<u>**University of National and World Economy (UNWE)**</u>

OPINION

by **Assoc. Prof. Kamelia Boyanova Assenova, PhD**
UNWE
Scientific Field: 3. Social, Economic and Legal Sciences
Professional Field: 3.8 Economics

regarding the dissertation submitted for the award of the educational and scientific degree **"Doctor" (PhD)** entitled:

"Problems in the Valuation of the Fair Value of Public Companies and Enhancing Its Reliability"

Author: **Stefani Georgieva Andreeva**
Academic Supervisor: **Prof. Reneta Dimitrova, PhD**

The dissertation comprises 231 pages and includes a title page, table of contents, list of abbreviations, list of tables, list of figures, introduction, three chapters, conclusion, and references. It contains 54 tables and 22 figures. The bibliography includes 91 literature sources and scientific articles, as well as 24 internet sources.

1. Significance of the Research Problem from a Scientific and Applied Perspective

The dissertation addresses a topic that is highly relevant and significant both scientifically and practically. In the context of dynamically developing capital markets, increasing uncertainty, and growing requirements regarding financial reporting and corporate governance, issues related to the valuation of the fair value of public companies have become particularly important. A well-founded determination of fair value is essential for investors, managers, financial analysts, auditors, and regulatory authorities. The study contributes to the development of theoretical concepts and to the improvement of practical approaches to the valuation of public companies.

2. Justification of the Objectives and Tasks of the Dissertation

The objective of the dissertation is clearly formulated and logically derives from the research problem. The tasks are consistently structured and aimed at achieving the main objective: the development of a methodology for valuing public companies that builds upon the classical principles of the DCF method while enhancing them through quantitative modeling of uncertainty.

The tasks encompass both a theoretical analysis of existing approaches and valuation methods and the identification of problematic areas and opportunities for improving the reliability of valuations. There is a logical connection between the subject of the research, the objectives, and the expected results.

3. Correspondence Between the Selected Research Methodology and the Dissertation Objectives

The methodology used is appropriate to the nature of the research problem and the stated objectives. The application of comparative analysis, financial and economic analysis, valuation models, and empirical studies allows for a comprehensive examination of the problems involved in determining the fair value of public companies. The selected methodology provides the necessary reliability and validity of the conclusions and recommendations made.

Particularly noteworthy is the in-depth analysis of classical discounted cash flow valuation models, beginning with the Williams model and the Gordon model and extending to contemporary DCF models for valuing equity and firms. The author does not merely present existing approaches but critically analyzes their limitations arising from deterministic assumptions regarding key parameters such as growth, profitability, and cost of capital.

The distinction between endogenous (referred to as "ednogenous" in several places, likely due to a technical error) and exogenous sources of uncertainty, as well as the examination of their impact on valuation results, is methodologically well-founded. The need to move toward probabilistic modeling of input parameters is logically and consistently justified.

The developed methodology for integrating Monte Carlo simulations into DCF models represents a significant extension of the traditional approach. It includes clearly defined stages: identification of key variables, sensitivity analysis, selection and justification of probability distributions, determination of correlations among variables, simulation execution, and interpretation of results.

Particularly valuable is the proposed algorithm for selecting parameters to be modeled as random variables, as well as the justified choice of different probability distributions according to the economic nature of the respective indicators.

The practical validation of the methodology through the specialized software Oracle Crystal Ball contributes to its reliability and applicability. Consequently, it may be concluded that the methodology and methods used are fully adequate for the objectives of the dissertation and provide a high degree of credibility to the obtained results.

The strengths of the methodology include:

1. **Clear logical sequence** – tracing the evolution from discount models to modern DCF approaches; the limitations of traditional models are well argued and serve as the basis for introducing Monte Carlo simulations.
2. **Strong theoretical foundation** – reliance on established authors such as Williams, Gordon, Blume, Vasicek, Pratt, and Damodaran; the roles of CAPM, the beta coefficient, and WACC are correctly explained.
3. **Methodological contribution** – the main scientific value lies in the proposed procedure for integrating Monte Carlo simulations; proper emphasis is placed on identifying uncertain parameters and conducting sensitivity analysis.
4. **Practical orientation** – the use of Oracle Crystal Ball is justified, and specific distributions for different input variables are presented.

In my view, the most significant original contribution of the dissertation is the development of a comprehensive methodological framework for integrating Monte Carlo simulations into DCF valuation of public companies. A review of the literature indicates that similar approaches have been addressed only fragmentarily, while a sufficiently detailed, structured, and practically applicable methodology has been lacking. In this respect, the author's contribution is original and enriches both the theory and practice of business valuation.

