OPINION

by Prof. Dr. Veselin Ivanov Hadjiev
regarding the dissertation work of Mihail Veselinov Yanchev for awarding the educational and scientific degree "Doctor" on the topic " Modeling economic uncertainty: Methods, assessment and applications of probabilistic forecasts "

The opinion is drawn up on the basis of Order No. RD 38-454 / 10 . 07 . 2023 of the Rector of Sofia University "St. Kliment Ohridski". The opinion is given by Prof. Dr. Veselin Ivanov Hadjiev from the University of Economics-Varna. The author of the dissertation for the award of the educational and scientific degree "Doctor" is Mihail Veselinov Yanchev, a full-time doctoral student at the Faculty of Economics of Sofia University "St. Kliment Ohridski"-Sofia. The topic of the dissertation is "Modeling economic uncertainty: Methods, evaluation and applications of probabilistic forecasts".

1. Overall assessment

According to the submitted certificate, doctoral student Mihail Yanchev meets the minimum national requirements for awarding the educational and scientific degree "Doctor" in District 3 "Social, Economic and Legal Sciences". The Faculty of Economics at Sofia University "St. Kliment Ohridski" has an accredited doctoral program in professional direction 3.8 "Economics", specialty "Economics and Management (Industry)".

The dissertation submitted for opinion is in the form of a monographic manuscript. It corresponds to the scientometric requirements of volume, structure, sources of information, etc. for awarding an educational and scientific degree. The total volume of the dissertation is 156 pages and appendices, structured in three chapters, introduction, conclusion and bibliography. The bibliography includes more than 300 sources from foreign authors.

The research is up-to-date and contributes to the development of the toolkit for probabilistic forecasting. The author aims to build a framework that can be used by decision makers when it comes to forecasting important economic parameters. In addition, the study aims to popularize and encourage the use of probabilistic forecasts in situations characterized by an increased degree of risk and uncertainty.

The exposition is presented through a logical structure - theoretical framework, tools, approbation. Solid knowledge of economic forecasting theory and uncertainty is established. The author demonstrates very good knowledge and skills in the field of statistical and econometric methods, neural networks, mathematical statistics, etc. Through the built framework in the third chapter, the author makes an approbation and comparison of the accuracy of quantile probabilistic regression. It proves the better capabilities of its approach under conditions of uncertainty. Calculations and simulations were performed using Python , R , etc.

The dissertation uses data from official sources and from sources of cited authors.

The results of the dissertation have been shared with the scientific community through two publications, one of which is in an edition referenced and indexed in global databases.

The abstract has a total volume of 66 pages. It presents the content and highlights of the dissertation in a correct and synthesized way.

2. Evaluation of contributions

The dissertation submitted for defense has a theoretical-applied character. It can be considered as a basis for building concrete information systems for probabilistic forecasting.

In general, contributions can be grouped as follows:

- The author develops a new forecasting method using a neural network architecture for probabilistic time series forecasting (DQPR) ;
- The author demonstrates the superior performance of DQPR compared to reference models in forecasting pandemic-related recessions in four Eastern European countries and the gas hub Balkans;
- With the help of a Bayesian version of DQPR, the author develops fan-shaped graphs of inflation in Bulgaria, etc.;

3. Notes and recommendations

The work proposed for discussion has a theoretical-applied nature. If there is any weakness to be noted, it is the setting of more tasks than is expected of a dissertation for the educational and scientific degree of Doctor. Of course, this finding does not make the doctoral student's work any less valuable.

I would like further clarification on the following issues:

- Are the advantages of probabilistic forecasting in economics only valid under conditions of uncertainty or in principle ?

- the absence of Bulgarian authors in the list of sources mean that these problems have not been discussed in Bulgaria ?

4. Conclusion

The thesis proposed for opinion "Modelling of economic uncertainty: Methods, evaluation and applications of probabilistic forecasts", developed by Mihail Veselinov Yanchev, has the necessary qualities to be protected for obtaining the educational and scientific degree "Doctor" in District 3 "Social, economic and legal sciences". ***This gives me the reason to propose to the members of the esteemed jury to vote positively for awarding the educational and scientific degree "Doctor" to Mihail Yanchev.***

15/09/2023

Varna, Prof. Dr. V. Hadzhiev