S T A N D P O I N T

From: Prof D.Sc. Zhelyu Vladimirov, Sofia University “St. Kliment Ohridski”, professional field: 3.7. "Administration and Management"

On: scientific works of Assoc. Prof PhD Stanimir Ivanov Kabaivanov, presented for participation in a competition for the academic position "professor" in the field of higher education 3. Social, economic and legal sciences, professional field 3.8. Economy (Finance), announced in SG, issue 57 of 26.06.2020

Grounds for the standpoint: Order of the Rector of Plovdiv University "Paisii Hilendarski", R 33-4134/25.08.2020.

1. Brief introduction of the candidate

Assoc. Prof PhD Kabaivanov has a total of 85 publications, of which 45 are presented for participation in the competition for "professor". These works include: a monograph (155 pages); 20 articles and studies published in journals and conference proceedings indexed by Scopus and Web of Science; 24 articles and reports published in non-indexed journals or in collectively edited volumes. The texts submitted for participation in the competition do not repeat previous ones related to the acquisition of the scientific-educational degree "Doctor", academic position "Chief Assistant" and "Associate Professor". The candidate has 29 citations in Scopus and Web of Science and respectively h-index 3 in both world databases; 13 citations in monographs, 20 citations in other peer-reviewed editions and 1 citation in another edition (63 citations in total).

Assoc. Prof Kabaivanov reads courses and has developed curricula in Corporate Finance; Econometrics; Applied analysis of financial data and modern methods for investment analysis. In the last five years he has a total of 2043 hours of lectures and 352 hours of seminars. He is the supervisor of three doctoral students, one of whom successfully defended the dissertation. He has participated in 9 projects, two of which he was the leader and one - the coordinator. He is a co-author of a registered utility model (2863 - class B64C 39/02, G05D 1/10, "Integrated control system for autonomous unmanned aerial vehicles"). Assoc. Prof Kabaivanov has been the Dean of the Faculty of Economics and Social Sciences since 2014, and since 2019 is the Chairman of the Budget Committee of the University of Plovdiv “*Paisii Hilendarski*”. He has participated in 5 scientific juries for "Associate Professor", 5 for "Chief Assistant", 10 for PhD, as well as in 3 procedures as a member of the Standing Committee of NEAA for program accreditation (2 at UNWE and 1 at EU - Varna).

The candidate was a lecturer in the Erasmus IP program for 3 weeks in Iasi, Romania; he is a member of The Econometric Society; Financial Engineering Solutions; guest editor of Algorithms (special edition "Big Data Analytics, Algorithms and Programming"); guest editor of a special edition of The International Journal of Interactive Multimedia and Artificial Intelligence from the international conference "Applied Modeling in Economics, Finance and Social Sciences 2019"; reviewer for Heliyon magazine; guest editor of a special edition of Entropy ("Statistical Physics for the Digital Economy").

With the submitted works and with the active teaching and administrative activity the candidate fully meets the minimum national requirements under Art. 2b, para. 2, 3 and 5, as well as the requirements under Art. 29, para. 1 and 2 of LDASRB, as well as the additional requirements of FESS of Plovdiv University "Paisii Hilendarski" in the field 3. Social, economic and legal sciences, PN 3.8. Economics (Finance). To my knowledge of the areas of research of Assoc. Prof Kabaivanov, no plagiarism is found in the publications submitted for the competition.

2. General characteristics of the candidate's works

The research work of Assoc. Prof Kabaivanov is focused on the application of mathematical and statistical methods for analysis and modelling of data in the field of finance and social sciences. These works can be grouped in the following areas: *Econometrics, Corporate Finance, Analysis of Financial Markets and Application of Mathematical and Statistical Methods for Research of Economic and Social Problems*.