The scientific contribution of the developed methodology may be summarized in the following stages:

- A systematic algorithm for selecting variables;
- Criteria for selecting probability distributions;
- A procedure for sensitivity analysis prior to simulation;
- Introduction of correlations among input factors;
- Rules for interpreting results.

My comment to the doctoral candidate is that, although these stages are described in the dissertation, they are scattered throughout the text, and the methodology is not presented as a single algorithm that could be readily applied to the valuation of other companies.

4. Scientific and Applied Contributions of the Dissertation

The dissertation contains scientific, scientific-applied, and practical contributions with clear elements of originality.

Scientific Contributions

- A conceptual framework has been developed for integrating probabilistic modeling into the valuation process of public companies using the discounted cash flow method.
- The main sources of uncertainty in the application of the DCF method have been systematized and classified as endogenous and exogenous factors, and their impact on valuation has been analyzed.
- A consistent methodology has been proposed for selecting probability distributions depending on the economic nature of the various DCF model input parameters.

Scientific-Applied Contributions

- An original methodological framework has been developed for integrating Monte Carlo simulations into the valuation of public companies using the discounted cash flow method.
- A practical algorithm has been proposed for identifying key risk variables through sensitivity analysis and subsequently modeling them using probability distributions.
- A consistent methodology has been proposed for selecting probability distributions depending on the economic nature of different DCF model inputs.

Practical Contributions

- The developed methodology has been successfully tested on two public companies from different industries—Rivian Automotive Inc. and Vera Therapeutics Inc.—confirming its applicability in conditions of high uncertainty.
- It has been demonstrated that simulation-based valuation allows for the construction of confidence intervals around fair value estimates and provides a more objective representation of risk in investment decision-making.

I consider the most significant original contribution of the dissertation to be the development of a comprehensive methodological framework for integrating Monte Carlo simulations into DCF valuation of public companies. The literature review demonstrates that although similar approaches have been discussed in isolated studies, there is a lack of a sufficiently detailed and practically applicable methodology. In this respect, the author's contribution is original and enriches both valuation theory and practice.

5. Assessment of Publications Related to the Dissertation

The doctoral candidate is the sole author of five publications, including one monograph study. The publications are directly related to the dissertation topic and demonstrate the candidate's personal contribution.

6. Citations by Other Authors and Reviews in Academic Publications

No citations by other authors are known.

7. Opinions, Recommendations, and Remarks

The dissertation topic is relevant, clearly defined, and based on sound scientific logic. The main merit of the work is the attempt to move from the traditional DCF model to a probabilistic model through the integration of Monte Carlo simulations in the valuation of highly uncertain public companies.

The dissertation demonstrates:

- Good knowledge of valuation literature;
- A strong connection between theory and practice;
- Real empirical application to public companies;
- A consistent methodological structure.

The dissertation meets the minimum national requirements and the requirements of NBU for obtaining the educational and scientific degree of Doctor (PhD).

The text repeatedly refers to the use of a "new methodology." This claim can only be partially accepted. The proposed framework represents more of a:

- Systematization;
- Standardization;
- Structuring of best practices;

rather than a fundamentally new method.

The steps—Sensitivity Analysis, selection of input variables, selection of distributions, correlations, Monte Carlo simulation, and result analysis—have been well known in the literature on risk analysis, corporate finance, and capital budgeting for decades.

A more defensible formulation would be:

"A systematic methodological framework has been developed for integrating Monte Carlo simulations into DCF valuation of public companies operating under high uncertainty."

I have no other remarks. I recommend that the doctoral candidate expand her publication activity in the future by publishing in journals indexed in Scopus and Web of Science.

The submitted dissertation possesses the required scientific and scientometric indicators. It contains scientific, scientific-applied, and practical results that constitute an original contribution to science and comply with the requirements of the **Academic Staff Development Act of the Republic of Bulgaria** and its implementing regulations. The submitted materials fully satisfy the specific requirements of the NBU Regulations for Academic Staff Development.

This demonstrates that the doctoral candidate is capable of successfully conducting independent scientific research. The dissertation clearly shows her ability to investigate, analyze, systematize, interpret, and present research results in a clear, logical, and precise manner. Her scientific-critical attitude and well-argued personal positions on the issues examined are also evident.

Based on all of the above, I confidently give a positive assessment of the research presented in the dissertation, the abstract, the achieved results, and the contributions, and therefore propose that the esteemed Scientific Jury award the educational and scientific degree **"Doctor" (PhD)** to **Stefani Georgieva Andreeva** in the field of higher education **3. Social, Economic and Legal Sciences**, professional field **3.8 Economics**, doctoral program **Finance, Monetary Circulation, Credit and Insurance**.

06 June 2026
Sofia

Signature:
(Assoc. Prof. K. Assenova, PhD)