

## REVIEW

from prof. Eugenia Assenova Stoimenova, IMI-BAS

Professional direction 4.5 Математика (Speciality: Probability theory and mathematical statistics)

for competition of academic position of 'Associate Professor' for the needs of NBU in Professional direction 3.7. Administration and management (Quantitative methods in management), announced in SG No. 95/08.11.2024 г.,

with candidate **Senior Assistant Professor Dr. Ekaterina Tzvetanova-Georgieva**

### **I. Assessment of compliance with the minimum national requirements and the requirements of the New Bulgarian University**

Senior assistant professor Dr. Ekaterina Tzvetanova-Georgieva has submitted documents for participation in the competition for the academic position of "associate professor". All the documents are in accordance with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the relevant specific requirements of the NBU for this position. The evidence presented shows that Dr. Ekaterina Tzvetanova-Georgieva has fulfilled the minimum national requirements for scientific and teaching activities for the field of higher education 3. Social, economic and legal sciences, defined by the Regulations for the Implementation of the Act on the Development of the Academic Staff in the Republic of Bulgaria, as well as the requirements of the Regulation on the Development of the Academic Staff of the NBU (NRAS) and Annex 2. Minimum national requirements and requirements of the NBU, which candidates must meet to acquire a scientific degree and to occupy the academic position of " Associate Professor ".

The table shows the exact number of points according to the minimum requirements of ZRASRB and NRAS of NBU and the respective performance of the candidate.

<b>Group of indicators</b>		<b>minimum requirements</b>	<b>Candidate performance</b>
A	Indicator 1	50	<b>50</b>
Б	Indicator 2	0	<b>0</b>
B	Indicator 3	100	<b>100</b>
Г	Sum of 4 до 10	200	<b>246,13</b>
Д	Sum of <b>indicators</b> 11 to 13	50	<b>120</b>
Е	Sum of <b>indicators</b> 14 to 21	0	<b>0</b>
Ж	Sum of <b>indicators</b> 22 to the end (mandatory for the NBU)	50	<b>70</b>
З		70	<b>100</b>
И		50	<b>80</b>

It can be seen that the points on all indicators exceed the minimum number of points, and on some groups of indicators they significantly exceed them.

Ekaterina Tzvetanova-Georgieva graduated from the College of Management, Trade and Marketing - Sofia with a Bachelor degree in Economics in 2010. She completed the Master Program in International Business at the New Bulgarian University in 2013 and studied for three semesters in the Master Program in Statistics and Financial Econometrics at the Faculty of Economics, Sofia University "St. Kliment Ohridski" in 2013-2014. In the period 2014 - 2017 she was a full-time doctoral student in the Department of Administration and Management of the New Bulgarian University. She defended her dissertation for doctoral degree on the topic: "Adapting the Altman Model for Assessing the Risk of Corporate Insolvency for Bulgarian Case" in the scientific field "Administration and Management", scientific specialty "Business Administration".

Senior Assistant Professor Dr. Ekaterina Tsvetanova-Georgieva has been a lecturer at NBU since 2018, holding the academic position of "assistant" since January 2018, and "senior assistant" since December 2019. In November 2024, she presented to the academic community of NBU her monograph on the topic: "Indices of the health status of the population in Bulgaria. Can social progress save more lives than medicine?" Senior Assistant Professor Dr. Ekaterina Tzvetanova-Georgieva has been the Dean of the Faculty of Basic Education at the New Bulgarian University since July 2024. She was the Director of the School of Professional and Continuing Education at NBU from July 2021 to September 2024. She has additional professional experience as a consultant - analyst in a management consulting company (2015 - 2017) and a junior macroeconomic analyst (in 2014).

## **II. Research (creative) activity and results**

### **1. Evaluation of the monographic work, creative performances or other publications, corresponding in volume and integrity of the monographic work, including evaluation of the scientific and scientific-applied contributions of the author.**

The monograph "**Indices of the health status of the population in Bulgaria. Can social progress save more lives than medicine?**" is an in-depth study of the quantitative factors that characterize the health status of the Bulgarian population. Health factors such as the level of healthcare and health behavior, as well as factors from the socio-economic and physical environment, are analyzed. An index for assessing the health status of the population in Bulgaria is proposed. The index takes into account the characteristics of the different national regions. Recommendations are made for improving the health status of the population at the national and regional levels. The topic is contemporary and relevant and is consistently and logically developed, in view of the growing importance of healthcare

management in Bulgaria.

