University of Sofia in the positions of "Assistant professor", and from 2022 - "Chief assistant professor".

2. General description of the submitted materials

Ch. Asst. Prof. Dr. Meglena Lazarova has submitted one textbook and 13 publications to participate in the competition, of which: 1 is in a journal with a high

impact factor; 4 in a journal that is referenced and indexed in Scopus, and the remaining 8 are in specialized editions of conference proceedings, referenced and indexed in Scopus (Journal of Physics: Conference Series and AIP Conference proceedings).

A report on the fulfillment of the minimal requirements for holding the academic position of "Associate professor" at the BSU "Prof. Dr. Asen Zlatarov" is presented. The fulfillment of the requirements by group of indicators is as follows:

- group „A“ – a copy of the diploma for acquired PhD is presented - 50 points;
- group „B“ – 3 publications are presented as equivalent to a habilitation work – 1 in a journal with a high impact factor in Q1 (the candidate has submitted Q3, which is for the Computer Science category) of Web of Science and 2 in a journal refereed and indexed in Scopus – 135 points (with a minimum of 100 points);
- group „Г“ – 10 publications are presented – 2 in a journal referenced and indexed in Scopus and 8 in specialized editions of conference proceedings, referenced and indexed in Scopus – 300 points (with a minimum of 300 points);
- group „Д“ – 14 citations are presented in refereed and indexed publications in Scopus and/or Web of Science – 112 points (with a minimum of 100 points);
- group „E“ – one university textbook and participation in 7 projects were presented – 110 points (with a minimum of 100 points). From the submitted official notes it is evident that one of the projects is intra-university. I admit 100 points.

The presentation shows that Ch. Asst. Prof. Dr. Meglena Lazarova meets the minimum national requirements and those of the BSU for the academic position "Associate professor" in the professional field 4.5. Mathematics.

3. Reflection of the candidate's scientific publications in the literature (citations)

As noted above, according to the submitted reference, the publications with the participation of the candidate have been cited 14 times in publications that are referenced and indexed in the Scopus and/or Web of Science databases. When checking in the Scopus database, Dr. M. Lazarova has over 30 citations. All this is a sign that the candidate's research has received recognition and good response.

4. General characteristics of the candidate's activity

4.1. Educational and pedagogical activity

Ch. Asst. Prof. Dr. Meglena Lazarova has extensive pedagogical experience. Since joining the UNWE in 2011, she has worked at the Sofia University for one semester and continues to work at the Technical University of Sofia, where she has over 8 years of work experience. Over the years, she has led exercises in various mathematical disciplines, and in the last year she has led exercises at the Bulgarian State University in the disciplines "Applied Mathematics", "Higher Mathematics 2" and "Medical Statistics and Informatics". I have no information about developed curricula. There is a printed textbook „Higher Mathematics I. Selected Chapters“.

4.2. Scientific and scientifically applied activity. Contributions

The scientific publications and achieved results of Ch. Asst. Prof. Dr. Meglena Lazarova can be grouped as follows:

- *Counting probability distributions and processes.* The research in this topic is presented in the publications [1-7] and is a continuation of the topic of the dissertation. In the article [1] a new random process I-Delaporte is proposed, which is a generalized Delaporte process. It is obtained as a result of mixing two processes: I-Polya process and Polya-Aeppli process. In this work and in the following [2-7] the theoretical properties of the considered processes are studied, and from the point of view of application they are presented as counting processes in the risk model.

- *Mathematical modeling in biology and finance.* The publications presented in this topic are [8-13]. In article [8], the characteristics of sigmoidal functions, which are solutions of dynamic systems induced by reaction networks, are studied. The systems studied are modifications of the classical logistic model of Verhulst, borrowing ideas from the Gombertz model. In the following publications [9-10], the research on this type of dynamic systems, which have applications in simulating epidemiological processes, is continued. In publication [13], an extended Merton model for short-term interest rates is considered, in which the movement of the interest rate is given by a stochastic differential equation. The model is used to calculate the price of a zero-coupon bond in the case of a risky market factor and without a risky market factor. In each of the above studies, the theoretical results are supported by numerical experiments.

The candidate's results and contributions are of a scientific-applied nature and are presented in detail and correctly in the author's reference.

5. Assessment of the personal contribution of the candidate

All publications submitted under this competition by the candidate are co-authored. I believe that the contributions of the candidate are not less than that of the co-authors.

I have not found any plagiarism in the publications submitted by the candidate within the meaning of the LDASRB.

6. Critical remarks and recommendations

I don't have critical remarks. I recommend that in her future research work, Dr. Meglena Lazarova obtain and publish independent results.

CONCLUSION:

The documents and materials provided by Ch. Asst. Prof. Dr. Meglena Lazarova satisfy the requirements of the LDASRB, the Regulations for its implementation and the Regulations on the terms and procedures for acquiring scientific degrees and occupying academic positions at the BSU "Prof. Asen Zlatarov" with regard to the academic position of "associate professor" in the professional field 4.5 Mathematics.

Given the above, I propose to the esteemed Scientific Jury to prepare a report-proposal for the election of Ch. Asst. Prof. Dr. Meglena Lazarova to the academic

position of "associate professor" in the professional field 4.5. Mathematics, scientific specialty "Mathematics (Higher Mathematics)" at BSU "Prof. Dr. Asen Zlatarov".

June 11, 2025

Member of the jury:
/Prof. Dr. Vejdi Hasanov/