2.1. Econometrics (№№ 12_1, 12_9, 12_17, 12_18, 12_25, 12_28, 12_40). The econometric methods are applied applied for analysis of various issues in the field of financial markets, corporate finance, economic and social problems, so here I am presenting some more important publications. Article 12_9 demonstrates how an option-based approach to resource management can provide information on rare events and allow the re-use of derivative pricing methods to improve natural resource management. The long-term impact of market information on pollution and risk control instruments on environmental management decisions is revealed (12_1). The applications of neural networks for estimating the parameters of an economic model are analysed in order to accelerate the process of calibration of econometric models (12_25). An assessment of the level of technological readiness is developed in publication 12_18, while article 12_28 analyses the application of machine learning to improve the efficiency of alumni organizations in universities. Publications 12_17 and 12_40 are devoted to cyber-attacks problems and the possibilities for their early detection and limiting the consequences. The proposed solutions are based on different self-learning algorithms that can respond to the changing threat profile.

2.2. Corporate finance (№№ 12_11, 12_16, 12_20, 12_37). A model for measuring the opportunities and risks of developing new drugs is constructed, and it is tested on the ability of Bulgarian pharmaceutical companies to develop new products (12_11). The applications of a modified binomial tree method for real options analysis are disclosed in article 12_16, while the article 12_20 shows the use of artificial intelligence for better understanding of changes in the real estate market. Based on data on the performance of employees in a high-tech company, problems related to the reporting of random events, the averaging of estimations and the stability of implemented practices are solved (12_37).

2.3. Analysis of financial markets (№№ 12_0, 12_2, 12_10, 12_12, 12_14, 12_15, 12_21, 12_22, 12_26, 12_38, 12_41). The monograph "Intelligent Systems and Self-Learning Algorithms for Analysis of Financial Instruments" reveals the possibilities for applying different types of training in solving financial problems. Bond indices and yield curves are analysed, as well as additions to the methods for conducting stress tests. The benefits of blended learning in the study of market changes and transitions from one state to another are shown. Cryptocurrency markets and the applicability of different econometric models for their analysis are studied in 12_2 and 12_41. Special attention is paid to the accuracy of the instruments used (12_2), while the application of neural networks and other models of machine learning in stock markets is analysed in Article 12_41.

A pricing algorithm for single and double barrier options is implemented, using the Melin transformation with maximum entropy inversion and its suitability for real applications (12_12). A solution to the problem of pricing discrete options with a double barrier using the Milev-Tagliani algorithm is proposed (12_15). Article 12_22 presents an approach for assessing barrier options using an iterative algorithm based on the Melin transformation, implemented in C ++ and tested on real cases of estimation. Article 12_21 discusses the problems related to the evaluation of the Value at Risk indicator. The significance of time

series anomalies for financial markets is revealed in 12_38. Various approaches to accelerating deep learning using a graphics processor (GPU) and parallel computing frameworks are presented (12_26).

Based on stochastic processes to simulate debt changes, the effect of the Bulgarian government debt on the national economy and growth forecasts is analysed (12_10), while the article 12_4 uses an original approach to study the financial crises and a method for assessing the effects associated with the transfer of economic problems.

2.4. Application of mathematical and statistical methods for research of social problems 12_39, 12_42, 12_43, 12_44). These publications offer an econometric analysis of important social issues related to social movements and attitudes. The use of uncontrolled classification methods to support social policy decision-making is discussed in 12_39. Based on data from a representative national survey of 1,030 young people, the differences in their participation in informal volunteering, associations and civil protests 25 years after the regime change are explained.

Publications 12_3, 12_4, 12_5, 12_6, 12_7, 12_8, 12_13, 12_19, 12_24, 12_27 and 12_29 - 12_35 use statistical and mathematical methods for comparative analysis of data from the SAHWA project. The obtained results contribute to a better understanding of social processes in five Mediterranean countries (Algeria, Egypt, Lebanon, Morocco and Tunisia) in the context of the so-called *Arab Spring*. The role of youth movements in these countries is revealed (12_3); the misunderstanding of these events by the international community (12_4); the differences in the use of leisure time by young people in these countries compared to western states (12_33); the impact of the life cycle on young people's leisure time, money and activities (12_30). It is shown that the situation with the transition of young people to adulthood in these countries is neither unbearable for them, nor socially unstable (12_5 and 12_6). It is examined whether machine learning can help to improve the analysis of this transition by outlining the characteristics of youth groups (12_19). The labour characteristics of employed young people with completed education are analysed (12_32), while the work careers of young men and women with different social backgrounds, education and residence from these countries are compared in articles 12_27 and 12_34.