The monograph is 224 pages long, over 300 literary sources are used, and contains a large number of figures and tables. The content includes a preface, five chapters of an exposition on the main theses of the study, a conclusion, two appendices and a bibliography. From the presentation of the text. It is clear that the author is a specialist with significant knowledge in the field of research.

In the first chapter, an in-depth analysis of the various conceptual models for assessing the health status of the population is made. The lack of reliable data on which to base the models are identified. The construction of a health status index as a model for assessing the health status of groups of the country's population is motivated. In the second chapter, the main health indicators that describe the current status of the population of Bulgaria are analyzed. This includes the four health determinants: health behavior, clinical care, socio-economic and physical environment. The third chapter presents a complex methodology for constructing the health status index, which is one of the significant contributions of the monograph. The chosen approach is based on good practices in the construction of composite indices. Two methods for estimating the weights of health indicators in a linear regression model and analysis of principal components are applied. The essential health indicators for assessing health status have been defined. The fourth chapter is dedicated to the practical application of the proposed models. Based on a developed methodology, health status indices have been calculated for each of the 28 administrative regions in Bulgaria for the period 2011–2023. The contribution of each of the health indicators has been assessed. The inclusion of social, economic status and environmental factors contributes to outlining the specifics at the regional level and thus the application of the index will be of great benefit for developing an adequate health policy that takes into account local specifics. The fifth chapter analyzes the results in two directions – by geographical areas and by years. The comparative analysis by areas has significant value from a practical point of view for developing dynamic models at the regional level and, more specifically, for supporting the process of developing the health map, determining the needs for health and medical services and the available resources for this. The risks to the health status of the Bulgarian population have been mapped. The analysis of administrative districts by groups allows to derive recommendations and form decisions by governing authorities to improve the health status of the population.

In conclusion, I would like to note that the monograph is written in a precise and accessible language for both specialists in the field and specialists in related fields. To understand the results and conclusions, it is not necessary for the reader to be familiar with the mathematical models. At the same time, these models are extremely useful for researchers working in the field of mathematical modeling in healthcare.

In connection with the preparation of the monograph, four articles were published in non-refereed publications [group D, indicator 7, position 11, 23, 25 and 26].

**2. Evaluation of the contributions in the other attached publications (creative performances) made after the appointment of the academic position "Chief Assistant. It also includes an assessment of the peer review requirement.**

The main scientific and research interests of Dr. Ekaterina Tsvetanova-Georgieva are mainly in the field of quantitative methods in business environment management. The emphasis in her research activity is the creation of mathematical models and the application of quantitative methods for solving problems both at the administrative level of a given company or group of companies, and at the macroeconomic level. To participate in this competition, she has submitted 30 articles and scientific reports in peer-reviewed publications or edited collective volumes. 11 of the publications are self-authored and 19 are co-authored. All of them were published after the defense of a doctoral degree and after the competition for the academic position of "chief assistant".

The candidate Senior assistant Dr. Tsvetanova-Georgieva has described correctly her scientific and scientific-applied results in the following topics.

The first research topic is related to "A model for predicting the risk of bankruptcy of Bulgarian non-public companies". A new, adapted model for predicting the risk of bankruptcy of Bulgarian non-public companies, which is the subject of her dissertation work, has been proposed. On this topic, 2 articles have been published [group D, indicator 7, position 1 and 2] in non-refereed publications and one publication that is referenced in SCOPUS – Q2 [group D, indicator 8, position 1].

The second significant research topic is related to the "Model for assessing the credibility of sociological agencies". 8 articles have been published, related to: (i) a consolidated forecast of the results of the elections, which is based on a quantitative assessment of the long-term credibility of sociological assessments and a meta-analysis of the announced polls for electoral attitudes; and (ii) an assessment of the credibility of sociological agencies before and after the elections according to a developed methodology assessing the accuracy of sociological agencies, a "success-failure" forecast and an assessment of professional correction. The candidate's contribution is mainly related to the collection and processing of input data, analysis of the obtained quantitative results, as well as updating the used methodology (modifying indicators, adding evaluation parameters, etc.).

The third research topic is related to "Application of quantitative methods for solving macroeconomic problems". Methods for solving various macroeconomic problems have been studied, such as estimating the price elasticity of fuel consumption, GARCH models and Monte Carlo simulations for estimating currency pairs, price elasticity of goods from the consumer basket of Bulgaria. 2 articles [group D, indicator 7, positions 7, 8] and one study [group D, indicator 9, position 2] have been published in non-refereed journals. The

focus of the developments is in: (i) Research on the price elasticity of electricity and liquid fuels consumption [group D, indicator 7, position 7]. Linear regression models for price elasticity were constructed, from which the most accurate ones were selected based on an iterative process. In addition to price elasticity, the elasticity of income relative to the price of goods constituting the consumer basket is also modeled [group D, indicator 9, position 2]; (ii) Application of autoregressive conditional heteroskedastic models (GARCH) with one and two modes for forecasting the dispersion of a currency pair. A GARCH model with a Markov switching mode is also constructed. Monte Carlo simulation is also used to calculate the value at risk (VaR).

The fourth research topic is related to "Analysis of the macro environment and changes in the way companies are managed". The focus of the developments is: (i) Analysis of the potential impact of the development of artificial intelligence on corporate governance and, in particular, human resource management. [group D, indicator 7, position 4]; (ii) Analysis of corporate practices in turbulent conditions – COVID-19. [group D, indicator 7, positions 5 and 6]. Characteristics that support the company's resilience in conditions of uncertainty are derived and good practices that will ensure their future development as well; (iii) Analysis of the opportunities for companies and universities that arise from microcrediting as a form of certification of knowledge and skills is presented including the field of continuing education, [group D, indicator 7, position 13]. The advantages and disadvantages of this form are derived.

The fifth research topic is related to "Application of quantitative methods in agribusiness". Six articles have been published in non-refereed publications [group D, indicator 7, positions 3, 9, 10, 12, 22 and 24] and 2 studies – one in a non-refereed journal [group D, indicator 9, position 1] and one in a refereed journal [group D, indicator 8, position 2]. The focus of the developments is: (i) Application of the AHP method to increase the management competence of agricultural cooperatives; (ii) Assessment of the economic efficiency of the application of biostimulants, based on empirical data for rapeseed and oats [group D, indicator 7, positions 9 and 10]. A linear programming method was applied to solve two problems in order to maximize profit and gross margin. Author's contribution includes: participation in the preparation of the problems, analysis of the obtained results; (iii) Preparation of a typology that describes typical farms in European Union countries. Four types of farms were derived based on empirical data collected from 6 European countries [group D, indicator 9, position 1]. Principal component analysis and cluster analysis were applied to identify the types of farms. Author's contribution includes: participation in the development of the questionnaire, data collection and processing, preparation and editing the paper, application of principal component analysis and interpretation of the results obtained from the cluster analysis as well. (iv) Preparation of a structure for a digital application that will implement a socio-economic assessment of the implementation of soil restoration strategies [group D, indicator 7, positions 12 and 24]. The tool includes three

modules covering gross margin, partial budget, optimization and a partial life cycle assessment that assesses the impact of the activity on carbon emissions levels. Author contribution includes: participation in the choice of the applied structure, implementation of the selected quantitative analyses; (v) Assessment of the degree of influence of the socio-economic parameters of farms implementing soil restoration strategies on supply chain cooperation, public-private partnerships and landscape associations in Austria and Bulgaria based on ANR analysis [group D, indicator 7, position 22]. The aim of the assessment is to identify new socio-economic opportunities that can be targeted for public policies. Author contribution includes: participation in deriving criteria and alternatives, preparing questionnaires, conducting interviews, processing data and analyzing the results; (vi) Analysis of the incentives applied within selected countries and farms participating in the NOVASOIL project. The mapping was implemented based on an adaptation of the Business Model Canvas. The goal is to analyze how they contribute to the current state of the business model and to improving soil health. Through this process, the aim is to answer the question of how business models related to soil health can effectively contribute to maintaining sustainable and competitive agriculture. Author's contribution includes: participation in a questionnaire development, databases development, processing and consolidating information, deriving results from the processed information, preparing the publication. The models developed with the participation of the candidate may be useful for researchers working in the field of mathematical modeling in economics.