An overview of youth policy in the five Arab Mediterranean countries is provided in article 12_31. Articles 12_7 and 12_8 outline the degree and types of political and religious participation among young people in these countries. The mechanisms for the formation of a youth political elite in Central and Eastern Europe and the Arab Mediterranean countries are compared in article 12_24. It is proven that the political engagement of young people is most strongly influenced by university education and growing up in a politically engaged family (12_13 and 12_29). The article 12_35 reveals why the combination of neoliberal policies and Arab and Islamic culture in the region prevented the demographic explosion of youth cohorts in the early 21st century. Publications 12_36, 12_42, 12_43, 12_44 also use statistical and mathematical methods for comparative analysis of data from the GEMM and SAHWA projects. The research is focused on the analysis and modelling of the attitudes and problems of young people related to their professional paths, migration and integration into the labour market.

In spite of the social orientation of these studies, they allow the application of mathematical and statistical methods to different types of tasks, as well as the analytical tools of the social sciences help to enrich the statistical and mathematical analysis of financial data.

3. Specific significance of the contributions to science and practice

The review of the works submitted for the competition by Assoc. Prof Kabaivanov shows that these are studies that meet high scientific standards. The analysis of the

publications reveals that the candidate has contributions in promising areas of econometric modelling, analysis of financial markets, corporate finance and the application of mathematical and statistical methods for the study of economic and social problems. In particular, these contributions include:

- Testing an original approach to the study of financial crises, as well as a method for assessing the effects associated with the transfer of economic problems (12_14);
- Providing proved methods for effective estimation of options (including exotic derivative instruments), as well as linking the obtained results with management decisions and their long-term effects (12_1, 12_9, 12_12, 12_16, 12_22, 12_26);
- Innovative approaches for the application of Monte Carlo in the analysis of derivative instruments and problems in the field of corporate finance (12_10, 12_15, 12_20, 12_25, 12_38);
- Solutions to problems related to the assessment of innovative projects and management of company resources through intelligent data analysis systems and real options (12_11, 12_18, 12_37);
- Revealed opportunities for segmentation of social groups through the use of uncontrolled training, allowing comparison of clusters discovered by real data with those proposed by different theories (12_19);
- Application of statistical and mathematical methods for better understanding of the data obtained from the study of significant social processes (12_3, 12_4, 12_5, 12_6, 12_7, 12_8, 12_13, 12_24, 12_29-35, 12_36, 12_42, 12_43, 12_44).

3. Conclusion

The presented publications of the candidate reveal in-depth knowledge of the problems related to the study of financial crises, valuation of options, application of Monte Carlo for analysis of derivative instruments, use of intelligent systems for data analysis and real options, and application of statistical and mathematical methods for studying economic and social processes. Assoc. Prof Kabaivanov has conducted independently and in collaboration with other researchers a large number of empirical studies with proven practical effect. The obtained results show that he possesses significant skills for generalization and formulation of significant conclusions. A significant part of the presented works is directly related to the courses taught by the candidate. The problems investigated by the candidate are among the leading ones in the respective scientific fields and the obtained results add value to the existing knowledge. Evidence of this is the large number of articles and studies published in journals and conference proceedings indexed by Scopus and Web of Science. With these publications and with his active teaching, administrative and international activities, Assoc. Prof Stanimir Kabaivanov stands out among the leading researchers in his field in Bulgaria.

All this gives me reason to recommend to the esteemed scientific jury to award Assoc. Prof PhD Stanimir Ivanov Kabaivanov the position of "professor" in the field of higher education 3. Social, economic and legal sciences, professional field 3.8. Economics (Finance).

Желю Владимиров

Digitally signed by Желю Владимиров
Date: 2020.09.18 14:48:39 +03'00'

21.09.2020 Prof D.Sc. Zhelyu Vladimirov
Sofia