All submitted scientific materials (monograph and scientific papers) are in full accordance with the announced topic of the current competition. Ekaterina Tsvetanova-Georgieva has significant scientific and applied results and, which is no less valuable, indisputable applicability of her research for making management decisions through the application of quantitative methods and mathematical models.

### **3. Citation from other authors.**

The presented list of 15 citations of 9 articles is in accordance with the minimum requirements of the ZRASRB and the NRAS of the NBU.

### **4. Evaluation of the results of participation in research and creative projects and application of the obtained results in practice.**

It is clear from the CV that Senior Asst. Prof. Dr. Ekaterina Tsvetanova-Georgieva has participated in seven research projects.

Her participation in several research projects, funded under Horizon 2020 and by the Research Fund, is related to the application of various quantitative methods in the field of agribusiness. This includes: participation in the development of questionnaires, data

collection and processing, participation in the selection of the structure of the application, functionalities and implementation of the selected quantitative analyses, analysis of the results obtained and other activities. Ekaterina's participation in the NOVASOIL project, funded by the 2020 Programme of the European Commission for 2022-2025, is related to a questionnaire development, the databases development, the processing and consolidation of information, the output of results from the processed information, the preparation of a publication.

Participation in the application of scientific results in practice is an important activity for every scientist and undoubtedly Dr. Tzvetanova-Georgieva has a diverse and essential role in these projects.

### **III. Teaching and learning activities**

Candidate Ekaterina Tsvetanova-Georgieva is a Senior assistant professor in the Department of Administration and Management at NBU. Her main responsibilities include: teaching, evaluating, developing course content in Moodle; promoting the curricula in and outside of candidate student campaigns. The main courses include: Risk Management, Business Financing and Innovation, Principles of Microeconomics, Economic Fundamentals of Business, Modern Economics, Corporate Governance and Organizational Development, Principles of Business Statistics, Quantitative Methods of Analysis and Control, etc.

In addition to teaching courses in the curricula, Dr. Ekaterina Tzvetanova-Georgieva provides scientific supervision of students, writing reviews, and participating in committees. She has provided internships to students in the formats of Sofia Business School (2021, 2022 and 2023) and Management Academy (2022 and 2023)

The average grades from student surveys for the last 10 semesters are excellent 4.56 out of a maximum of 5. This is an excellent indirect attestation of the candidate's teaching skills and responsibility.

### **IV. Administrative and public activities.**

#### **1. Participation in collective governing bodies of NBU.**

The attached official notes show that Dr. Tsvetanova-Georgieva is engaged in several leadership activities at NBU. She was part of the Program Council of the department. She fulfilled her academic duties regularly - participation in the Department Council, Program Council, regular conduct of the educational process and compliance with working hours. She was a member of the Accreditation Committee at the Master and Bachelor Faculties of NBU.

From July 2021 to September 2024, she was the Director of the School of Professional and Continuing Education at NBU. Her duties include: Organizing public lectures, short-

term training, professional qualifications, workshops, master and professional classes, etc. forms of training other than the academic educational activities of NBU.

From July 2024 to the present, Dr. Ekaterina Tzvetanova-Georgieva is the Dean of the Faculty of Basic Education of NBU. Her duties include managing the educational process aimed at first and second-year bachelors.

## **2. Public activity.**

Ekaterina Tsvetanova-Georgieva actively participates in organizing and conducting scientific events, workshops, and scientific seminars. She participated in the organization and conduct of the 17th Vienna Future Dialogue 2020.

## **Conclusion**

The analysis of the submitted materials in the competition shows that Dr. Ekaterina Tzvetanova-Georgieva is a highly qualified researcher who has significant contributions in the field of quantitative methods in business management. I believe that the set of criteria and indicators for the acquisition of the title "Associate Professor" is satisfied in accordance with the LADAS.

I propose that the Scientific Jury vote positively and recommend to the academic bodies of NBU to award Dr. Ekaterina Tsvetanova-Georgieva the scientific title of "Associate Professor" in the professional field 3.7 Administration and Management (Quantitative Methods in Management).

16.02.2025

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